

School of Physiotherapy and Exercise Science

**Development, Implementation, and Evaluation of a Sport-Based Life
Skills Program for Young People Recovering from First Episode
Psychosis**

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**This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University**

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the North Metropolitan Health Service- Mental Health- Human Research Ethics Committee (EC00273), approval number 13_2016; and the Curtin University Human Research Ethics Committee (EC00262), approval numbers HRE2017-0070 & HRE2018-0748).

Signature:

Date: 15/11/2019

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Dedication

This thesis is dedicated to my parents- to my mother Charlotte Brooke who always takes a front row seat in support of my goals, and who is the definition of resilience, hard work, and love; and in memory of my father, T. Scott Brooke, who was the ultimate curious soul and eternal learner, generous beyond measure, and always a proud advocate of his girls.

Table of Contents

Declaration	ii
Acknowledgements	iii
Dedication	iv
Table of Contents	v
List of Tables	ix
List of Figures	x
List of Supplementary Materials	11
List of Abbreviations.....	12
Abstract	13
Publications Included as Part of the Hybrid Thesis	16
Chapter 1: General Introduction.....	17
Chapter 2: Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action	24
2.1. Introduction.....	24
2.2. Rationale for and Overview of Methodological Approach	26
2.3. Physical Activity is Important for Psychosis Recovery and Prevention	28
2.3.1. Physical activity is particularly critical for people with severe mental illnesses like psychosis.....	28
2.3.2. Physical activity interventions have been successful with SMI, and, more specifically, FEP populations.....	29
2.3.3. FEP physical activity interventions are typically one dimensional	31
2.4. Life skills are Important for Psychosis Recovery and Prevention	32
2.4.1. What are life skills?	32
2.4.2. Life skills help the multifaceted psychosis recovery process.....	32
2.5. Social connectedness is important for psychosis recovery and prevention.....	33
2.5.1. Psychosis and social isolation.	33
2.5.2. Psychosis, recovery, and social connectedness	34
2.6. Sport is an ideal context in which to integrate physical activity, life skills, and social connectivity.....	35
2.6.1. Sport characteristics and reach.	35
2.6.2. The health benefits (physical, mental and developmental) of sport are widespread.	35

2.6.3. Sport has been used as a platform to teach life skills to vulnerable populations	36
2.6.4. Sport provides a platform for social connectivity	37
2.7. Call to action and development recommendations for sport-based life skills intervention to support FEP recovery	38
2.7.1. Call to action.	38
2.7.2. Early intervention greatly reduces chance of chronic illness	38
2.7.3. Feasibility matters: considering barriers and enablers to participation.	38
2.7.4. Methodological rigour is needed in regard to sport-based life skills interventions	39
2.8. Limitations	40
2.9. Conclusions	40
Chapter 3: A Qualitative Investigation of Perceived Barriers to and Enablers of Sport Participation for Young People With First Episode Psychosis	42
3.1. Introduction	42
3.2. Methods	43
3.2.1. Participants	43
3.2.2. Procedures	43
3.2.3. Data Analysis	47
3.3. Results	47
3.3.1. Need for Sport in FEP	47
3.3.2. Barriers	49
3.3.3. Enablers	52
3.3.4. Program Design	55
3.4. Discussion	59
3.5. Limitations and Future Directions	60
3.6. Conclusion	61
Chapter 4: The Development of a Sport-Based Life Skills Program for Young People with First Episode Psychosis: An Intervention Mapping Approach	63
4.1. Introduction	63
4.2. Methods and Results	65
4.2.1. Step 1: Logic model of the problem	65
4.2.2. Step 2: Program outcomes and objectives, and logic model of change.	70

4.2.3. Step 3: Program design.	72
4.2.4. Step 4: Program production.....	74
4.2.5. Step 5: Program implementation.....	77
4.2.6. Step 6: Evaluation plan.	77
4.3. Discussion	78
4.4. Supplementary Materials	80
Chapter 5: Enhancing Functional Recovery for Young People Recovering from First Episode Psychosis Via Sport-Based Life Skills Training: Outcomes of a Feasibility and Pilot Study	107
5.1. Introduction	107
5.2. Methods.....	107
5.2.1. Research context.....	107
5.2.2. Participants	108
5.2.3. Procedure.....	108
5.2.4. Outcomes.....	112
5.2.5. Analysis	113
5.2.6. Process evaluation.	113
5.3. Results.....	114
5.3.1. Research context and recruitment	115
5.3.2. Attendance and engagement	118
5.3.3. Reported Enablers and Barriers to Recruitment, Attendance, and Engagement	120
5.3.4. Recovery Benefits and Skill Development and Transfer	131
5.3.5. Program modifications and recommendations	140
5.3.6. Process evaluation	141
5.4. Discussion	141
5.5. Supplementary Materials	144
Chapter 6: General Discussion.....	215
6.1. Process and Outcomes.....	215
6.2. Significance and Strengths.....	217
6.3. Limitations	218
6.4. Future Directions.....	219
6.5. Conclusion	221
References	223

Appendix A: Published Article	241
Appendix B: Published Article	253
Appendix C: Copyright Permission	268
Appendix D: Copyright Permission	273
Appendix E: Attribution Statements	278
Appendix F: Ethical Approval	283
Appendix G: Ethical Approval.....	288

List of Tables

Table 2.1. Methods: Search and Analysis Process	26
Table 3.1. Interview Guides for Clinicians and Young People with First Episode Psychosis	44
Table 3.2. Design Recommendations from Participants to Limit Barriers and Strengthen Enablers	55
Table 4.1. Overview of Themes from Qualitative Study Exploring Barriers and Enablers to Sport Participation for Young People with FEP	64
Table 4.2. Overview of Intervention Session Phases, Components, and Aims.....	75
Table 5.1. Domains and Themes Constructed from Thematic Analysis of Participant Interviews	114
Table 5.2. Qualitative Responses from Community Workers (n=5) Regarding the Referring Clients to the Study	116
Table 5.3. Demographic Information of Young Participant	117
Table 5.4. Attendance Records of Young People and Reasons for Absences.....	119

List of Figures

Figure 2.1. Sport-based life skills interventions should be used in first episode psychosis (FEP) recovery	25
Figure 4.1. Logic model of the problem: low functional recovery levels in young people with FEP	68
Figure 4.2. Logic model of change	72
Figure 5.1. Pre and post results for the International Physical Activity Questionnaire (IPAQ) for 3 young participants	136
Figure 5.2. Pre and post results for the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS) for 3 young participants	137
Figure 5.3. Pre and post results for the Recovery Assessment Scale- Domains and Stages (RAS-DS) for 3 young participants	138
Figure 5.4. Results for the Life Skills Scale for Sport (LSSS) for 3 young participants	139

List of Supplementary Materials

Table S4.1. Matrices of Change Objectives, Evidence Based Change Methods, and Practical Application	81
Sport-Based Life Skills Training for Young People with FEP.....	81
Table S4.2. Session 1 Outline.....	93
File S4.1. Wellness Plan	102
File S4.2. Weekly Participant Questionnaire.....	103
File S4.3. Post Intervention Interview Guides	104
Table S5.1. Session Feedback, Reflections and Modifications	144
Table S5.2. Process Evaluation Using the MRC Guidance for Process Evaluation	158
Table S5.3. Process Evaluation Using the Bowen et al.'s (2009) Framework for Feasibility Studies	164
File S5.1. Intervention Session Plans Week 1-6.....	167

List of Abbreviations

AUD	Australian dollar
BMI	Body mass index
BPNSF	Basic Psychological Needs Satisfaction and Frustration
CVD	Cardiovascular disease
ESSA	Exercise and Sports Science Australia
FEP	First episode psychosis
HREC	Human research ethics committee
IM	Intervention mapping
IPAQ	International Physical Activity Questionnaire
LSSS	Life Skills Scale for Sport
MetS	Metabolic Syndrome
MRC	Medical Research Council
PA	Physical Activity
RAS-DS	Recovery Assessment Scale- Domains and Stages
SDT	Self-Determination Theory
SMI	Serious Mental Illness
STORI	Stages of Recovery Instrument
UN	United Nations
WHO	World Health Organisation

Abstract

The mental and physical health benefits of physical activity are well documented (e.g. Rhodes, Janssen, Bredin, Warburton, & Bauman, 2017). Sport, a subset of physical activity that includes elements of specific skills, competition, rules, and patterns (AUSGovernment, 2011), has been highlighted as an avenue for such benefits. Sport can lead to positive youth development (psychological and physical; Holt, 2016), increased mental health (Vella, Swann, Allen, Schweickle, & Magee, 2017), and life skills development (i.e. specific behavioural, cognitive, interpersonal, or intrapersonal skills that are beneficial in other life contexts; Gould & Carson, 2008) in general (Holt, 2016) and vulnerable (Hermens, Super, Verkooijen, & Koelen, 2017) populations. As such, there is reason to expect that sport-based interventions might be beneficial for populations with mental illness. However, although physical activity complements standard treatment to mental illness, and has been shown to reduce depressive and schizophrenic symptoms (Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014; Schuch et al., 2016), the use of traditional sport and/or sport-based life skills interventions in mental illness treatment and/or recovery is limited within the literature. This research program addresses this gap through an exploration of the use of sport-base life skills programming for young people recovering from a first episode of psychosis (FEP).

Young people with FEP were chosen as an ideal population to explore the utility of a sport-based life skills program as a complement to standard mental illness treatment and recovery for several reasons. Cardiometabolic problems, social isolation, stigmatisation, and decreased functionality (social and occupational) accompany psychotic illness, and the literature highlights the importance of early intervention (i.e., following one's FEP) to reduce functional impairment later in life (McGorry et al., 2008). Functional recovery goals within FEP are often supported through targeted means to increase physical activity (e.g., Firth, Cotter, Elliott, French, & Yung, 2015), promote social connectivity (e.g., Alvarez-Jimenez et al., 2013), and build life skills (e.g., Lemos-Giraldez, 2015). Considering the overlap between these goals and the components of sport, sport-based life skills programming presents a unique opportunity to integrate the three in one intervention format.

The overarching goals of this research program were to develop, deliver, and evaluate a sport-based, life skills program for young people recovering from first episode psychosis (FEP). These goals were accomplished in four phases:

Phase 1: Narrative review. The aim of the first phase was to examine the potential use of sport within FEP through a narrative review of literatures on (i) first episode psychosis recovery and (ii) life-skills training through sport that highlighted the conceptual (and limited empirical) links between the two. The review revealed compelling overlap between sport components and FEP recovery goals (i.e., physical activity, life skills development, and social connectivity), resulting in a call to action for the use of sport-base life skills programming within FEP recovery efforts, and empirically grounded intervention design recommendations.

Phase 2: Qualitative study. Phase two consisted of a qualitative study to assess the barriers and enablers to sport participation for young people with FEP. Young people with FEP (n=10; via 1-1 interviews) and their clinicians (n=33; via 1-1 interviews and focus groups) were interviewed to gather knowledge regarding sport participation for this population. Thematic analysis identified themes that highlight the need for sport in FEP recovery, barriers (logistical; psychological), enablers (positive environmental expectations and experiences), and program design (sport program/type; life skills training; application to barriers/enablers). Specific recommendations from the participants for how to limit the barriers and strengthen the enablers are provided.

Phase 3: Intervention mapping. In phase three, an intervention mapping approach underpinned the development of an empirically sound and novel sport-based life skills intervention designed specifically for the needs of young people recovering from FEP. Phase one and two informed the needs assessment portion of this approach, which formed the foundation for relevant logic models, evidence-based program design and change methods, program production, program implementation, and evaluation planning. This systematic process culminated in an evidence-based framework for a feasibility and pilot study.

Phase 4: Pilot and Feasibility study. The final phase consisted of the delivery and evaluation of a sport-based life skills feasibility and pilot intervention for young people recovering from FEP. Seven young people with FEP participated in a six-week multi-sport program designed to foster their functional recovery. In addition, nine support workers from a partnering early psychosis functional recovery service

participated alongside the young people to provide support and feedback. Of the nine support workers, three were peer support workers with a lived experience of psychosis. The primary objectives of this study were to assess the feasibility of a sport-based, life skills program for young people with FEP, and to test specific intervention components and gather information to inform future larger scale interventions. Data used to assess these outcomes included records of session attendance and engagement, records of measurement and feedback engagement, feedback provided during the intervention, post intervention interviews, and facilitator reflections during and post intervention. Feedback was collected during and after the intervention from both young people and support workers via questionnaires and/or interviews. The results were utilised to conduct a process evaluation, which indicated a high degree of acceptability, suggesting that sport-based life skills programming may be a feasible platform for producing recovery benefits, and providing feedback on specific intervention components. Future work should consider further feasibility and pilot studies in this area to build toward a full-scale intervention.

Conclusion

This thesis presents a novel and evidence-based approach to the development, implementation, and evaluation of a sport-based life skills intervention for young people with FEP. This research program is the first to utilise a sport-specific platform, and, more precisely, sport-based life skills training, within FEP recovery efforts. In addition, it is the first to utilise intervention mapping within FEP research. These novel components yielded results that support the notion that sport is an untapped resource within the FEP recovery work, highlight specific beneficial intervention components, suggest feasibility of this line of work, and implore researchers to build upon the foundation created in this thesis.

Publications Included as Part of the Hybrid Thesis

The following list of publications are included as part of this thesis and are included in the Appendices. Relevant copyright permission and attribution statements are also in the Appendices.

Chapter 2 of this thesis has been published (See appendix A);

Brooke, L. E., Lin, A., Ntoumanis, N., & Gucciardi, D. F. (2019). Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action. *Early Intervention in Psychiatry*, *13*, 358-368. doi:10.1111/eip.12720

Chapter 3 of this thesis has been published (See appendix B);

Brooke, L. E., Gucciardi, D. F., Ntoumanis, N., & Lin, A. (2019). Qualitative investigation of perceived barriers to and enablers of sport participation for young people with first episode psychosis. *Early Intervention in Psychiatry*. doi: 10.1111/eip.12854

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Chapter 1: General Introduction

It must be true that every PhD journey is a story; a story tangled with tales of ideas and goals, of challenges and triumphs, of doubts and growth. This PhD is no different, and the story in particular of how the idea for this PhD came together is important in understanding its context. My background is in sport psychology; I was drawn to this field through my fascination of the power of the mind in performance realms. This interest remains, but through this work I came to learn that there is so much more to sport, and the psychology of it, than just optimising performance. Formally, sport has been defined as a subset of physical activity “involving physical exertion and skill as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations and is generally recognised as a sport” (AUSGovernment, 2011, p. 7). Although similar, sport is different than exercise, which is defined as different subset of physical activity that is “planned, structured, and repetitive and has as a final or intermediate objective the improvement of physical fitness” (p.7). However, I have come to learn from both personal experience and the literature that sport is greater than its definition or the sum of its parts. In other words, there are inherent components of sport that make it ripe for opportunities to learn, connect, and grow. It is this notion that motivated the foundation of this PhD.

These opportunities embedded in sport come in part from the weight sport holds within society. Look no further than the 2018 Soccer World Cup, which was watched by over 3.5 billion people; in other words, over half the world (FIFA, 2018). Participation in organised sport is a societal norm for many cultures worldwide, a custom supported by the United Nations (UN), who in 1978 declared access to sport for children a fundamental right (UN, 2014). This right is supported today by the international sport and development organisation, Right to Play, which has close ties to the UN, and offers sport and play to over a million disadvantaged children worldwide (RightToPlay, 2017). Organisations like Right To Play know that sport is about more than simply playing. Sport can be seen as a universal language that has the ability to transcend social, cultural, and political divides (Conrad & White, 2015). It makes sense then that sport has been a vehicle for international peace (e.g., Georgiadis & Syrigos, 2009), as a catalyst for human rights movements (e.g., Donnelly, 2008), a medium to help victims of trauma (e.g., Ravizza, 2008) and

natural disaster (e.g., Kunz, 2009), and as a means by which to integrate refugees and minority groups (e.g., Whitler, Coble, & Jewell, 2016). As Nelson Mandela reminded us, “We can reach far more people through sport than we can through political or educational programmes. In that way, sport is more powerful than politics” (Bailey, 2008, p. 85).

Looking closely at the specific culture surrounding this PhD, we know that Australian society holds great value in sport. As former Australian Prime Minister John Howard described, “there is a very special place in the Australian psyche for sport. It is one of the pillars of the Australian way of life. You don't really understand what makes the Australian nation tick, unless you understand the great affection Australians have for sport.” This point is further illustrated by the fact high number of sportspeople who have been awarded Australian of the Year; “The most striking trend in the history of the Australian of the Year awards has been the high frequency of sporting winners” (Australian of the Year, 2019). Athletes represent 25% of Australian of the Year recipients, indicating that athletes are commended not only for their sporting achievements, but also for their capacity to serve as role-models for the nation (Australian of the Year, 2019). The message is clear - to Australia and the world over - sport matters!

The fact that sport matters plays a pivotal role in this PhD. Understanding that sport is a strong thread in the fabric of humanity is only the starting point. The question remains, how can we use this knowledge to make a difference? The answer may lie in systematically maximising those components of sport that are inherently good. Some researchers have answered this call by looking at how sport can be used to foster positive youth development and life skills in the general population (see Holt, 2016). Others have focused more specifically on how sport can be used to help vulnerable populations cope and thrive, such as through developing life skills that are applicable in contexts outside of sport (see Hermens, Super, Verkooijen, & Koelen, 2017). It is also well documented that the physical and mental health benefits of sport are far reaching, which has been capitalised on in research and practice (e.g., Holt, 2016; Vella, Swann, Allen, Schweickle, & Magee, 2017). Personally, through my experience as an athlete and working with athletes, I have witnessed how sport can instil integral capabilities and beliefs that extend well beyond the sporting arena.

Witnessing first-hand the power of sport to teach valuable life skills, I could not help but wonder how sport-based life skills programming could be utilised in

mental health promotion. Mental health is relevant to us all, including to Australians. Mental illness is prevalent among young Australians, and therefore has economic and social implications for the country. It is estimated that 1 in 5 people (aged 16-85) in Australia are affected by mental illness, and that individuals aged 18-24 have the highest prevalence of mental illness than any other age group contributing to the over AUD 9 billion annual mental health budget (AIHW, 2019). Individuals with mental health problems represent a population who are ideally suited to receive sport-based life skills interventions. It has been documented that physical activity and aerobic exercise are a useful additions to the treatment of a variety of mental health problems, including reducing depressive and schizophrenic symptoms (Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014; Schuch et al., 2016). Additionally, individuals with mental health problems can benefit from life skills training, in which interventions target specific behavioural, cognitive, interpersonal, or intrapersonal skills that are beneficial in other life contexts (e.g., Bradshaw et al., 2012; Curtis et al., 2015; Tungpunkom et al., 2012). What has been studied less is the use of traditional sport and/or sport-based life skills interventions as a complement to the treatment of, and recovery from mental health problems. This paucity of research is surprising considering that the mechanisms of sport mirror the components of successful mental health interventions and the needs of those living with mental health problems. First, at the heart of sport is structure (e.g., rules, judges), skill development, and physical exercise and motor learning. Second, sport participants acquire a variety of life skills, that is, important social, emotional and behavioural skills (e.g., managing emotions, goal setting, and effective communication) that can be applied toward important life contexts like independent living and positive community engagement. Finally, the sporting environment is conducive to developing self-awareness and group social identity. It follows naturally that it would be well advised to explore the potential to use sport-based life skills interventions for people with a mental illness. Herein lies the starting point of this PhD.

In the development of the framework for this PhD, an early challenge arose; targeting individuals with general mental health problems would result in a broad

and heterogenous sample. As such, we¹ sought insight from youth mental health experts regarding a suitable specific population for sport-based life skills programming. It was in these conversations that young people with first episode psychosis (FEP) were raised as a potential population for the focus of this work. An FEP refers to an individual's first experience with a psychotic episode or psychotic symptoms, which commonly first presents in late adolescence/early adulthood (ages 16-25 years). Psychotic symptoms may include confused thinking, delusions, hallucinations, and/or changed feelings/behaviours, and often occur in individuals with schizophrenia, bipolar disorder, or depression. Targeting young people at their first episode of psychotic illness reduces functional (social and occupational) impairment later in life because at this early stage of illness individuals are less removed from the developmental trajectory of their healthy peers, and thus benefit most from early intervention (McGorry, Killackey, & Yung, 2008).

The needs of young people recovering from FEP are well aligned with the components of sport. Following a FEP, cardiometabolic issues, decreased functionality, and social isolation are prevalent. As such, at the heart of functional recovery goals for young people with FEP are efforts to increase physical activity (e.g., Firth et al., 2016 a,b,c), develop life skills (e.g., Lemos-Giraldez, 2015), and enhance social connectivity (e.g., Alvarez-Jimenez et al., 2013). Core components of sport similarly include physical activity, life skills training, and social connection opportunities. As such, I committed to working with young people with FEP as an ideal population for which to develop sport-based life skills programming.

Although sport-based life skills for young people with FEP aligns well in theory, working with this population is not without its challenges. Low engagement levels, low funding within FEP services, and seemingly insurmountable red tape in the ethics process presented early. For pragmatic purposes of the PhD, it was suggested that I go another route (e.g., general mental health population). However, from a research standpoint, the positive feedback from young people with FEP and their clinicians, coupled with the clear need for this work, encouraged me to persevere. Even more, from a personal perspective, I was unable to change course

¹ The use of "we" here and throughout the thesis is to acknowledge the contribution of the supervisory team

without turning over every stone; I was simply too invested. My understanding of psychosis started with facing my own stigma toward severe mental illness. Initially, I was concerned about what it might mean to work with people with psychotic illness; thoughts like “*would I have what it takes?*”, “*would I be safe?*”, and “*how could I connect?*” went through my mind. Given my psychology background and personal moral compass, my reaction is extremely difficult to admit. However, it is unsurprising given that people with psychosis are one of the most stigmatised minority groups within society (Vass et al., 2015). My awareness and understanding of psychosis grew as I poured through the literature and met with young people with psychosis, their families, and their clinicians; as did my empathy, compassion, and genuine desire to support and learn from young people who had experienced psychosis. I found that I could connect with the young people quite well, not just because of my psychology background or understanding of the literature, but mainly because they were just young people, not so different than me, seeking a way to work through the challenges in front of them. There were multiple points during this process that I asked myself how it could be that sport-based programs have not yet been utilised within FEP recovery efforts when it is such a clear match, and the need is so evident. There were also multiple points - whether it be in design, ethics, or recruitment - where I realised why. I realised how easily sport based recovery efforts for FEP could be deemed as simply “too hard”- *too much red tape, too few resources, too many barriers*. However, in these moments, I was also struck with the compelling conviction that dynamic, innovative, and early intervention for young people with psychosis is just *too critical* to ignore sport as a potential recovery opportunity despite the challenges.

This PhD thesis encompasses four papers that chronicle the exploration, development, implementation, and evaluation of a sport-based life skills program for young people with FEP. I first present a narrative review of the literatures on FEP recovery and sport-based life skills training, which concludes with a call to action for sport-based life skills interventions for young people with FEP. Second, I present the results of a qualitative exploration of the barriers and enablers to sport for young people with FEP. Third, I outline the intervention development process using an intervention mapping approach. Lastly, I present the results and evaluation of a sport-based life skills program delivered to young people with FEP. In all, these papers confirm that sport-based programming for young people is challenging to implement,

but the results reveal positive levels of feasibility, acceptability, and recovery benefits, imploring future research in this area.

Note: The following chapter has been published in the journal *Early Intervention in Psychiatry*

Brooke, L. E., Lin, A., Ntoumanis, N., & Gucciardi, D. F. (2019). Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action. *Early Intervention in Psychiatry*, *13*, 358-368. doi:10.1111/eip.12720

Chapter 2: Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action

2.1. Introduction

Targeting intervention to people at their first episode of psychotic illness has been shown to reduce functional (social and occupational) impairment later in life (McGorry et al., 2008). Over the past two decades, clinical services have emphasised early intervention, and evidence suggests that this shift coincides with improved remission rates (Lally et al., 2017). As well as the management of psychotic symptoms and co-morbid psychopathology, early intervention in psychosis includes practices that enable functional recovery. Functional recovery goals are supported in various ways, including integral efforts to: 1) increase physical activity (e.g., Firth, Cotter, Elliott, French, & Yung, 2015), 2) build life skills (e.g., Lemos-Giraldez, 2015), and 3) promote social connectedness (e.g., Alvarez-Jimenez et al., 2013). To date, the majority of intervention work has targeted only one or two of these elements directly. As such, there is a need for an approach in which physical activity, life skills and social connectivity are targeted in a coherent and integrative fashion. The overarching objective of this article is to present sport as an ideal context to assimilate the three.

For the purposes of this paper, it is important to clearly define and distinguish physical activity, sport, and exercise. The three concepts are closely related, yet there are important differences that are relevant in the context of this review. Physical activity has been defined as “any bodily movement produced by skeletal muscles that requires energy expenditure” (WHO, 2017), whereas exercise is “a subset of physical activity that is planned, structured, and repetitive, and has as a final or intermediate objective of the improvement of physical fitness” (AUSGovernment, 2011, p.7). Sport is also a subset of physical activity. Although it bears resemblance to exercise and some people may use sport to meet exercise requirements, not all exercise is sport. Sport is a broad concept that has been defined in various way, but always containing elements of physical activity, organisation, rules, and competition. For example, the Australian Government (2011) defines sport as a type of physical activity “involving physical exertion and skill as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations” (p. 7). As we

will discuss, it is through these embedded structures within sport that enable it to be a platform for engagement in physical activity, social connectivity, and life skills training. In this context, life skills are best defined as cognitive, emotional and behavioural skills learned in one context (e.g., sport) that are transferred to and used effectively in other contexts (e.g., education; Gould & Carson, 2008).

In this paper, we first provide a review of each physical activity, life skills, and social connectivity in regard to psychosis recovery in an aim to outline the relevant background information and to support our later call to action. We then connect sport to each of the three tenets to illustrate the opportunity that sport presents as a tool for functional recovery efforts in first episode psychosis (FEP). We conclude with a call to action for the research and development of sport-based life skills interventions for FEP, and offer empirically-based recommendations. Figure 2.1 illustrates the underpinnings of the argument presented.

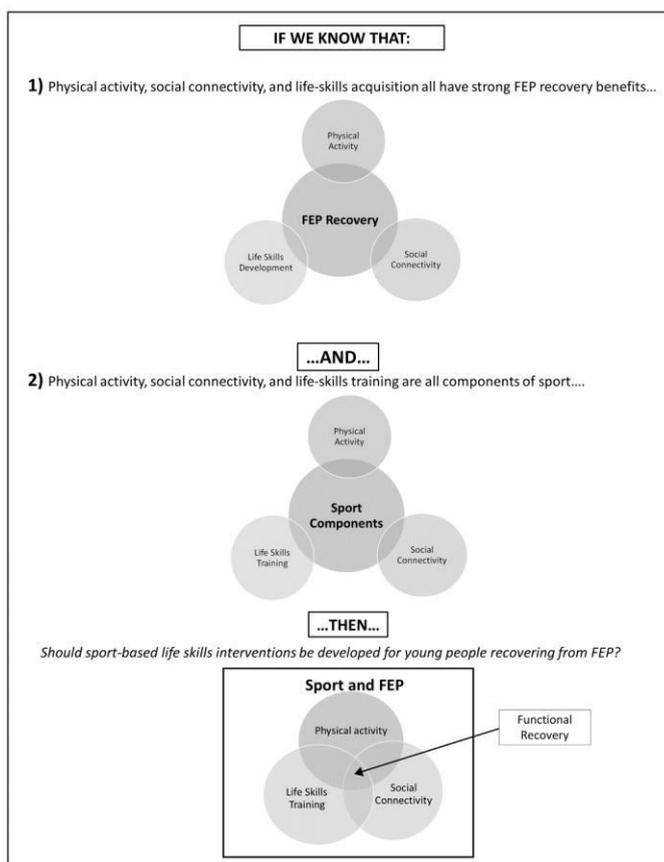


Figure 2.1. Sport-based life skills interventions should be used in first episode psychosis (FEP) recovery.

Note. This figure illustrates the underpinnings of the argument presented in the narrative review.

2.2. Rationale for and Overview of Methodological Approach

The research question evolved organically through discussions pertaining to combined areas of expertise (sport and exercise psychology, health psychology, youth mental health/FEP). Sport was identified as a context and medium through which to teach life skills, which led to the research question about the potential utility of sport engagement to mental health promotion/use with a population who have experienced or are experiencing mental health problems. A preliminary search revealed a paucity of research relating sport-based life skills interventions and mental illness. Upon further discussions and a cursory review of the literature, the notion that sport-based life skills interventions may meet the needs of people recovering from FEP emerged. Feedback was sought from several local FEP clinicians and services in Perth, Australia, who provided support for the need and feasibility of the idea. Subsequently, a narrative review was chosen to determine existing empirical support of the idea. Our approach was informed by previous narrative reviews in which scholars have forwarded a thesis regarding the unrealised potential of certain intervention approaches within the health sector, both within the FEP literature (e.g., friends interventions in psychosis; Harrop, Ellett, Brand, & Lobban, 2015) and beyond (e.g., bike sharing schemes to promote physical activity; Bauman, Crane, Drayton, & Titze, 2017). Our approach has been considered by some scholars (e.g., Grant & Booth, 2009) to be called a critical review, in which a critical lens comparing diverse bodies of work can enable “conceptual innovation” to form a hypothesis, serving as a subsequent “launch pad” for further research (p. 93). A summary of the search and analysis process can be found in Table 2.1.

Table 2.1. *Methods: Search and Analysis Process*

Phase	Description
Review style	<ul style="list-style-type: none"> • Narrative review with a critical approach. • Goal was to review distinct research areas to assess the question: <i>Should sport-based life skills interventions be developed for young people recovering from first episode psychosis?</i>
Search strategy: <i>approach</i>	<ul style="list-style-type: none"> • Deductive approach: psychosis recovery literature was examined through a sport lens, and the sport and life skills literature was examined

	<p>through a psychosis recovery lens. This approach has its benefits in that it allows undiscovered connections to be explored, yet has limitations (e.g., unsystematic exhaustive search, potential bias in selection and interpretation).</p>
Search strategy: <i>process</i>	<ul style="list-style-type: none"> • Broad search of psychosis recovery literature (focus on recent systematic reviews and meta-analyses/syntheses) using terms such as “psychosis recovery”, “psychosis” and “functional recovery” • Broad search of sport and life skills literature (focus on recent systematic reviews and meta-syntheses), using terms such as “sport” AND “life skills”. • Broad search of general sport components (e.g., definition, reach). • Continually and intuitively narrowed search as overlaps emerged, using the basic components of sport (e.g., physical activity, group/social dynamics, and life skills training) as a foundation for the searches (e.g., “physical activity” OR sport OR exercise AND “psychosis recovery”; “social connectivity” AND “psychosis recovery”).
Data Management	<ul style="list-style-type: none"> • All papers of interest were uploaded to NVivo 11 to allow them to be coded as read.
Theme identification/drawing conclusions	<ul style="list-style-type: none"> • Using the sources as “data”, the phases of thematic analysis (Braun & Clark, 2006) were used to manage and deductively analyse sources and minimise bias (i.e., familiarise oneself with data, search for themes, review themes, define and name themes, produce the report). • Papers were coded as they were read to help identify overlapping themes. • Initial themes were both broad (e.g., psychosis recovery in general, life skills transfer within sport; side effects of antipsychotic medication) and narrow (e.g., physical activity and FEP recovery; sport to break stigma; stigma and FEP recovery) in nature. • Themes that did not support the hypothesis (e.g., potential harm of sport, benefits of individual support for FEP, and barriers to engagement) were included, and are discussed in intervention design recommendations

A more systematic approach (e.g., systematic review, meta-analysis, or meta-syntheses) was deemed an inappropriate option for this paper. The overarching goal of this review was to present an argument for sport's potential utility within FEP recovery efforts because sport has not been explored empirically in this population. Instead, we aimed to strike a balance between purposeful selection and systematic coverage of the literature to help us best present a case for this thesis. In other words, we focused on identifying the most significant literature with regard to the aims of our paper, rather than producing a comprehensive search using systematic processes.

2.3. Physical Activity is Important for Psychosis Recovery and Prevention

2.3.1. Physical activity is particularly critical for people with severe mental illnesses like psychosis.

The protective and therapeutic health benefits (e.g., on physical health, cognition, healthy aging) of regular physical activity in the general population are well known. In regard to mental health, recent research has revealed that physical activity may prevent the development of depression (Harvey et al., 2017; Schuch et al., 2018), and well over two decades of research indicates that physical activity is an effective component to the treatment of a variety of mild mental illnesses like depression and anxiety (e.g., Biddle & Mutrie, 2007; Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014). It is clear from this body of work that that physical activity is an accessible and affordable form of treatment that, in some cases, is as effective as psychotherapy (e.g., Paluska & Schwenk, 2000). It can be argued, however, that physical activity's protective health benefits are even more critical for individuals with severe mental illness (SMI). First, individuals with a SMI (i.e., schizophrenia, bipolar disorder, and major depressive disorder) have an increased risk of chronic physical disease, particularly metabolic syndrome (MetS) (Vancamfort et al., 2015) and subsequent cardiovascular disease (CVD), contributing to a significantly higher risk of developing and dying from CVD compared to that of the general population (Correll et al., 2017). Furthermore, studies indicate that the risk of diabetes for individuals with SMI is double that of the general population (Vancamfort et al., 2016), and, more specifically, that an increased risk of diabetes is present in people with FEP who are not being treated with antipsychotic medication (Pillinger, Beck, Stubbs, & Howes, 2017). The mortality rate for people with SMI is

roughly two to three times higher than that of the general population, with their life expectancy shortened by 13-30 years (De Hert et al., 2011).

The effects of SMI on physical health are multi-faceted, but a large contributing factor is the use of anti-psychotic medication. This knowledge is concerning given that antipsychotic medications remain first line treatment of psychotic illnesses. The benefits of antipsychotics come at a high cost – high enough that “in any other scenario, the responsible physician’s response would be to seek an alternative” (Lancet, 2011, p. 611). The side effects of antipsychotics are well-documented and include rapid weight gain, lethargy/sedation, and increased appetite contributing to the high incidence of cardiometabolic problems and diabetes within FEP populations (e.g., Foley & Morley, 2011; Tek et al., 2016). Although there is no difference in these risk factors between the general population and individuals at the onset of psychotic illness (Foley & Morley, 2011), the incidence of metabolic syndrome multiplies by five after only a few years of antipsychotic treatment (De Hert et al., 2011). As such, there has been a stern call for interventions and treatment protocols that counteract the negative effects of using antipsychotic medication in the treatment of psychotic illness, with increased physical activity being a top complementary choice (e.g., iphYs, 2013).

2.3.2. Physical activity interventions have been successful with SMI, and, more specifically, FEP populations.

Numerous studies have shown that for people with SMI, physical activity can improve cardiorespiratory fitness and/or lower BMI to protect against the deleterious health outcome and accompany the diagnoses (e.g., Vancamfort, 2017b; Rosenbaum, Hobson-Powell, Davison, Elliot, & Ward, 2017), alleviate symptoms of mental illness (e.g., Bonsaksen & Lerdal, 2012; Schuch et al., 2016), improve cognitive functioning (e.g., Firth et al., 2016e), enhance social competence and self-reliance (e.g., Soundy et al., 2014), and bolster markers of overall mental health and quality of life (e.g., Firth, Cotter, Elliott, French, & Yung, 2015; Soundy et al., 2014; Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014). Interventions that use sport as a mode of physical activity for people with SMI have reported functional recovery and quality of life benefits such as a sense of achievement, purpose, and belonging; positive sense of identity and enhanced confidence; and positive social experiences (e.g., Carless & Douglas, 2016; Soundy et. al, 2015).

In recent years, there has been a growing amount of promising research on exercise-based early interventions specifically for the treatment and recovery of psychosis. The early stages of psychosis, particularly the time following a FEP, is considered a critical time in which the detrimental trajectory of the psychological and physical effects of psychosis could be altered (Hughes et al., 2014). Researchers have demonstrated that exercise for people with FEP can be successful in limiting antipsychotic induced weight gain (Curtis et al., 2016), and increasing aerobic fitness (Rosenbaum, Watkins, et al., 2015), both strong markers of metabolic syndrome prevention and psychosocial recovery. Alongside the physical health benefits, exercise interventions reduce psychotic symptoms (Firth, Carney, Jerome, et al., 2016c) and improve cognitive dysfunction (Firth et al., 2015), provide a welcomed distraction to psychotic symptoms such as hearing voices (Alexandratos et al., 2012), ease the stigma of mental illness through engagement in a normalised activity (Ellis, Crone, Davey, & Grogan, 2007), provide opportunities for interactive social engagement (Carless & Douglas, 2008), offer a sense of purpose and control (Alexandratos et al., 2012), and lead to less use of inpatient mental health services (Korge & Nunan, 2017). Importantly, there is evidence to suggest that physical activity interventions are feasible and may lead to sustained levels of physical activity post intervention (Firth, Carney, French, Elliott, & Yung, 2016b), and that cardiorespiratory fitness may protect against future psychosis (Kunutsor, Laukkanen, & Laukkanen, 2018).

The research supports the importance of regular physical activity for the physical and mental health of people with SMI and psychosis. However, despite these findings, people with SMI (Stubbs et al., 2016a; Vancamfort et al., 2017a) and, more specifically, FEP (Stubbs et al., 2016b), report levels of physical activity well under the World Health Organisation recommendations (WHO, 2017), and well below the general population. Furthermore, these groups report significantly higher levels of sedentary behaviour when compared to healthy controls (Vancamfort et al., 2017a; Stubbs et al., 2016c). Considering that both low levels of physical activity (WHO, 2017) and high levels of sedentary behaviour (e.g., Patterson et al., 2018) are independent risk factors of CVD in the general population, the combination only exasperates existing or future cardiometabolic problems in SMI or FEP, and makes proactive health behaviour less likely or possible (Vancamfort et al., 2017a). As such, it is unsurprising that reported levels of cardiorespiratory fitness in people with SMI

are significantly lower than those of healthy controls (Vancamfort et al., 2017b). The inherent conundrum is that the increased need for physical activity within this population is coupled with increased barriers to exercise (e.g., weight gain makes exercise more critical, but also more daunting; Rubinstein & Breitborde, 2016). These findings highlight the need for continued and evolved physical activity interventions for people with psychotic illness that are both effective and engaging.

2.3.3. FEP physical activity interventions are typically one dimensional.

Exercise interventions show success in fostering both mental and physical health, but, for the most part, they do so through the one-dimensional focus on *individual* physical exercise. To date, FEP exercise interventions tend to be individually-focused and only provide exercise instruction, perhaps missing ripe opportunities for further functional recovery and social connectivity; both of which are critical components of psychosis recovery and prevention (McGorry & Goldstone, 2016). There are exceptions to this unidimensional focus on physical exercise, however, the impact on functional recovery or social functioning is generally unmeasured, or the additional components are not prominent in the intervention. For example, Curtis and colleagues (2016) found that an exercise intervention that had additional life skills/lifestyle intervention components (e.g., cooking classes and goal-setting) was successful in attenuating anti-psychotic weight gain in FEP, although they did not measure other components of recovery. Firth and colleagues (2016a) included group sport or exercise as an option in an FEP exercise intervention that measured various markers of recovery, but this group element was minimal overall (i.e. less than 10% of all recorded sessions).

Given that early psychosis services are reliant on funding that is often scarce, there is a need to explore multi-dimensional group-based physical activity interventions that have the potential to offer ‘more bang for the buck’. Along the same lines, given that individuals with FEP tend to find it challenging to engage in interventions because of symptoms and other illness-related factors (e.g., increased anxiety, decreased motivation, social stigma; Firth, Rosenbaum, Stubbs, Gorczyński, et al., 2016; McCarthy-Jones, Marriott, Knowles, Rowse, & Thompson, 2013), there is a need to find ways to maximise the time that they engage with physical activity-focused programs. One possibility in this regard is to embed life skills training within physical activity interventions, with the acquisition and transfer of life skills as a primary outcome.

2.4. Life skills are Important for Psychosis Recovery and Prevention

2.4.1. What are life skills?

Broadly speaking, life skills can be defined as “those skills that enable individuals to succeed in the different environments in which they live, such as school, home and in their neighbourhoods. Life skills can be behavioural (communicating effectively) or cognitive (making effective decisions); interpersonal (being assertive) or intrapersonal (setting goals)” (Danish, Forneris, Hodge, & Heke, 2004, p.40). Life skills training occurs when these skills are learned in one context (e.g., sport) and successfully applied in another (e.g., education) (Gould & Carson, 2008). Life skills training aims to foster elements that promote positive health, not just target symptoms of ill-health. This focus is in line with the WHO definition of health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2017a, para. 1) and mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community” (para. 2). These definitions are strikingly similar to that of functional recovery within FEP.

2.4.2. Life skills help the multifaceted psychosis recovery process.

It could be argued that life skills acquisition is at the crux of psychosis recovery, and embedded into functional recovery efforts. A core measure of recovery from psychosis is functional recovery, despite recurring symptoms (McGorry & Goldstone, 2016). One is said to have achieved a level of functional recovery post-psychotic episode when they regain the ability to live and function in an independent and meaningful way (Hughes et al., 2014). Functional recovery is fostered through a focus on the subjective and personal markers of recovery (e.g., changes in goals, feelings, and values; Morera, Pratt, and Bucci 2016) and opportunities for social, personal, vocational, and educational growth (e.g., Shepherd, 2016; Hughes, 2014). Someone who has achieved a level of functional recovery will demonstrate self-management of the illness (e.g., noticing and managing triggers; e.g., Lemos-Giraldez et al., 2014) and a growth-focused perspective (e.g., working toward goals), and will express feelings such as hope, optimism, self-belief, and control (Shepherd, 2016; Morera, Pratt, & Bucci, 2016). Both clinicians (Morera, Pratt, & Bucci, 2017) and patients (Pitt, Kilbride, Nothard, Welford, & Morrison, 2007) have rated targets of functional recovery as more important than symptom remission. Functional

recovery is supported through development of the emotional, cognitive, and behavioural skills targeted within life skills training. If we bring our attention back to the definition of life skills training, one could argue that functional recovery and life skills training are essentially different terms for nearly the same concept. This is evidenced, in, for example, Lemos-Giraldez and colleagues' (2015) recovery measure, the Stages of Recovery Instrument (STORI), which illustrates the notion that psychosis recovery is a process that leads to a satisfying life, rather than a binary (symptoms present or not) biomedical outcome, and includes indices of goal setting, self-awareness, confidence, control, and optimism. In essence, the psychosis recovery literature uses life skills as indicators of functional recovery; such life skills can be trained and transferred to other contexts. This overlap warrants research into psychosis recovery interventions that contain clear components of life skills training, and encourage transfer of these skills to other areas of life. Interventions utilising physical activity for SMI (e.g., Soundy 2014) and, more specifically, FEP (e.g., Firth et al., 2016) show encouraging results for the potential for physical activity (including sport) to be used to foster life skills training within this population. However, as previously discussed, much of this work is one-dimensional in that it only utilises individual exercise, and functional recovery markers tend to be secondary research outcomes to objective markers of primary outcomes like symptomatology and BMI. Sport may be one option to embed life skills training within FEP interventions and promote functional recovery through creating opportunities for social connectedness.

2.5. Social connectedness is important for psychosis recovery and prevention

2.5.1. Psychosis and social isolation.

Psychosis leads to social isolation and withdrawal for various reasons, including: 1) effects of both positive and negative symptoms, 2) effects of antipsychotic medication, and 3) the stigma surrounding mental illness, and, more specifically, psychotic illness. Firstly, the symptoms of psychosis (e.g., paranoia) and comorbid psychopathology (such as social anxiety) can threaten social relationships and connection (Mancuso, Horan, Kern, & Green, 2011; McCarthy-Jones et al., 2013). Furthermore, negative symptoms are predictors of poor social recovery and functioning (e.g., symptoms such as lethargy, avolition, and apathy make engaging in social interactions daunting), whereas negative symptoms such as inappropriate

emotional responses and impaired attention may make social attempts unsuccessful (Gee et al., 2016; Schlosser et al., 2015). Secondly, the side effects of antipsychotic medication are profound. Significant weight gain is common, leading to shame and embarrassment that encourages withdrawal from social relationships (McCarthy-Jones et al., 2013; Tek et al., 2016). Lastly, the stigma surrounding mental illness cannot be underestimated. Research indicates that people who experience psychosis are one of the most stigmatised minority groups within society, and that most of the general population hold negative perceptions about people with psychosis (Vass et al., 2015). People with a psychotic illness are more likely to experience ostracism and bullying, which exacerbates the social divide (Harrop, Ellett, Brand, & Lobban, 2015). As psychosis normally develops between adolescence and young adulthood – a time where most young people are attempting to establish themselves as an independent adult – such severe social disruptions at this critical age in development are concerning, and extra care must be taken to promote functional recovery (Harrop et al., 2015; McGorry & Goldstone, 2016).

2.5.2. Psychosis, recovery, and social connectedness.

Social isolation that accompanies psychosis has detrimental effects on the individual and their recovery trajectory, and prohibits them from experiencing the well-documented benefits of social connectedness. It has been demonstrated that social engagement and social support are critical components of functional recovery following a psychotic episode. A meta-synthesis of qualitative studies exploring the experience of psychosis found that functional recovery comes largely through nonjudgmental support of family and friends, connections with others with a shared experience, and restoring severed relationships (McCarthy-Jones et al., 2013). In an examination of the quality and frequency of social interactions during clinical recovery of FEP, researchers found frequency of interactions with friends (but not the quality of such interactions) to be a significant indicator of clinical recovery (Bjornestad et al., 2017). This finding is promising as it suggests that even surface level interactions could aid in recovery, calling for further research that promotes social interaction. This finding echoes a “call to action” made earlier by Harrop and colleagues (2015) in which they presented a wealth of evidence to support the need for “friends interventions” for young people with psychosis. The need to counteract the tendency toward isolation and the benefits of social connectedness are clear - what is needed are more interventions specifically addressing these needs in people

with early psychosis, and sport may be an optimal avenue. Physical activity interventions for SMI show promising effects on social components of recovery, including enhanced social competence (e.g., Soundy et al., 2014), and suggest that sport can provide positive relational experiences (Carless & Douglas, 2016) and critical opportunities to give and receive social support (Soundy et al., 2015). More specifically, in regard to FEP, researchers have demonstrated that physical activity can promote psychosocial functioning (e.g., Firth et al., 2016a; Firth et al., 2016b; Firth et al., 2016c), yet the use of sport for FEP has been explored in only a limited manner.

2.6. Sport is an ideal context in which to integrate physical activity, life skills, and social connectivity

2.6.1. Sport characteristics and reach.

Sport is far bigger than the sum of its components within society. Major sporting events draw massive following, and participation in organised sport is a societal norm for many cultures across the globe. In 1978, the United Nations (UN) declared access to sport for children a fundamental right, not a privilege (UN, 2014). The weight of sport's cultural value is profound - sport has been described as a "global language," and as having the power to transcend social, cultural, and political divides (Conrad & White, 2015). As such, sport has been used as a medium to promote international peace (e.g., Georgiadis & Syrigos, 2009), help trauma victims (e.g., Ravizza, 2008), support victims of natural disaster (e.g., Kunz, 2009), lead human rights moments (e.g., Donnelly, 2008), and teach valuable life skills to socially vulnerable youth (e.g., Hermens, Super, Verkooijen, & Koelen, 2017). Perhaps Nelson Mandela said it best when he noted, "We can reach far more people through sport than we can through political or educational programmes. In that way, sport is more powerful than politics" (Bailey, 2008, p. 85). The reach of sport is especially important in regard to FEP recovery when the previously discussed stigmatising properties of psychotic illness are considered (e.g., Wood et al., 2017). Beyond its potential to be a uniting force, sport also offers many health benefits.

2.6.2. The health benefits (physical, mental and developmental) of sport are widespread.

Sport provides an engaging and accessible environment to develop positive habits that contribute to healthy and productive living. A core component of sport is

physical activity, the health (physical and mental) benefits of which are immense for mental illness and FEP. Beyond the physical activity, the structure (e.g., rules routine, discipline, feedback, social camaraderie, positive role models, mentorship) of sport yields a context ripe for developmental benefits. The effects of sport on development have been examined, with particular emphasis on positive youth development. Participation in sport can support the healthy growth of young people, including physical health benefits (e.g., healthy weight maintenance, enhanced cardio-respiratory functioning, decreased risk of diabetes and heart disease), psychosocial well-being (e.g. leadership development, enhanced self-esteem, enhanced academic performance), mental health benefits (e.g., fewer symptoms of depression, less drug use, and less incidence of suicidal behaviour) and physical developmental gains (e.g., increased motor skills) in its participants (e.g., Agans, Ettekal, Erickson, & Lerner, 2016; Holt, 2016; Vella, Swann, Allen, Schweickle, & Magee, 2017). Sport participants acquire a variety of important social, emotional and behavioural life skills (e.g., managing emotions, goal setting, and effective communication) that can be transferred and applied to important life contexts, such as independent living and positive community engagement (Gould & Carson, 2008). There is evidence that long-term participation in organised sport can sustain these benefits (Hermens, Super, Verkooijen, & Koelen, 2017; Holt, 2016). As such, there has been extensive effort into using sport as a framework and intervention context to promote the positive development of youth, in both healthy and vulnerable populations.

2.6.3. Sport has been used as a platform to teach life skills to vulnerable populations.

We have already presented evidence to support the importance of life skills in FEP recovery, and argued that the goal of functional recovery in FEP shares essential components with life skills training. Our proposal that sport may be a platform to teach life skills to people with FEP is supported by the existing evidence that demonstrates that the sporting environment can be a powerful teaching context, and this capacity has been capitalised by using sport to teach life skills to socially vulnerable youth. A recent systematic review of such literature indicates that the utility of this work is broad (Hermens et al., 2017). Multiple populations have been targeted (e.g., low socioeconomic background, delinquent, minority, immigrant), with a variety of intervention approaches (e.g., school-based, summer camp, after school), sports, (e.g., mixed sport, basketball, swimming, football), and life skills

training methods (e.g., mentor training, leadership training, social skills instruction, critical thinking sessions) utilised. This work commonly uses interviewing and pre/post-test quantitative methods (rarely including a control group) to assess a variety of targeted emotional life skills (e.g., mood improvement, self-worth), cognitive life skills (e.g., self-confidence, motivation), and social life skills (e.g., communication, conflict resolution). Although there is room for enhanced methodological rigour within this body of research, overall, the existing evidence suggests that sport programs can be used as a platform to teach life skills to socially vulnerable youth. This preliminary evidence inspires further work, including application to other socially vulnerable populations, such as people with SMI.

2.6.4. Sport provides a platform for social connectivity.

We previously presented evidence describing the challenges people with FEP face in regard to social isolation, and the need for social interaction for recovery. Sport offers an avenue to meet this need. Social connectivity is a key benefit of participation in organised sport. Sport creates opportunities for social relationships to flourish (e.g., through an inbuilt community), has the potential to nurture critical social skills (e.g., through role models and communication training) and support the development of one's social identity (e.g., through leadership development and belonging to a community; Conrad & White, 2015). Unsurprisingly, therefore, youth sport participants report greater levels of confidence in social settings and greater satisfaction with their social environment, compared to their peers uninvolved in sport (Holt, 2016). The positive effects of sport participation for social connectivity extend beyond the general population. For example, socially vulnerable youth (e.g., from low socio-economic backgrounds) have demonstrated stronger social connections and life skills following a sport-based participation program (Hermens et al., 2017). Sport programs for individuals with SMI have been shown to help provide a positive sense of identity and purpose, increased social confidence, and an enjoyable social experience to look forward to (Soundy et al., 2015). With sport participation comes the opportunity to engage in a normalised activity, which can help ameliorate the negative stigma of mental illness that is so crippling to relationships (Conrad & White, 2015; Soundy et al., 2015). For these reasons, sport represents an ideal context in which to foster and sustain a sense of social connection with others.

2.7. Call to action and development recommendations for sport-based life skills intervention to support FEP recovery

2.7.1. Call to action.

Thus far, we have discussed the benefits of physical activity, life skills training, and social connectivity for the general population. We presented evidence to suggest that these three components are fundamentally important for people with SMI, and, more specifically, individuals with a FEP; the evidence suggests that the degree of recovery from psychosis may hinge on these three components. Because the fundamental components of sport include physical activity, social connectivity, and the potential for life skills development, we contend that sport-based life skills interventions designed specifically for people with FEP could aid in the recovery process. In the following sections, we detail three key elements to consider for the development of such interventions.

2.7.2. Early intervention greatly reduces chance of chronic illness.

Targeting people at their first episode of psychotic illness has been shown to reduce functional (social and occupational) impairment later in life. The effectiveness of early intervention is explained by at least four factors: 1) the years immediately following onset of psychosis are considered a critical period in the sense that individuals are most vulnerable to relapse (Hughes et al., 2014); 2) onset generally occurs at an especially sensitive developmental time, and at this early stage of illness individuals are less removed from the developmental trajectory of their healthy peers, and thus benefit most from early intervention (McGorry et al., 2008); 3) individuals are more likely and able to engage in help-seeking behaviour at this early stage, before the side-effects worsen (Hughes et al., 2014); and 4) people who are younger and less burdened by cardio-metabolic diseases are at a more optimal age to engage in and create physical activity habits (Firth, Carney, Elliott, et al., 2016a). In addition to these social and health benefits, early intervention is more cost effective; specifically, it is estimated that specialised early-intervention psychosis programs can offer greater recovery rates at one third the cost of standard care (Mihalopoulos, Harris, Henry, Harrigan, & McGorry, 2009).

2.7.3. Feasibility matters: considering barriers and enablers to participation.

It is important that intervention designs account for the barriers and enablers to sport participation for people with FEP. Physical activity interventions for people

with SMI have historically low recruitment and retention rates. Scholars urge that for people with FEP, it is critical that interventions offer personalisation for the intervention, even in group settings (e.g., offering varying options or supporting individual goal setting; e.g., Curtis et al., 2016; Firth et al., 2016a). Although it is important to cater to the individual, adherence can be maximised through a combination of group and individual work (Ward, White, & Druss, 2015). In a recent qualitative exploration of the effects and determinants of exercise participation in people with FEP, Firth and colleagues (2016c) found both autonomy (e.g., choosing the activity) and social support (e.g., having an exercise buddy) to be critical factors in engaging participants; in contrast, anxiety and lack of motivation were key barriers. In a subsequent survey study, Firth et al. (2016d) found that increased fitness/energy, distraction, and gaining confidence were the strongest motivating factors. Motivating factors are important, as they need to be prominent enough to override the psychosocial vulnerabilities created by both positive and negative symptoms that can make engagement challenging (Soundy et al., 2014). More broadly, the stigma of mental illness must be kept in mind such that interventions should include normalising components (e.g., marketing materials and attire of program facilitators that lessen the feeling of being “other” for the participants; see Gronholm, Thornicroft, Laurens, & Evans-Lacko, 2017). Considering the novelty of this call to action, it would be valuable to explore the feasibility of a sport based-life skills intervention specifically for young people with FEP via general perceptions of such a program, its preliminary effects, and the perceived barriers and enablers to engagement.

2.7.4. Methodological rigour is needed in regard to sport-based life skills interventions.

One must be cautious of this common “sport evangelist” mindset. This mindset is the tendency within the field to “blindly believe that sport participation inevitably contributes to youth development because sport’s assumed essential goodness and purity is passed on to those who partake in it” (Coakley, 2011, p. 306). It is easy to fall into the trap of assuming that life skills will naturally be acquired and transferred to other domains through sport participation with little systematic effort, despite evidence on the contrary (Pierce, Gould, & Camire, 2017). One must be aware that sport also has the capacity to do harm (e.g., through exclusion or comparison to more successful peers; Conrad & White, 2015), and be mindful of the

intervention design and processes to utilise and maximise the benefits of sport. The use of people with sport expertise and an understanding of relevant theory to develop and facilitate the work may support this effort. As with any intervention program, clarity and detail is imperative in regard to program components, life skills definition, life-skill measurement, and mechanisms of life-skill transfer (Pierce et al., 2017). Key considerations for life skills training are the notions of training and transferability; that is, life skills are developed in one context and then applied effectively in another domain, demonstrating the interactive nature of development. It is important to note that the transfer of life skills across contexts doesn't just happen automatically, but is maximised via systematic attempts to create an environment that promotes transfer, including (i) similarity of context, (ii) opportunities to use skills, (iii) support for transfer, and (iv) rewards for transfer (Pierce, Gould, & Camire, 2017).

2.8. Limitations

This review is not without its limitations. The narrative review approach taken allowed for the amalgamation of separate research areas to highlight a gap in the research and clinical care practices. However, because our focus was on evidence that was relevant to our thesis, the unsystematic nature of our search meant that we may have missed important studies and/or been biased in selection and interpretation. Efforts to eliminate such bias included reflective team discussions. Furthermore, study quality was unassessed and therefore excluded from the synthesis of information.

2.9. Conclusions

The conceptual and empirical evidence presented in this paper highlights the potential for sport-based life skills interventions to be a powerful tool in the recovery of FEP, and the prevention of future relapse. We discussed recovery post-FEP as a complex process with two main goals: 1) minimise symptoms and 2) enable functional recovery. We have demonstrated that these two goals are supported by physical activity, life skills acquisition, and social connectivity. Against this conceptual backdrop, we argued that sport is an ideal platform to integrate these three components. As such, we provided a call to action that sport-based life skills interventions should be developed for those recovering from FEP and suggestions for intervention design.

Note: The following chapter has been published in the journal *Early Intervention in Psychiatry*

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Chapter 3: A Qualitative Investigation of Perceived Barriers to and Enablers of Sport Participation for Young People With First Episode Psychosis

3.1. Introduction

It is well documented that early intervention following an individual's first episode of psychosis (FEP) is critical to reduce long term negative impact on functioning, health, and well-being (e.g., Santesteban-Echarri et al., 2017). In conjunction with symptom reduction, the predominant treatment goal post-FEP is increased functional recovery levels. Some integral components of functional recovery include: (a) physical activity (PA) to promote mental health and well-being (Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014; Schuch et al., 2018), and combat the cardiometabolic problems associated with psychotic illness and medication (Correll et al., 2017; Vancampfort et al., 2015); (b) social connectivity in an effort to target the ill-effects of social isolation associated with FEP (Gee et al., 2016; McCarthy-Jones et al., 2013); and (c) life skills development to support an individual's ability to cope and thrive after experiencing a FEP at a critical time in psychosocial development (McGorry & Goldstone, 2016).

Published interventions that combine PA, social connectivity, and life skills development for FEP are scarce. Sport has been forwarded as a useful intervention platform from which to combine these three components (Brooke, Lin, Ntoumanis, & Gucciardi, 2019 [chapter 2]). First, sport is a type of PA "involving physical exertion and skill as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations" (Commonwealth of Australia, 2011, p. 7). Although related, sport is different to exercise, which is "a subset of physical activity that is planned, structured, and repetitive, and has as a final or intermediate objective of the improvement of physical fitness" (p.7). The difference between sport and exercise is critical for the understanding of the context of this paper. It is through the structures embedded within sport (e.g., rules, competition, organisation, community) that sport is able to provide opportunities for more than just physical activity, as the next two points will illustrate. Second, it is well documented that sport has the capacity to promote social connectivity and bring people from varying backgrounds together, transcending social, cultural, and political divides (Conrad & White, 2015). Lastly, sport has been shown to be a useful platform from which to teach essential life skills

(e.g., confidence, communication, emotional regulation) to vulnerable populations (Hermens, Super, Verkooijen, & Koelen, 2017). Life skills in this context are defined as cognitive, emotional and behavioural skills that can be learned in one context (for example, through sport) and transferred to and used effectively in other contexts (such as education; Gould & Carson, 2008).

Given the documented need for dynamic early-intervention approaches (Santesteban-Echarri et al., 2017), combined with the call for more PA based interventions for people with FEP (iPHYS, 2013) and a recent call to action for further exploration into the use of sport within psychosis recovery (Brooke et al., 2019b [chapter 2]), we sought to develop a sport-based life skills intervention for young people recovering from FEP. As a starting point, an intervention mapping approach was employed (Bartholomew Eldredge et al., 2016). Part of the first step of intervention mapping is conducting a needs assessment to understand the problem (in this case, limited functional recovery post-FEP), the community (mental health services), and relevant stakeholders (young people with FEP and their families, and clinicians). To this end, we conducted interviews and focus groups with young people with FEP and their clinicians to gather information on the barriers and enablers to sport participation for young people with FEP.

3.2. Methods

3.2.1. Participants.

Participants were young people with a recent FEP receiving treatment from one of six local early intervention psychosis services within the wider Perth region. Recruitment was conducted through the clinical care teams at the services, and the services were asked to refer only young people who were stable enough in their symptomatology to participate. Inclusion criteria for young people were (a) between 16 and 25 years of age, and (b) had experienced a FEP within the past three years, and (c) who were referred to the researchers for the interview by their clinical care team. Clinicians from the same early intervention services working with young people with FEP were also recruited for interviews and/or focus groups. Rolling recruitment occurred over a period of 10 months until a sufficient level of data saturation was reached (O'Reilly & Parker, 2013).

3.2.2. Procedures.

We selected a semi-structured format for the focus-group and individual interviews for its ability to collect in-depth information, while encouraging participants to describe their own specific experiences, perceptions, and expertise (Sparkes & Smith, 2014). In the interviews with young people, participants' beliefs, motivations, and attitudes towards sport and sport-based programming were explored. Questions focused on barriers and facilitators (intrapersonal, interpersonal, psychological, environment, health/safety, logistical) to sport participation. Focus groups and interview questions for clinicians related to their views on the barriers and enablers to sport participation for their clients, sport intervention design, and recruitment suggestions. In all focus groups and interviews, an iterative approach was taken in which the interview guide evolved as interviews progressed, informing new initial and follow-up questions as the researcher's understanding of the local psychosis population's needs and resources expanded. For example, a point raised in one interview would be addressed in another even if it did not arise during the conversation organically, with an effort to ask the question in a non-leading manner (e.g., "Other young people have expressed that having their clinician present at the sport program would be helpful, whereas some have said that they would prefer that they not attend. What are your thoughts on this?"). The interview guide is detailed in Table 3.1. All interviews and focus groups lasted 30-60 minutes, and participants received a \$25AUD voucher for each session they attended as a reimbursement for time and travel expenses. Ethics approval for the study was obtained from the Western Australia Department of Health and Curtin University.

Table 3.1. *Interview Guides for Clinicians and Young People with First Episode Psychosis*

Participant Type	Sample Interview Questions
Clinician	<ul style="list-style-type: none"> • What is your reaction to the idea of a sport programme designed to aid in the treatment and prevention of psychosis? • Have you heard of any similar programmes?(if yes, ask them to elaborate about their experience) • Would you be interested in recommending your clients to participate in such a programme? (Why or why not?)

	<ul style="list-style-type: none"> • What would make participation challenging for your clients? <ul style="list-style-type: none"> - What barriers to sport participation would be unique to an FEP population? - What barriers to retention in such a programme would be unique to an FEP population? - Follow up with questions about cognitive, emotional, physical, and environmental barriers. - Follow up with questions about timing, transportation, and other logistical issues to be considered. • What psychological and/or emotional symptoms would deem an individual unfit for such a programme? • What ethical issues must we take into account? • What psychological safety issues must we take into account with a sport-based programme for young people with FEP? • What would you foresee being the potential risks of participation? <ul style="list-style-type: none"> - How can we limit these risks? - What actions can we take to mitigate harm? • What would help enable participation for your clients? • What steps can we take to encourage programme retention? • What sports would your clients be interested in playing? <ul style="list-style-type: none"> - Would your clients be more interested in individual or team sports? Why? • Would your clients be comfortable with playing sport with those of a different gender? • What would be the best way to advertise such a programme? • What psychological measurements would be relevant to consider using to evaluate the effectiveness of a sport-based life skills program with an FEP population? • Are there any other considerations we should be aware of when designing such a programme?
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<p>Young People with First Episode Psychosis</p>	<ul style="list-style-type: none"> • What role does sport play in your life? <ul style="list-style-type: none"> - What is your previous experience with sport? - Do you currently play any sports? - Are you a fan of any sport teams/athletes? - Do you enjoy any sports recreationally? - Are you physically active in other ways? - How has your involvement in sport/physical activity changed following their experience with a psychotic episode? • What is your reaction to the idea of a sport programme designed to aid in the treatment and prevention of psychosis? • Have you heard of or participated in any similar programmes? <ul style="list-style-type: none"> - (if yes, ask them to elaborate about their experience) • Would you be interested in participating in a sport-based programme to help young people develop skills that can be transferred to other areas of their life? (Why or why not?) • What would make you more/less interested in participating? <ul style="list-style-type: none"> - Follow up with questions about timing, transportation, and other logistics. • What would make it challenging for you to participate? (follow up with questions regarding logistical, psychological, social, etc, barriers) • What make it easier for you to participate? (follow up with questions regarding logistical, psychological, social, etc, barriers) • What would make you feel safe to participate (psychologically and otherwise)? • What sports would you be interested in playing? • Would you be more interested in individual or team sports? Why? • Would you be interested in playing with those of a different gender? • Sport can be a great platform to learn life skills like motivation, goal-setting, emotional regulation, etc- what are your thoughts on a sport program that is designed to teach these skills as part of the recovery process? • What would be the best way to advertise such a program? • Is there anything else that you would like to add?
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Note. Consent was obtained before beginning the interviews. With the young people, time was spent at the beginning of the interview to build rapport through friendly chat. The questions in this table only serve as a guide; probing follow up questions were asked where relevant, and questions informed from previous interviews were added where appropriate.

3.2.3. Data Analysis.

All interviews were transcribed verbatim, input into NVivo data management software (version 11; QSR, 2010), and analysed by the first author using thematic analysis. Thematic analysis was used because of its ability to generate key patterns in a way that is flexible and accessible (Braun, Clarke, & Weate, 2016). The data was analysed in a six-step iterative process, as outlined by Braun and colleagues. 1) familiarisation with data, 2) initial code generation, 3) theme search, 4) theme review, 5) theme definition and naming, and 6) report production. First, the analyst – who has previous experience with thematic analysis – immersed themselves in the data by reviewing it empathetically and taking rough notes. Next, meaningful data segments were coded systematically and codes were collated and then organised into initial themes, allowing the data rather than the research questions to drive the process. These themes were then reviewed and compared against the transcripts and the original codes. At this stage, it was verified that the themes and sub-themes were endorsed by a majority of the participants, and were refined accordingly. Next, the themes were named and defined. Throughout the coding, theme generation, and theme naming/refining stages, group discussions amongst the research group provided clarification via the challenging of ideas or interpretations. Young people and support worker data were analysed separately, and themes were combined where appropriate.

3.3. Results

Ten young people (Mage = 21.0, 90% male, 75% live in family home, 90% completed final year of schooling, 100% Caucasian, 75% employed at least part time) and 33 clinicians (five focus groups of 5-8 people; seven 1-1 interviews) took part in this study. Four themes and eleven sub-themes relevant to program design and implementation were identified from the analyses. Data across both the clinician and client groups were similar, thus we report themes together, with relevant group differences noted. The themes (and corresponding sub-themes) were: 1) need for sport in FEP (perceived benefits; resource gap); 2) barriers (logistical; psychological); 3) enablers (positive environmental expectations and experiences); and 4) program design (sport program/type; life skills training; application to barriers/enablers).

3.3.1. Need for Sport in FEP.

All participants expressed support for a sport program to promote recovery in young people with FEP.

3.3.1.1. Perceived benefits.

Participants discussed the potential benefits of a sport program for young people with FEP. Young people expressed that they would be drawn to such a program predominantly for fun, opportunities for building connections with others, and fitness/health. Participants indicated that a fun environment would provide a welcomed distraction to their mental illness or other life struggles:

For me, I think it would just be that time to just forget about things and just focus on something that you enjoy. Just have a bit of fun with that (young person).

In addition, young people were interested in the opportunity to socialise, and connect with others with a shared experience. Clinicians expressed similar views, yet their dialogue focused more on the benefits of PA, social opportunity, and a sense of belonging:

Socialization and stigma, all these issues for these young people. And just getting a group, getting them a sense of community, getting them doing things other young people would be doing (clinician).

Clinicians discussed the cardiometabolic problems that accompany psychosis, and the importance of PA to combat these problems.

3.3.1.2. Resource gap.

Despite the acknowledged benefits of a sport program for psychosis recovery, the participants noted few opportunities to engage in sport through their health services. The majority of services involved in the study offered opportunities for physical activity via group based exercise (e.g., yoga, walking, cycling, gym-based exercise). However, none of the services offered sport-based physical activity options as part of their therapeutic program. Some of the young people recalled enjoying sporting opportunities while in hospital, and expressed interested in a sport program as part of (or supported by) their mental health service provider:

Yeah, it'd definitely be interesting. When you mentioned it, I thought, Oh, what a great idea."Sports always helped me, and I know that even when I was in hospital, they had a basketball hoop outside, and that helped me with my life, just getting outside and doing something, taking your mind off things. And I think that would be great for so many other people that've experienced

mental health issues, because it does. It's like another world. It takes your mind off things. Just, yeah, it's great for that (young person).

Many of the clinicians noted that services were “resource poor” and unable to offer sport programs, or support a client’s engagement in community sport programs. The majority of the young people revealed that they had prior experience in organised sport, but that many of them had disengaged in sport for various reasons, including their mental illness. As one clinician described:

One of the things that I've noticed with a few young people is they were very actively involved in sports at school, but they haven't been engaged in sports as an independent adult. It's really tricky for them, especially with a mental illness.

Participants explained that participating in existing community sport channels (or returning to their previous sport clubs) is difficult for young people with FEP:

I would definitely want to try (getting involved in sport again) because it's good for me, but it's mainly just getting the funds to do it, which is my problem because I'm not able to work (young person).

I think sports can sometimes break down barriers, but it's just the initial step to getting into it. I have a client who would love to be doing sport, but he can't handle being around his old (sporting friends) because he had some poor incidents with them, in terms of his psychosis. They now haven't supported him, and he feels he can't go back to (sport). Not only has he lost that friendship group, but he lost that hobby (clinician).

3.3.2. Barriers.

Participants reported several perceived barriers to engagement in a sport program for young people with FEP. They highlighted logistical and psychological barriers, and emphasised how these are interrelated.

3.3.2.1. Logistical barriers.

All participants expressed logistical concerns that could limit engagement in a sport-based life-skills program, the most predominant of which were limited resources and location. Limited resources included financial resources to buy sport clothing and equipment, and transportation challenges. Clinicians discussed that most clients do not drive, and cannot always rely on friends or family for rides. Public transportation is both expensive and psychologically daunting for some young people

with FEP. The young people reported that they generally don't drive, and tend to rely on bike, skateboard, foot or, if necessary, public transport. In regard to location, participants explained that the need to travel a far distance negatively affects motivation, and can also trigger psychological symptoms like anxiety or paranoia in regard to transport options, especially on public transportation:

A lot of (clients) don't go very far from their houses really and they get quite anxious and potentially more paranoid the longer they have to travel on public transport (clinician).

3.3.2.2. Psychological barriers.

Psychological barriers was the most discussed topic by the interviewees. They emphasised that psychotic symptoms create barriers that are challenging to navigate for both the young person and their service provider. The primary psychological barriers discussed were anxiety, low motivation, and low self-efficacy.

3.3.2.2.1. Anxiety.

Anxiety included both generalised and social anxiety, and experiences such as fear of judgement, fear of meeting new people, and anxiety pertaining to navigating transportation or trying something new. Many of the conversations about anxiety led to the stigma of mental illness, which participants described as creating and/or having a compounding effect on anxiety:

Because it can be a little bit embarrassing. Like, I don't really mind, I don't care who knows, but like, it is a bit like, to really go from being a certain type of person and you have an episode and it's like, maybe there's something wrong with me, and then you know, like, you're not exactly the same as you once were. You kind of second-guess yourself a little bit more... you've just gotta be careful of, like, being judged (young person).

In talking about anxiety, some of the participants suggested that the residual paranoia also contributes to anxiety, and could foster distrust and provide a barrier to engagement:

There's general anxiety, and then some of my clients have got an underlying paranoia about the sporting clubs or clubs in general or the government or local council and things like that (clinician).

Clinicians suggested that, in regard to sport participation, many of their clients have experienced social marginalisation and had negative experiences with organised sport, further contributing to anxiety. This notion was absent from the

young people's discussions of their past experiences with sport, all of whom expressed a positive history with sport; however, it may be that those clients with bad sport experiences did not choose to engage in the interviews.

3.3.2.2.2. *Low motivation.*

All participants suggested that low motivation would be a barrier to engagement in a sport program. Low motivation was described by participants as a direct result of psychosis, antipsychotic medication, and substance use. Many clinicians gave the example of low attendance numbers in functional recovery programs because of low motivation, even when other barriers like transportation are absent. Young people described low motivation as a constant barrier in their general life and regarding PA in particular:

Well, probably just being tired from work or if it's a bit late and I've had a shower, then I'm just like 'I'm already ready for bed'. Those are the main things that stop me from going to the gym. But also, because I smoke a bit of weed, so if I've had some weed than that would be another reason why I wouldn't go because I'm just stoned, that's it (young person).

Participants also expressed a desire to learn ways to overcome low motivation:

Like getting more motivated would be definitely one of the things (I need) because I find it's hard to get motivated these days, especially because of my psychosis. So, yeah just having more motivation to go out and having someone to give you motivation to go would definitely be a big help (young person).

3.3.2.2.3. *Low self-efficacy.*

Participants, particularly clinicians, frequently pointed to low self-efficacy as a barrier, suggesting that low confidence in one's ability to participate in the sport activities, to engage successfully in social interaction, and/or to navigate transportation options would serve as barriers to engagement:

Not knowing what to expect, not knowing who's going to be there and not thinking that they can do it, so this confidence kind of (clinician).

Some of the young people expressed concerns regarding perceived sporting incompetence – especially relative to their past experiences – as potentially heightening their anxiety and resistance to engage in a sport program:

Just being worried that you're not at that same level as before. I always had a huge anxiety because I didn't want to let the team down (young person).

3.3.2.2.4. Interplay of barriers.

It is clear that each of the identified discussed barriers on their own could limit engagement, but participants described them as being interrelated. For example, a low degree of anxiety on its own may not necessarily prohibit engagement, but if coupled with low motivation and/or low-self efficacy, the barriers to participation may become insurmountable. Psychological and logistical barriers share the same interplay. For example, participants indicated low motivation may not necessarily preclude participation in a sport program, but if the program is far away and/or is challenging to get to, the chance of attending may decrease.

3.3.3. Enablers.

Participants reported potential enablers to participation in a sport-based, life-skills program, the majority of which related to positive environmental expectations and experiences.

3.3.3.1. Positive environmental expectations and experiences.

Participants explained that the expectations of the sport program environment are critical to facilitating initial engagement and that the actual experiences of the environment will determine sustained participation. It is important that young people expect and experience an environment that is safe, flexible, supportive, normalised, and logistically easy; and that they experience (but not necessarily initially expect) an environment that is conducive to growth experiences.

3.3.3.1.1. Safety.

Participants described a safe environment as one that is inclusive, inviting and informed. Young people described feeling included when they do not anticipate or experience judgement, such as when there are others there with a shared experience:

Like, I remember being really confident while I was (at a hospital-based exercise group) because I felt like there was other people that were going through the same thing as me and it didn't feel as weird... So you can be yourself a little bit more. So I think with other people who have gone through psychosis if that was, if somehow that was made known, that there would be other people who have experienced the same thing (young person).

Perceptions of inclusion were also characterised by an environment that is open and friendly (e.g., familiar faces). In terms of feeling informed, participants described key aspects as knowledge of processes or activities, who will be there, and available resources should they experience challenges. Participants indicated that expectations and experiences of environmental safety are heightened when the facilitators are inclusive (i.e., knowledgeable and empathetic about psychosis), inviting (i.e., are a familiar and friendly face), and informed (i.e., the mental health history, needs, and triggers of the young person are known). Clinicians emphasised the importance of recruiting through the clinical care teams to promote safety, thereby ensuring that only individuals at an appropriate point in their recovery are invited into a sport intervention.

3.3.3.1.2. Flexibility.

It was clear that the needs of young people with FEP are varied, and there is no “one size fits all” approach; a sport program designed for young people with FEP must be flexible to allow for different needs. This variance includes sport preferences, sport experience/abilities, recovery trajectories, backgrounds and symptomology. The program would need to allow for variations in individuals symptoms for day-to-day or week-to-week (such as allowing graded participation). Participants expressed the importance of meeting the individual needs of the young people where possible, which could be accomplished in part by, for example, asking the individual what they want to get out of the program, what their concerns are, and how they would like to be supported.

Well, probably having someone like you, or a person that knows about the program very well to maybe talk to them first, so have a meeting before the thing, ask them similar questions, like What are you ... "not afraid of, but Are you willing to come to the group?" Or, What do you want in terms of ... What do you want to get out of the group?" And I think that if you have that talk, then the time when you do, they'll go. When it is time to come to the group, then they actually have someone that they feel like they can rely on, that they know, so that it's not just them by themselves there (young person).

3.3.3.1.3. Support.

The expectation and receipt of support is important for initial engagement and sustained participation in the sport program. This support can come from program

itself, the mental health service provider, fellow participants, or others (e.g., family or peers). The support could be logistical (e.g., transport support), emotional (e.g., listening and reassuring in a challenging moment), or motivational (e.g., encouraging reminders or positive feedback). The participants expressed that the opportunity for a young person to bring a supportive peer may enhance actual and perceived support:

Bring a brother, or bring, bring a cousin or whatever. It doesn't matter, bring somebody. That would make you feel a lot more comfortable being outdoors. I guess

you would have a lot more fun and...It wouldn't really be like about the illness, it

would like be more of a community thing (young person).

3.3.3.1.4. Normalisation.

Participants stressed the importance of meeting the specific needs of young people with psychosis, yet they also emphasised they are young people before “young people with psychosis”, and that the environment should reflect this. Mental illness should be considered, but not at the expense of a sense of normalcy.

Participants indicated that an environment feels normalised when it is relatable, fun, and real. They described a relatable environment as one where people can connect over commonalities. These commonalities may be, for example, a shared experience of psychosis between participants, or a shared common interest between participant and facilitator. An environment is more relatable when there are limited power differentials (e.g., participants have opportunities to lead). Participants, especially the young people, described an environment as fun if it emphasises the activity over recovery. Participants described an environment that is real as one that looks and feels like a sport program more than anything else:

I think sometimes with stuff like this you have to be careful that you don't place too much emphasis on the mental health because a lot of our client group don't want to be associated with stuff like that. You need to be kind of careful when marketing that whole mental health side of things. If you focus on that too much, then it kind of may push people away (clinician).

3.3.3.1.5. Logistical ease.

All participants stated that if the participants expect and experience the process of sport engagement (e.g., enrolling, getting to the venue, filling out forms,

getting home) to be straight-forward and affordable, they will be more likely to attend and return.

3.3.3.1.6. *Growth experiences.*

The participants expressed that the above enablers, combined with growth experiences, will foster sustained engagement. Growth experiences occur when individuals experience growth in their physical abilities (e.g., enhanced sporting skills), their health (e.g., enhanced fitness), their psychosocial functioning (e.g., successful social interactions), life skills (e.g., enhanced motivation or confidence), or when they overcome a challenge (e.g., navigate public transport despite anxiety). Participants suggested that if the sport program environment enables such experiences, then the barriers to engagement will be easier to overcome and the individual will be more likely to return. It is important to note that such experiences should not necessarily be the selling point of the program to obtain initial engagement. Although some young people expressed the opportunity for growth experiences as a motivating factor to attend, most explained that if the program was advertised as promoting such growth experiences, they may be less likely to attend:

Yeah, because if they feel like they're going to meet a bunch of new people, like that's great for them, but if you remind them they're meeting people it's not going to work because that can provoke anxiety (clinician).

3.3.4. **Program Design.**

Participants offered specific design recommendations for a sport program for young people with FEP. The design recommendations related to: a) sport/program type preferences, b) the inclusion of a life skills training element within the program, and c) specific ways to limit barriers and strengthen enablers (see Table 3.2 for application suggestions).

Table 3.2. *Design Recommendations from Participants to Limit Barriers and Strengthen Enablers*

Barrier/ Enabler <i>(Sub-theme)</i>	Design recommendations: DO	Design recommendations: DON'T
Barriers: <i>Logistical</i>	<ul style="list-style-type: none"> • Provide transport support (e.g., rides or vouchers) • Provide support for transport planning (e.g., help young person map out route; have someone do route with them first time) (C only) 	

	<ul style="list-style-type: none"> • Consider proximity (e.g., run program in close proximity to young people’s homes and public transport lines) • Provide sport kit if needed (C only) 	
Barriers: Psychological; <i>Anxiety</i>	<ul style="list-style-type: none"> • Provide opportunities to “meet and greet” (e.g., BBQ before program begins) • Encourage “bring a friend”- (e.g., young people bring a friend, family member, clinician, partner, etc. to accompany them and participate in program) • Provide support for transport planning (e.g., help young person map out route) • Consider proximity (e.g., run program in close proximity to young people’s homes and public transport lines) • Program facilitators to have a presence at the service to become “familiar faces” (C only) 	
Barriers: Psychological; <i>Low motivation</i>	<ul style="list-style-type: none"> • Provide reminders • Provide food • Provide opportunity to reflect on and practice growth experiences (C only) 	
Barriers: Psychological; <i>Low self-efficacy</i>	<ul style="list-style-type: none"> • Allow graded participation (e.g., allow a participant to initially observe, and slowly encourage participation) • Model participation (e.g., facilitators with low sport skills still participate) • Adjust rules of play to suit abilities • Provide basic sport skill training through simple and fun activities • Encourage goal-setting • Provide support for transport planning (e.g., help young person map out route; have someone do route with them first time) (C only) • Provide activities that facilitate social interaction 	
Enablers: Positive Environmental Experiences and Expectations; <i>Safe</i>	<ul style="list-style-type: none"> • Learn mental health history of participants • Create a collaborative (e.g., engage young person in process) support/crisis management plan for each individual • Create regular feedback loop between program and care team • Clarify resources available to participants (e.g., who to go to for more support, transport/kit support) • Encourage “bring a friend”- (e.g., young people bring a friend, family member, clinician, partner, etc. to accompany them and participate in program) 	<ul style="list-style-type: none"> • Allow facilitators to just observe

	<ul style="list-style-type: none"> • Educate facilitators on psychosis and what to expect, and how to support • Recruit through service to ensure physical and mental fitness to participate (C only) 	
Enablers: Positive Environmental Experiences and Expectations; <i>Flexible</i>	<ul style="list-style-type: none"> • Discuss mental health history, needs, concerns, and goals with each participant • Cater program activities to needs/abilities of participants • Provide a range of sport options • Provide alternative activities • Allow graded participation (e.g., allow a participant to initially observe, and slowly encourage participation) 	<ul style="list-style-type: none"> • Mandate regular attendance • Require participation
Enablers: Positive Environmental Experiences and Expectations; <i>Supportive</i>	<ul style="list-style-type: none"> • Provide transport support (e.g., rides or vouchers) • Provide support for transport planning (e.g., help young person map out route; have someone do route with them first time) (C only) • Provide sport kit if needed (C only) • Create a collaborative (e.g., engage young person in process) support/crisis management plan for each individual • Create regular feedback loop between program and care team • Clarify resources available to participants (e.g., who to go to for more support, transport/kit support) • Encourage “bring a friend”- (e.g., young people bring a friend, family member, clinician, partner, etc. to accompany them and participate in program) • Educate facilitators on psychosis and what to expect and how to support 	
Enablers: Positive Environmental Experiences and Expectations; <i>Normalised</i>	<ul style="list-style-type: none"> • Focus on fun components (e.g., sport activity, social time, eating) • Encourage facilitators to engage with participants and find common ground • Use facilitators that participants can connect with (e.g., similar age, lived experience, etc). • Encourage facilitators and leads to participate • Encourage participants to lead where relevant • Be aware of language (e.g., terms like goal setting or mindfulness have been over used with this population and therefor will carry little value) (C only) • Prioritise “getting foot in the door,” and creating an enjoyable experience. 	<ul style="list-style-type: none"> • Focus on mental illness • Market only recovery components

<p>Enablers: Positive Environmental Experiences and Expectations; <i>Logistically easy</i></p>	<ul style="list-style-type: none"> • Provide transport support (e.g., rides or vouchers) • Provide support for transport planning (e.g., help young person map out route; have someone do route with them first time) (C only) • Consider proximity (e.g., run program in close proximity to young people’s homes and public transport lines) • Provide sport kit if needed (C only) • Minimise data collection (e.g., overlap with service data collection if possible) (C only) • Prioritise “getting foot in the door,” and creating an enjoyable experience. Make first experience(s) as enjoyable and logistically easy as possible. 	
<p>Enablers: Positive Environmental Experiences and Expectations; <i>Growth Experiences</i></p>	<ul style="list-style-type: none"> • Be aware of language (e.g., terms like goal-setting or mindfulness have been overused with this population and therefore will carry little value) (C only) • Provide time to reflect, discuss, and share (C only) • Prioritise “getting foot in the door,” and creating an enjoyable experience. Then, once confidence builds and anxiety decreases, include targeted growth experiences. 	<ul style="list-style-type: none"> • Focus only recovery/growth components

Note. Some “don’t” cells are empty as there were not specific recommendations for what not to do for each type of barrier/enabler. Some recommendations are repeated due repetition across themes. Recommendations were made by both clinicians and young people unless noted (“C only” or “YP only”).

3.3.4.1. Sport or program type preferences.

Participants provided feedback on four different types of sport programs: 1) a multiple week, single sport program, 2) a multiple week multi-sport program, 3) a condensed 2-4 day retreat style program, and 4) a 1-1 mentoring program that would connect participants with existing sport programs within the community with support provided. The responses to each were positive, with mixed preferences on a top choice. In general, a multi-sport format was preferred over a single sport as it might appeal to more people, and more easily allow participants to reintegrate after a missed session. Many participants expressed interest in a combination of the three program types (e.g., multi-week program that leads into a retreat and culminates with connecting participants to existing community programs). Some clinicians provided caution regarding any overnight program because of managing substance use. Popular sport preferences were touch Australian rules football, touch rugby, ultimate Frisbee, and soccer, but the consensus was that any sport would be advisable providing the program caters for all levels of sporting experience.

3.3.4.2. Life skills training element.

Participants provided feedback on the inclusion of a life skills training element within a potential sport program. Participants responded positively to this notion, but also expressed caution. All underscored the importance of life skills for functional recovery, and were responsive to the idea that sport can be used to teach such skills. Young people were predominantly interested in developing motivation, social skills, confidence, and emotional regulation, whereas clinicians focused more on the need for motivation, social skills, and confidence building. Both groups suggested that a life-skills training element be embedded gently, so as not to hinder engagement. Young people in particular expressed that their desire to engage in a sport program would be largely to forget about their mental illness or be distracted from symptoms; a heavy focus on life skills training could impede this.

3.3.4.3. Application.

Participants were asked to provide specific recommendations in regard to strengthening enablers or limiting barriers to participation in a sport program for young people with FEP. A summary of their responses is provided in Table 3.2.

3.4. Discussion

This study is the first to explore barriers to and enablers of sport participation for young people with FEP, and adds to the limited qualitative literature exploring PA engagement in people with FEP (see Firth et. al., 2016c). This knowledge is particularly important considering challenges of engagement in recovery services for people with FEP (Tindall, Allot, Simmons, Roberts, & Hamilton, 2018). Our results indicate that the dynamic nature of sport (encompassing PA, social connectivity, and life skills development) may provide an opportunity to maximise the time that young people with FEP engage with recovery focused activities. Participants' responses suggest that gaining initial engagement in sport-based programs will be challenging, but that the growth opportunities inherent in sport may facilitate subsequent increased engagement. Echoing a finding by Firth and colleagues (2016a), we found that catering to the specific needs of people with FEP is imperative for adherence and engagement. Similarly, the importance of designing to the preferences and needs of young people has been supported in exercise programs for young people with depression (e.g., Carter et al., 2015). The knowledge that individual preferences are important to young people is valuable within sport program design and beyond.

Barriers to PA for people with FEP such as low motivation and symptomatology have been previously reported (see Firth et al., 2016d, Vancampfort et al., 2018). However, the anxiety and low confidence found in the current study have not been documented elsewhere. It may be that the components of sport trigger greater levels of social anxiety and lower levels of self-efficacy (e.g., because of the group aspect or specialised skills required). Such an interpretation could explain previous findings that people with FEP prefer gym-based exercise to sport (Firth et al., 2016c). It may not be that the gym is actually preferred over sport, but that the gym may appear more safe and accessible - an important notion to explore further and consider in intervention design.

The importance for an environment to cater to the needs of the individual and provide support and the opportunity to relate to others was evident in this study. Motivational theories, such as Self-Determination Theory (SDT), provide a conceptual backdrop upon which to interpret these findings. Informed by SDT, social contexts can nurture people's inner motivation by satisfying their psychological needs of autonomy (e.g., engaging the individual in designing their care plan), relatedness (e.g., providing an environment where participants and facilitators can relate to one another), and competence (e.g., catering a program to meet the needs of the individual so that they can set and achieve goals; Ryan and Deci, 2017). Promoting autonomy and social support have been found to be critical in engaging people with FEP in exercise (Firth et al., 2016a). Self-efficacy has been found to be important to sustain PA intentions in people with psychosis (Lee et al., 2018). In addition, Vancampfort and colleagues (2018) showed that autonomous forms of motivation (e.g., enjoy the activity itself, value the benefits of an activity) may play a pivotal role in adopting and maintaining PA activity for people with FEP. Taken together with past work, our findings underscore the importance of a motivationally enriched sport-based, life-skills program (e.g., see Ntoumanis, Quested, Reeve, & Cheon, 2018 as to how to create motivationally supportive sports environments).

3.5. Limitations and Future Directions

The findings have implications for FEP intervention globally, but it is necessary to consider that our interviews and focus groups were conducted in and around Perth, Australia. Demographic information for the clinicians was not

collected; such information could have provided additional context for the interpretation of the results. In addition, the sample of young people was relatively small. Although a sufficient level of data saturation was reached in these interviews, it is important to note that all the young people were Caucasian, predominantly male, and had a sporting background. In discussions regarding the limited diversity in participants, the services reported that their client base is predominantly male, and that more male clients were eligible and/or interested in participating. This may speak to the demographic within this population that are interested in sport, and the reports by young people in this study may be limited in regard to their application to other genders or ethnicities. Future work should further explore and consider how gender and culture may influence barriers and enablers to sport participation, and sporting preferences for young people with FEP.

The current study highlights some of the many benefits that sport participation affords, and implores future work in FEP recovery to consider the use of sport. However, it is important to note that just because the benefits of sport participation are well documented, not all sport is inherently beneficial. It is important that researchers and service providers do not take on the ‘sport evangelist’ mindset, that is, “blindly believe that sport participation inevitably contributes to development because sport’s assumed essential goodness and purity is passed on to those who partake in it” (Coakley, 2011, p. 306). For example, researchers have found that sport participants do not automatically inherit sport-based life skills development simply through participation, but that systematic efforts are required for life-skills development and transfer (Pierce, Gould, & Camire, 2017). In addition, despite the many positive benefits of sport participation, there are also potential dark sides to sport that must be considered. For example, it has been documented that sport settings can be home to bullying (e.g., Mishna, Kerr, & McInroy, 2019), discrimination (e.g., Krane, 2016), and increased substance use (e.g., Grace, Knight, Rodgers, & Clark, 2017). Given the vulnerability of people with FEP to such problems, it is critical that researchers and service providers consider the positive effects against these potential dark sides when using or encouraging sport with this population.

3.6. Conclusion

The findings emphasise the unique and varied needs of young people experiencing FEP. Our findings provide knowledge that can be used to guide the design of sport-based interventions for this population, and may be useful in early intervention design in general. The participants reported noteworthy challenges in engaging young people with FEP in sport. However, the reports given by participants suggest that the potential recovery benefits within sport should implore us to persevere in seeking ways to limit the barriers and maximise enablers enough to enable engagement.

Chapter 4: The Development of a Sport-Based Life Skills Program for Young People with First Episode Psychosis: An Intervention Mapping Approach

4.1. Introduction

For young people recovering from first episode psychosis (FEP), it is well documented that early intervention is critical for long-term functionality and well-being (e.g., Santesteban-Echarri et al., 2017). Following a FEP, young people tend to experience cardiometabolic problems, social isolation, and challenges in everyday functioning (McGorry & Goldstone, 2016). As such, key goals of functional recovery promotion for young people with FEP include increasing levels of physical activity (Firth et al, 2016 a,b,c), social connectivity (Gee et al., 2016; McCarthy-Jones et al., 2013) and enhancing life skills (McGorry & Goldstone, 2016). To date, these goals have largely been targeted individually, although multifaceted interventions for this population have emerged recently, with promising results (Curtis et al., 2016). Sport has been advocated as an untapped platform to provide multidimensional functional recovery support (i.e., through physical activity, social connectivity, and life skills training; Brooke, Lin, Ntoumanis, Gucciardi, 2019 [chapter 2]). Preliminary research with young people and their clinicians supported the need and acceptability for sport-based programs for functional recovery from young people with FEP (Brooke, Gucciardi, Ntoumanis, & Lin, 2019 [chapter 3]). As such, the goal of the current study was to develop an intervention map for a sport-based, life skills program for young people recovering from FEP. This goal is markedly different from that of a protocol paper in that it focuses heavily on the development process.

In any health related intervention design process, it is critical to understand the specific needs of the population, the nuances of the health problem(s) they are facing, and their resource and support opportunities. In regard to young people with FEP, preliminary research highlighted the barriers and enablers to engagement in sport participation for young people with FEP (Brooke et al., 2019a [chapter 3]; see Table 4.1 for an overview). Similar challenges to engagement have been documented in for young people with FEP (Brown et al., 2019; Woodhead & Monson, 2013). Given the challenges to engagement, combined with the novelty of utilising sport as a recovery platform for young people with FEP, it is imperative that a rigorous intervention design approach is employed. We selected an intervention mapping (IM) approach because of its demonstrated utility in informing effective health-related

interventions (Bartholomew Eldredge et al., 2016; see also, Garba & Gadanya, 2017; Lamort - Bouché et al., 2018). The IM approach encompasses six in-depth, iterative, and cumulative steps for planning, developing, implementing, and evaluating effective interventions designed to promote health or improve a health problem. Our purpose in this paper is to describe the process and outcome(s) of each of these steps. In doing so, this paper presents a novel addition to the FEP literature base in that it is the first, to our knowledge, to utilise the following within intervention design for FEP populations: 1) intervention mapping 2) a sport-based intervention foundation, and/or 3) sport-based life skills training.

Table 4.1. *Overview of Themes from Qualitative Study Exploring Barriers and Enablers to Sport Participation for Young People with FEP*

Theme	Subthemes	Subtheme details
Need for Sport in FEP	Perceived benefits	Clinicians <ul style="list-style-type: none"> • Physical activity • Social opportunity • Sense of belonging Young people <ul style="list-style-type: none"> • Opportunity for enjoyable/fun activity • Connection opportunities • Distraction from mental illness • Fitness/health
	Needs/resource gap	<ul style="list-style-type: none"> • Limited existing opportunities • Limited resources • Community engagement not feasible
Barriers	Logistical	<ul style="list-style-type: none"> • Limited resources • Location
	Psychological	<ul style="list-style-type: none"> • Anxiety • Low motivation • Low confidence
Enablers	Positive environmental expectations	<ul style="list-style-type: none"> • Safe ⑦ inclusive, inviting, informed • Flexible ⑦ individual needs met • Supportive ⑦ service + program + others • Normalised ⑦ relatable, fun, realistic • Logistically easy ⑦ straight forward • affordable

		<ul style="list-style-type: none"> • Growth experiences 7 experienced; 10 initially expected
Program Design	Sport/program type	<ul style="list-style-type: none"> • Open to wide range of options • Balance experience levels • Caution re: substance use and overnight options
	Life skills training	<ul style="list-style-type: none"> • Positive response but embed gently • Priority: motivation, social skills, confidence, emotional regulation
	General recommendations	<ul style="list-style-type: none"> • Limit barriers • Strengthen enablers

Note. See Brooke et al. (2019a; chapter 3) for further description

4.2. Methods and Results

4.2.1. Step 1: Logic model of the problem.

As is the case for any type of behavioural intervention, a critical first step is to identify and understand the problem (e.g., what needs to be changed for whom, barriers and enablers of implementation or change). In this context, the population at risk is young people with FEP, and the problem is risk of poor functional recovery. To ensure long-term functional recovery, young people need engaging multi-faceted interventions to promote physical health, mental health, social connectedness, and life-skills development. The objective of this intervention mapping process is to see if, and how, sport can be used to maximise functional recovery goals within FEP populations.

4.2.1.1. Establish and work with a planning group.

A well-rounded team is essential to assessing the needs of the population and understanding contextual details essential to intervention development and delivery (Bartholomew Eldredge et al., 2016). Our team varies in specialties, which provided richness in perspective and experience. We bring together a variety of research and practical experience within the fields of sport psychology, health behaviour change, youth mental health, and early intervention in psychosis. Most pertinent to this project, our team collectively has experience in delivering sport-based, life-skills interventions to vulnerable youth, developing mental health interventions for vulnerable youth (including young people with FEP), developing general health promotion interventions, and collaborating with local early psychosis services for

research purposes. We have experience with and value the principles of co-design and participatory research (e.g., Baum, MacDougall, & Smith, 2006; Nakarada-Kordic, Hayes, Reay, Corbet, & Chan, 2017). As a result, we involved the consumer and key stakeholders (e.g., young people with FEP, early psychosis service providers such as clinicians and occupational therapists) throughout all six steps of the IM process, as valuable members of the planning group.

4.2.1.2. Conduct a needs assessment to create a logic model of the problem.

The goal of the needs assessment phase is to gather information that enriches the planning group's understanding of young people with FEP from a social, behavioural, and epidemiological perspective. In addition, within the needs assessment process, the team seeks to understand the community of the population at hand (Bartholomew Eldredge et al., 2016). In this case, we explored the resources available to young people with FEP within their community. This exploration encompassed the home and social environment, and early intervention services, focusing both on the strengths and the gaps in opportunity. Bartholomew Eldredge and colleagues (2016) explained that a thorough needs assessment enables a systematic examination of the "discrepancy between what is and what should be" (p. 172). Our goal in this regard was to describe the problem and its causes factually, and seek the opinions of those people and groups with a vested interest in the problem and its solution. In the current study, these pathways were explored predominantly through two means: 1) a narrative review of the psychosis recovery and sport based life-skills literatures (i.e., factual description), and 2) focus groups and interviews with young people with psychosis and their clinicians regarding the barriers and enablers to sport participation for young people with FEP (i.e., stakeholder opinion).

4.2.1.2.1. Narrative review.

Before progressing with the intervention development, it was important to assess the need for sport-based interventions within FEP recovery practices. We therefore conducted a narrative review to address the question: should sport-based, life skills interventions be developed for young people recovering from first episode psychosis (see Brooke et al., 2019b [chapter 2])? As this question had not yet been explored empirically, a broad critical review of literatures on (i) FEP and (ii) life skills development via sport was performed to uncover the conceptual and empirical links between the two. We found that critical components of an individual's recovery following a psychotic episode include: 1) physical activity, 2) opportunities to build

life skills, and 3) social connectivity. Our review of the sport and life skills literature indicated that sport can be a powerful platform from which to: 1) promote physical activity, 2) teach life skills, and 3) foster social connectivity within vulnerable populations. As such, we concluded that there was a need within FEP recovery services for sport-based interventions.

4.2.1.2.2. Focus groups and interviews.

With the need for sport within FEP recovery services established, the next step was to seek stakeholder opinions on this notion, and on how to best deliver the intervention. To do so, we conducted semi-structured, 1-1 interviews with young people recovering from FEP recruited through local early psychosis service centres (n=10, aged 16-25 years, referred by their clinical care team and deemed stable enough in symptomatology to participate). We also conducted and focus groups and 1-1 interviews with FEP clinicians (n=33; five focus groups of 5-8 people; seven 1-1 interviews). The objectives of the interviews and focus groups was to obtain feedback on the idea of using sport within FEP recovery, to understand current physical activity resources within services, and to explore the barriers and enablers to sport participation for young people with FEP. We identified four themes (and eleven sub-themes) from our discussions with key stakeholders (see Table 4.1 for an overview). Full details of the study are available in Brooke et al., 2019a [chapter 3]. Briefly, key stakeholders supported the need for and acceptability of a sport-based, life-skills programs as one means by which to maximise functional recovery for young people with FEP. In regard to feasibility, participants indicated that barriers (e.g., transport challenges, social anxiety) for this group are high, and that significant efforts will need to be made to limit barriers and facilitate enablers for the benefits of sport to be accessible to young people with FEP.

4.2.1.2.3. Needs assessment conclusion.

Overall, the needs assessment highlighted the unavailability of sport access to young people with FEP, supported further exploration of the use of sport for FEP functional recovery, and laid the foundations for a logical model of the problem (see Figure 4.1).

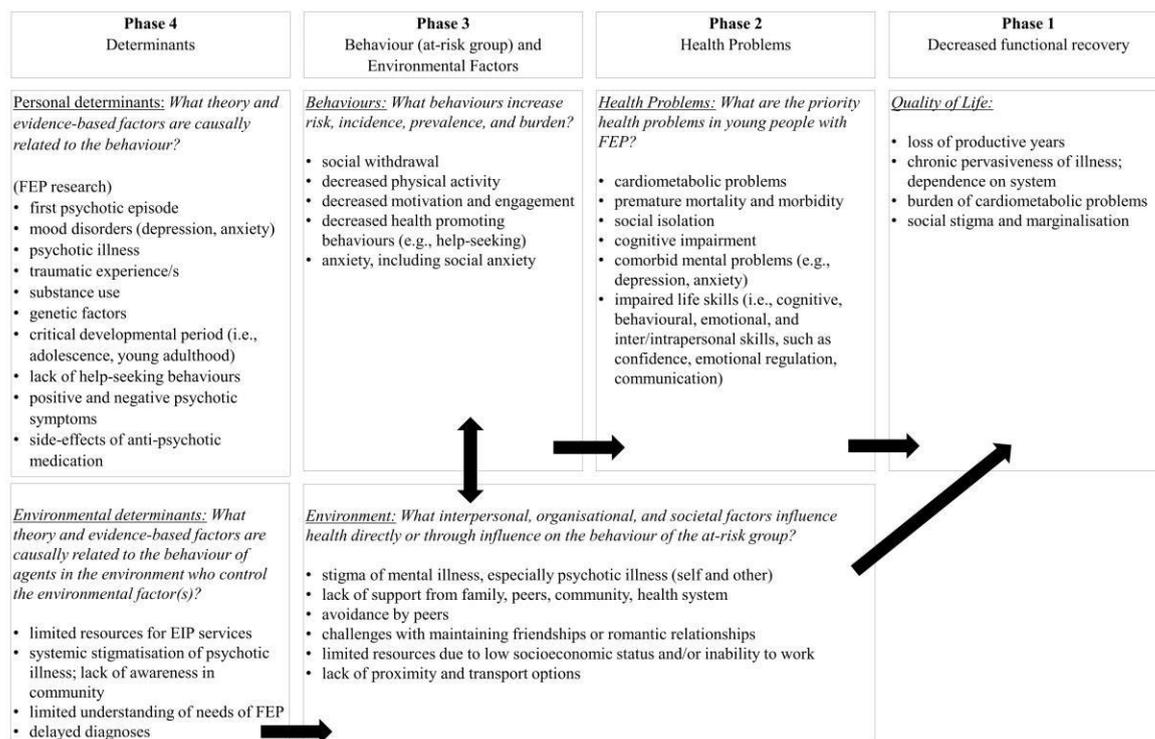


Figure 4.1. Logic model of the problem: low functional recovery levels in young people with FEP

Note. Phases are labelled in order of model development (i.e., begin with the problem at hand and work backwards to the determinants). Please see Bartholomew Eldredge et al. (2016) for further clarification on figure construction and purpose.

Due to the demonstrated need and high support levels of key stakeholders, combined with the novelty of the approach, we decided to move forward with a pilot and feasibility study, despite the identification of significant barriers (e.g., motivation and anxiety may limit engagement). The Medical Research Council (MRC) recommends to follow systematic intervention design with testing of any uncertainties through piloting (Craig et al., 2008). The goal of this study would be to assess the acceptability and feasibility of a sport-based, life skills intervention for young people with FEP, and to test out specific intervention components. A feasibility study with a non-randomised pilot will assess the worthiness of proceeding further with intervention development and enhancement, provide information on how to do so, and also test specific design features (Eldridge et al., 2016). More specifically, a feasibility study approach will help determine if the intervention is appropriate for further testing and development, and assess components such as acceptability and, if and how, modification is recommended (Bowen et al., 2009). Elements of a pilot study approach will be included to test specific intervention components (Arrain et

al., 2010). Randomisation will not be appropriate at this early stage of feasibility testing, but a pre-test/post-test design will provide insight into questions relating to feasibility and the effectiveness of certain intervention components.

4.2.1.3. Describe the context of the intervention including the population, setting, and community.

Following the needs assessment, and before beginning more detailed design phases, it is important to understand the intervention context and the preliminary program goals. The intervention will be a sport-based, life skills intervention for young people aged 16-25 years with FEP in the Perth (Western Australia) metropolitan area. This area has approximately eight early psychosis specific services that span a large geographic area, servicing both urban and rural clients. To meet the needs of a feasibility and pilot study approach, it was determined that all phases of the study (i.e., design, recruitment, delivery, and evaluation) would be conducted in conjunction with just one of these services. A service partner was selected based on congruence between the goals of the services and those of the research team, and the service's availability to and interest in providing support (e.g., design, recruitment, transport, and feedback) for the study. In the early stages of the relationship (September 2018-February 2019), the service partner had begun accepting referrals from local early intervention services. Eligibility requirements for this service include that the young person must be between 16 and 25 years old, have had their first episode of psychosis in the past 12 months, be receiving care from a local early intervention psychosis service, be interested in working toward functional recovery goals, be ready to work toward functional recovery goals as deemed by their clinical care team, and reside within the service's catchment area. This service is located within the Perth metropolitan area, but has a large catchment that services some semi-rural areas of the wider Perth region (roughly 900 square km.). As a result of the fact that this is a new service that serves a wide area, certain logistical barriers may be even more heightened (e.g., low client numbers and transportation/logistical challenges). Nevertheless, despite these potential challenges, this service was selected because of the alignment of the study and service needs and goals.

4.2.1.4. State Program Goals.

The program goals are as follows:

1. To assess the feasibility and acceptability of a sport-based, life skills program for young people with FEP in preparation for a larger RCT.
2. To test the selected intervention components.
3. To increase life skills, physical health and abilities, and social connectivity of the participants.
4. To develop a sustainable program that can evolve within the community.

4.2.2. Step 2: Program outcomes and objectives, and logic model of change.

The logic model of the problem outlines behavioural and environmental conditions that lead to low levels of functional recovery in young people with FEP. The next step is to identify program outcomes and objectives necessary for change to occur. More specifically, the goal of this step is to identify what the sport intervention would need to accomplish and enable in order to have a positive effect on functional recovery levels. Consistent with guidelines (Bartholomew et al., 2016) and applications of IM (e.g., Direito et al., 2018; Krops, Dekker, Geertzen, & Dijkstra, 2018), we completed a series of planning team discussions in which we examined the key elements of the needs assessment, alongside program goals and possible intervention scenarios.

4.2.2.1. Expected outcomes for behaviour and environment.

The start point is to determine the expected outcomes for the behaviour and environment that need to be evident in order for a change in functional recovery to occur. In other words, what behaviours will be accomplished as a result of the intervention, or what environmental conditions will be present as a result of the intervention (Bartholomew Eldredge et al., 2016)? Guided by the needs assessment and group discussion amongst the team, we determined the following behavioural outcomes to be critical for the intervention participants: attend program, engage in program, demonstrate life-skills development within the context of the program, and transfer life skills to other contexts.

4.2.2.2. Performance objectives for behavioural and environmental outcomes.

The next task is to specify performance objectives that will lead to the previously determined behavioural and environmental outcomes. The outcomes

stated above are broad in nature, whereas the performance objectives provide clarification to the specific performance expected by the participants or environmental agents that will enable the behavioural and environmental outcomes (Bartholomew Eldredge et al., 2016). For example, we selected the following performance objectives for the behavioural outcome ‘attend the program’: arrange transport, feel supported in attending, and feels autonomously motivated to attend. Full details of the performance objectives are provided in table S4.1.

4.2.2.3. Select determinants for behavioural and environmental outcomes.

The next phase of step two is to identify evidence and theory-based personal determinants, that is, factors that are associated with the performance objectives and in turn enable the behavioural and environmental outcomes. In other words, determinants are those elements that make possible the performance or conditions relating to behavioural or environmental outcomes (Bartholomew Eldredge et al., 2016). The needs assessment was instrumental in this phase, as it highlighted several key determinants. Planning group discussions allowed for refinement of these determinants, which were finalised as follows: knowledge, self-efficacy, support, and outcome expectations. Each determinant was defined in relation to each performance objective. Full details of the determinants for behavioural and environmental outcomes are provided in the matrices of change elements (see Table S4.1).

4.2.2.4. Construct a matrices of change objectives.

We compiled the information generated in steps 2.1-2.3 into a matrix of change objectives for each level of intervention planning (see Table S4.1). In this instance, the levels were individual (participants) and environmental (service, peers/family, and program facilitators), but the matrices display only the individual level, as the environmental levels are embedded within the individual level (e.g., receiving support from peers and family is part of the support determinant at the individual level). This matrix provides an interrelated display of critical foundational intervention components that form the logic model for the change process.

4.2.2.5. Create a logic model of change.

The achievements of step two facilitate the evolution of the logic model of the *problem* developed in step one into a logic model of *change*. The matrices of change highlight what needs to change within the determinants for the intervention participants to be able to display the performance objectives, and thus set in motion the domino effect that leads to functional recovery improvements. In essence, the change objectives involve strengthening the determinants. For example, we know that participants will need to understand transport options (K.1.1) in order to be able to arrange transport (PO 1.1) and attend the program. Thus, the naturally inferred change objective in this instance is that young people participating in the program are able to list their options for transport to the program. These change objectives provide the start point from which to select specific program design elements in step 2. The logic model of change is displayed in Figure 4.2.

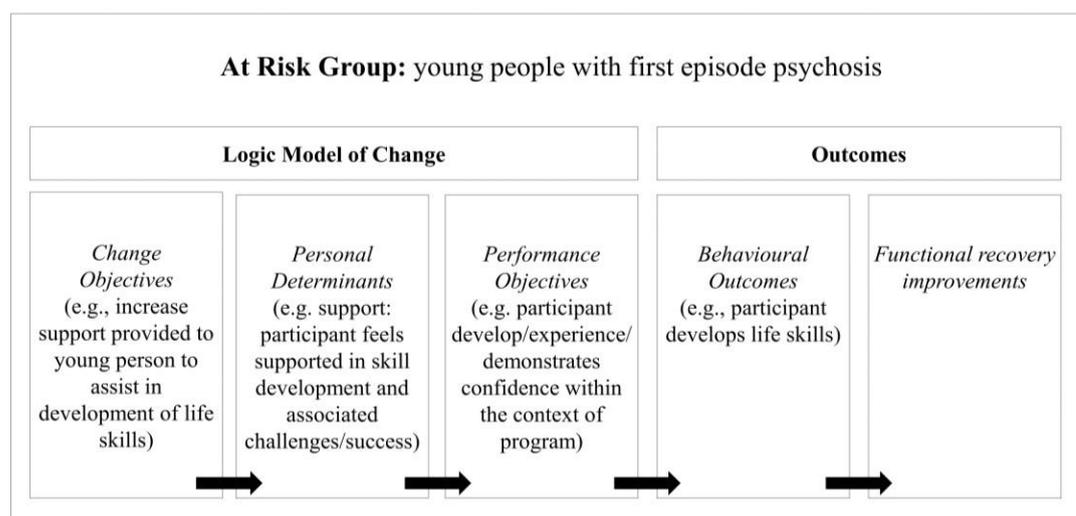


Figure 4.2. Logic model of change

Note. Please see Bartholomew Eldredge et al. (2016) for further clarification on figure construction and purpose.

4.2.3. Step 3: Program design.

4.2.3.1. Generate program themes, components, scope, and sequence.

Several discussions regarding program design amongst the planning group and with the service partner took place over seven months. In these discussions, ideas about program themes, components, scope, and sequence were put forward and compared. These discussions were informed by the literature in early intervention in psychosis (e.g., Santesteban-Echarri et al., 2017; Woodhead, & Monson, 2013), the needs assessment conducted, practical experience, and the specifics relating to the

service (e.g., location, client needs, service resources). These discussions confirmed that a combined pilot/feasibility study approach was most warranted, given that sport-based recovery efforts in FEP have limited empirical support to date.

We decided on a six-week (once a week), multi-sport program. This choice was pragmatic, and we determined this format to be the best way to cater to the goals of the intervention, the potential barriers to engagement, and our own resources. We decided to present the program as a sport-based, life skills program, where the emphasis would be on sport with the life skills gently embedded. This choice was informed by the interviews in the needs assessment, in which participants emphasised the importance of it feeling like a sport program first and foremost. We selected an iterative approach for the program, in which program components and sequence will be adjusted on a weekly basis to meet the individual needs of the specific participant group, and in response to the weekly feedback from participants and the service partner and/or observations from the facilitators. The principles of participatory action research (Baum, MacDougall, & Smith, 2006) will be utilised, and feedback will actively be sought from the service partner and participants before, during, and after the intervention in an effort to adjust the program design to best meet the needs of the participants. Feedback will be collected casually during the sessions, via email, text, or phone call (depending on the young person's preference), through meetings with the service staff between intervention sessions, and via semi-structured interviews with the service staff and participants after the intervention.

4.2.3.2. Choose theory and evidence-based change methods, and select or design practical applications to deliver change methods.

Theory and evidence-based change methods were selected through planning group discussions and meetings with the mental health service partner. Kok and colleagues' (2016) taxonomy of behaviour change methods was utilised as the basis from which to select evidence-based change methods. This taxonomy contains evidence-based change methods with demonstrated utility in health promotion interventions, and is specifically designed to complement intervention mapping. Evidence provided in the needs assessment (narrative review and interviews) and literature pertaining to best practices for early psychosis functional recovery interventions (see Woodhead, & Monson, 2013) and sport-based life skills interventions (see Pierce, Gould, & Camire, 2017) were used to guide the selection of change methods from the taxonomy. Once the change methods were selected,

practical applications were discussed amongst the planning group and with the service partner. An overview of the links between key determinants, evidence, theory, and practical application is presented in Table S 4.1.

4.2.4. Step 4: Program production.

The fourth step of intervention mapping encompasses producing program components and materials. In this step, the tasks include: 1) refining program structure and organisation, 2) preparing plans for program materials, 3) drafting messages, materials, and protocols, and 4) pretesting, refining, and producing materials. First, based on conversations with the service partner regarding client and service availability, it was decided that the program will run once a week at a time and location most convenient to the service partner and their clients. The structure will follow a similar pattern each week so that participants know what to expect, yet allow flexibility to cater for individual needs and incorporate modifications where necessary. Each week will contain the following phases: welcome/introduction, warm-up (mental and physical), skill learning (mental and physical), skills execution/play, cool-down/debrief, and informal social time. This structure, along with opportunities for breaks and alternative activities, will allow for graded participation and gradual skill and social development/comfort, as informed by our needs assessment (Brooke et al., 2019a [chapter 3]) and the Orygen Centre of Excellence in Youth Mental Health's early psychosis manuals (Crlenjak et al., 2015; Woodhead & Monson, 2013). A key component of the program is physical activity through sport, which is important to address the cardiometabolic problems of people with FEP, and will also be utilised as a platform to deliver life skills and promote social connectivity. However, exercise intensity and duration as it pertains to guidelines for the treatment of cardiometabolic problems and/or general physical health will not be within the scope of this feasibility and pilot study. Rather, sessions will accommodate for varying levels of fitness, with in-built breaks, modifications, and opportunities for low intensity activities (e.g., ring toss, journaling) for those not psychologically or physically able to participate. A dietician was consulted regarding the food and hydration provided. An exercise physiologist advised on physical activity components, including the warm-up, skill learning and execution, and cool-down phases. An overview of the program structure is provided in Table 4.2.

Table 4.2. *Overview of Intervention Session Phases, Components, and Aims*

Session Phase	Session Components	Aims
Introduction	<ul style="list-style-type: none"> informal social time ice breaker general check in 	<ul style="list-style-type: none"> build rapport, trust, group cohesion, and ease anxieties
Warm-up	<ul style="list-style-type: none"> physical warm-up (e.g., stretches and warm up activities) mental warm up (e.g., intention setting, why hunting, centering, breath work) 	<ul style="list-style-type: none"> prepare participants mentally and physically for the session's activities
Skill learning	<ul style="list-style-type: none"> physical skill development for the sport of the day (e.g., passing, technique, rules, etc) mental skill development relevant to the sport of the day (e.g., goal setting, self-talk, etc) 	<ul style="list-style-type: none"> teach relevant skills and rules to increase participants' competence and self-efficacy in the activities teach mental skills relevant to learning and executing the session activities provide opportunity for physical activity provide opportunity for semi-structured social interaction
Skill execution/play	<ul style="list-style-type: none"> participants execute/practise physical/mental skills in competitive drill/game setting facilitators reinforce opportunities to utilise mental and physical skills 	<ul style="list-style-type: none"> provide opportunity for the participants to practise new skills, and to demonstrate competence build group cohesion through opportunities to work together through a common goal provide opportunity to pair mental and physical skills provide opportunity for physical activity provide opportunity for semi-structured social interaction
Cool down/debrief	<ul style="list-style-type: none"> physical cool down (e.g., stretching, walking) mental cool down (e.g., breath work, meditation, reflection, group debrief including application to other areas of life) 	<ul style="list-style-type: none"> provide opportunity to reflect on activities and transfer learnings to other areas of life
Closing	<ul style="list-style-type: none"> informal social time food and hydration 	<ul style="list-style-type: none"> provide opportunity for informal social interaction
Alternate activities	<ul style="list-style-type: none"> observing journaling lawn bowling 	<ul style="list-style-type: none"> provide opportunities for graded participation meet needs of individual

	<ul style="list-style-type: none"> • ring toss 	<ul style="list-style-type: none"> • support autonomy through participant led engagement
Data collection during sessions	<ul style="list-style-type: none"> • attendance • engagement of participants in various phases (as observed and recorded by facilitators) • feedback from support workers and participants (during sessions and during the week between sessions) • facilitator reflection (good, better, how) 	<ul style="list-style-type: none"> • assess feasibility • assess acceptability • test intervention components • support an iterative approach; adjust sessions throughout according to feedback and reflections • collect feedback to inform future similar work • support autonomy through participant design element
Facilitator Reflection	<ul style="list-style-type: none"> • good, better, how approach <ul style="list-style-type: none"> ○ RE: outcomes, logistical, design, overall (timing, progression, engagement, level, interaction, food, breaks, adverse events) 	<ul style="list-style-type: none"> • to promote reflection, share observations, and begin to plan modifications for next week

We subsequently made plans for program materials (e.g., equipment lists, specifications of materials required, training materials collected). The planning team selected relevant measurements and assessments, created recruitment documents, constructed documents and interview guides for participant feedback collection, and developed risk management plans to ensure physical and psychological safety. Please see the supporting information for a pre intervention wellness plan (File S4.1), weekly participant questionnaire (File S4.2), and post intervention interview guides (File S4.3). These measurements and documents were essential to smooth execution of the program and key requirements of the ethics approval application. Facilitators with expertise in coaching, sport psychology, and/or early intervention in psychosis were selected to run the program. Facilitators completed a one-hour psychosis education training session with a member of a research team who is an expert early psychosis. Training session topics included psychoeducation about what psychosis is, what to expect when working with young people with FEP, how to provide support,

and question/discussion time. Facilitators also completed first aid qualifications if necessary. Together with the planning group and with the continual feedback of the service partner, the facilitators developed weekly session plan outlines, with the intention to update outlines with relevant modifications as the intervention progressed. Specialists were consulted when necessary to ensure physical and psychological safety (e.g., a dietician for the hydration/snack/food plan, an exercise physiologist for the warm-up and cool down guidelines). A sample weekly session plan can be found in Table S4.2. To ensure the safety of the participants and to maximise engagement, it was decided that all recruitment will be done through the service partner, and the clinical care team of each participant will deem them physically and psychologically able to participate. With the permission of the participants, mobile technology (email, text, phone call) will be utilised (e.g., reminders for sessions) to maximise adherence.

4.2.5. Step 5: Program implementation.

The penultimate phase in intervention mapping is to develop program implementation plans. Key tasks in this step include identifying potential program users, developing outcomes and performance objectives for program use, and designing relevant implementation intervention plans. As this study will be a feasibility and pilot study that will not yet been implemented by others, this step is not immediately relevant for the purposes of the current study. However, it is important to reflect on potential future implementation options, especially considering a program goal is to “develop a sustainable program that can evolve within the community.” As such, it is critical that a detailed record is kept regarding how the intervention is delivered and any modifications made as a result of observations or feedback. Additionally, it is imperative that a record of the benefits and challenges of collaborating with the service partner is maintained, and that the service partner provides feedback on the sustainability of supporting such programs in the future.

4.2.6. Step 6: Evaluation plan.

The final step in intervention mapping is to develop an evaluation plan. The overarching goal of the evaluation will be to assess the feasibility and acceptability of a sport-based, life skills program to support the recovery of young people with FEP. To accomplish this goal, recruitment statistics, attendance records, observational notes on engagement, feedback from participants and the service

partner (through questionnaires and semi-structured interviews), facilitator reflections/observational notes, and measurement results and measurement engagement records will be analysed. This data will be assessed using the MRC's process evaluation framework to evaluate the implementation, mechanisms of impact, and context of the study (Craig et al., 2008). Specifically, the collected data will be employed to explore the context (e.g., socio-economic factors), reach (e.g., subgroups who do not participate), dose (e.g., proportion of planned intervention received), fidelity (e.g., intervention components delivered as intended), and acceptability (e.g., participants' receptiveness to trial materials and processes) of the study. In addition, Bowen and colleagues' (2009) guidelines for feasibility studies will be utilised in the evaluation. More specifically, the evaluation will focus on the outcomes of acceptability, demand, implementation, practicality, adaptation, integration, expansion, and limited efficacy.

4.3. Discussion

We report the utilisation of an intervention mapping approach to develop systematically a sport program designed to foster functional recovery (through physical activity, social connectivity, and life skills training) for young people with FEP. The process began with a needs assessment that provided an understanding of the problem (i.e., low functional recovery levels in young people with FEP, Brooke et al., 2019b [chapter 2]) and an exploration of stakeholder opinions on the potential of sport as a part of the solution (Brooke et al., 2019a [chapter 3]). We subsequently conducted an in-depth analysis of the outcomes and objectives needed for change, and specific change methods and relevant practical application strategies. The systematic process culminated in an evidence-based framework for a feasibility and pilot study. A hybrid approach combining both feasibility and pilot study elements will enable the assessment of feasibility factors such as acceptability and practicality (Bowen et al., 2009; Eldridge et al., 2016), in addition to the piloting of specific intervention components (Arain et al., 2010; Eldridge et al., 2016).

The intervention design resulting from the IM process has both a strong theoretical and practical foundation. Its structure is based on tested methods to produce health-related change in general (Kok et al., 2016) and specifically related to functional recovery in FEP (Woodhead & Monson, 2013). This structure was then enhanced by design details informed by stakeholder opinions and feedback.

Although the intervention design builds on existing work, it is novel in many ways. First, to our knowledge, this study is the first in which: 1) IM has been utilised with FEP, 2) a sport-based intervention to promote physical activity has been designed specifically for FEP recovery, and 3) a sport-based life skills training framework has been applied to FEP. These novelties mean that this intervention format differs considerably from the majority of physical activity-based FEP recovery efforts, which tend to be one-dimensional in that they focus predominantly on physical health outcomes (e.g., Firth et al., 2016 a,b,c), rather than functional recovery outcomes such as social connectivity and life skills development. Key strengths of the intervention design produced in the current study are the rigorous attention given to the needs of young people with FEP, the involvement of the stakeholders throughout the process, and the multidimensional recovery options provided in a normalising and engaging manner. Moreover, the use IM is a strength of the current study as the process yielded a level of detail in the intervention components that will allow for meaningful evaluation and application to future research and practice.

The intervention design also comes with limitations. As addressed within the qualitative portion of the needs assessment (Brooke et al., 2019a [chapter 3]), the specific needs reported by the young people with FEP and their clinicians may vary from those in other regions or with different demographics. The utilisation of IM, particularly the needs assessment phase, would help future designs capture and target different cultural preferences. In addition, the needs assessment conducted did not include consultation with family and carers as key stakeholders, which may have limited the understanding of this population's needs. Furthermore, the limited existing research in the use of sport for young people with FEP must be considered when interpreting the results of the IM process. This framework presented in this paper serves as a starting point but will be strengthened with testing.

This study serves as an important foundation for sport-specific recovery efforts within FEP. Next steps include implementation and evaluation of the feasibility and pilot study, which could then inform future larger scale interventions and/or clinical application. Elements of this study (e.g., general barriers/enablers to engagement) may be applicable to non-sport specific FEP recovery efforts, especially including the use of the widely accepted IM framework and its utility in catering to the specific needs of this vulnerable population.

4.4. Supplementary Materials

Table S4.1. *Matrices of Change Objectives, Evidence Based Change Methods, and Practical Application**Sport-Based Life Skills Training for Young People with FEP*

Behavioural Outcome	Performance Objective	Personal Determinant	Source of evidence/theory-based change method	Method and/or related theory	Definition	Practical applications
1) Participant attends program	PO.1.1 Arrange transport	Knowledge: K.1.1 Understand transport options (public or otherwise) K.1.1b Understand resources needed for transport and how to access them (e.g., transport voucher)	Needs assessment interviews (Brooke et al., 2019b); Therapeutic Group Work for Early Psychosis (Woodhead & Monson, 2013)	Transport mapping	Individual receives support in transport mapping and in practicing transport plan	Program encourages case workers to go through transport mapping plan with young person, and accompanies young person on route at first if needed
		Self-efficacy: SE.1.1a Believe in ability to navigate transport plan, and manage problems SE.1.1b Believe in ability to overcome challenges (e.g. manage anxiety)	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Verbal persuasion (Social Cognitive Theory, Bandura, 1986; Theories of Self-Regulation; Kelder et al., 2015)	Using messages that suggest that the participant possesses certain capabilities.	Facilitators or support workers provide individualised positive feedback to participant regarding development and demonstrations of specific skills.
		Support: S.1.1 Ask for and/or receive support from family, peers, program, or mental health service with transport and/or transport planning/reminders	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Facilitation (Social Cognitive Theory; Bandura, 1986)	Creating an environment that makes the action easier or reduces barriers to action.	Peers, family, or mental health service provide transport; or program provides transport reimbursement
			A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message
			Needs assessment interviews (Brooke et al., 2019b)	Bring a friend	Participants are encouraged to “bring a friend” for support to the program	Program encourages young people to bring a peer (e.g., friend, sibling, partner, parent, case worker) along to the program to participate alongside them
		Outcome expectations: OE.1.1 Expect successful transport experience	Needs assessment interviews (Brooke et al., 2019b); Therapeutic Group Work for	Transport mapping	Individual receives support in transport mapping and in practicing transport plan	Program encourages case workers to go through transport mapping plan with young person, and accompanies young person on route at first if needed. Potential

			Early Psychosis (Woodhead & Monson, 2013)			challenges (e.g., anxiety, delay) should be worked through ahead of time, and reflected on after
PO.1.2 Feel supported in attending	Knowledge: K.1.2 Understand resources available	Needs assessment interviews (Brooke et al., 2019b); Therapeutic Group Work for Early Psychosis (Woodhead & Monson, 2013)	Transport mapping	Individual receives support in transport mapping and in practicing transport plan	Program encourages case workers to go through transport mapping plan with young person, and accompanies young person on route at first if needed. Potential challenges (e.g., anxiety, delay) should be worked through ahead of time, and reflected on after	
		Needs assessment interviews (Brooke et al., 2019b)	Transport reimbursement	Individual receives voucher or otherwise for transport costs	Program provides vouchers and/or travel cards, and explains this resource clearly to potential participants	
	Self-Efficacy: S.E.1.2 Believe in ability to ask for and receive support	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Verbal persuasion (Social Cognitive Theory, Bandura, 1986; Theories of Self-Regulation; Kelder et al., 2015)	Using messages that suggest that the participant possesses certain capabilities.	Facilitators or support workers provide support and individualised positive feedback to participant when they seek support.	
	Support: S.1.2 Ask for and/or receive support from family, peers, program, or mental health service	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.	
			Facilitation (Social Cognitive Theory; Bandura, 1986)	Creating an environment that makes the action easier or reduces barriers to action.	Peers, family, or mental health service provide transport; or program provides transport reimbursement	
	Outcome Expectations: OE.1.2 Expect that participants will be supported in challenges and successes by program, mental health service, peers, family, etc	Needs assessment interviews (Brooke et al., 2019b)	Bring a friend	Participants are encouraged to “bring a friend” for support to the program	Program encourages young people to bring a peer (e.g., friend, sibling, partner, parent, case worker) along to the program to participate alongside them	
PO.1.3 Feel autonomously motivated to attend	Knowledge: K.1.3 Understand the benefits of program (sport, life skills, and social connection)	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants during intake interview. Encourage participants to ask questions throughout the duration of the program.	
		Self-Efficacy: SE.1.3a Believe in ability to complete program requirements	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related	Motivational interviewing, MI (Self-determination theory; Theories of self-regulation; Miller	Providing a collaborative, goal-oriented style of communication with particular attention to the	Communicate with participant about motivations, goals, and concerns during intake interview. Collaboratively assess

		SE.1.3b Believe in ability to manage challenges (e.g manage symptoms, cope with anxiety) SE. 1.3c Believe in ability to benefit from program	theory, and definition taken directly from the supplementary materials from this source)	& Rollnick, 2012; Ng et al., 2012; Ryan & Deci, 2000)	language of change; designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reasons for change within an atmosphere of acceptance and compassion.	participant's willingness to engage and change, and provide support
				Verbal persuasion (Social Cognitive Theory; Theories of Self-Regulation; Kelder et al., 2015)	Using messages that suggest that the participant possesses certain capabilities.	Facilitators provide individualised positive feedback to participants regarding development and demonstration of specific skill.
				Self-affirmation (Self-Affirmation Theory; Cohen & Sherman, 2014)	Increasing people's self-image by having them elaborate on their relevant values or desirable characteristics.	During the intake interview, ask participants about their motivation to attend and what they can contribute to the program.
		Support: S.1.3 Family, peers, and mental health service encourages attendance (e.g., offering support, acknowledging negative emotions and challenges)	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide support logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.
				Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants' support network. Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message
		Outcome Expectations: OE.1.3a Expect that the program will be enjoyable and produce benefits. OE.1.3b Believe that the positives outweigh the negatives OE.1.3c Expect of a safe and non-judgemental atmosphere	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Tailoring (Trans-Theoretical Model; Precaution Adoption Process Model; Protection Motivation Theory; Communication-Persuasion Matrix; Lustria, Cortese, Noar, & Glueckauf, 2009; McGuire, 2012; Weinstein, Sandman, & Blalock, 2008; Werrij, Ruiters, van't Riet, & de Vries, 2012)	Matching the intervention or components to previously measured characteristics of the participant.	(i) Collect information about individual needs and preferences during intake interview and modify session accordingly (ii) (ii) Collect feedback from participant and support worker throughout program and modify sessions accordingly
				Individualization (L K Bartholomew et al., 2000; L. K.	Providing opportunities for learners to have personal	Work to build rapport with each individual; approach them and provide

				Bartholomew, Czyzewski, Swank, McCormick, & Parcel, 2000; Prochaska, Redding, & Evers, 2015)	questions answered or instructions paced according to their individual progress.	opportunity to ask questions. Plan weekly sessions with individuals in mind, and provide constraints/options for varying ability.
				Use of lay health workers; peer education (Theories of Social Networks and Social Support; Models of Community Organization; Tolli, 2012)	Mobilizing members of the target population to serve as boundary spanners, credible sources of information, and role models.	Invite peer support workers (with a lived experience of psychosis) to participate alongside participants to offer support and model engagement
			Needs assessment interviews (Brooke et al., 2019b)	Normalised environment	Environment feels normal to participants, rather than research or mental health focused	(i) Facilitators participate alongside participants (ii) Case workers and peers participate alongside participants and receive same treatment by facilitators (iii) Focus is on sport, with subtle inclusion of life skills (iv) Facilitators/researchers assume the role of coach/participant, rather than an observer taking notes
2) Participant engages with program behaviourally, cognitively, and emotionally	PO.2.1 Engage in physical skills development and sport activity	Knowledge: K.2.1 Understand rules and components of sport activity	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Modeling (Social Cognitive Theory; Theories of Learning; Kazdin, 2008; Kelder et al., 2015)	Providing an appropriate model who can reinforce the desired action.	Facilitators to provide model of skill and participation. It is important that facilitators with low skill levels also model participation.
				Providing cues (Theories of Information Processing; Godden & Baddeley, 1975)	Assuring that the same cues are present at the time of learning and the time of retrieval.	Use cues during the demonstration of a skill, and throughout the session (e.g., “follow through” when teaching basketball skills; use of “follow through” during skill execution phase)
		Self-Efficacy: SE.2.1a Believe in ability to engage in activity and develop sport skills SE.2.2b Believe in ability to manage challenges (e.g., manage symptoms, cope with anxiety)	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Use of lay health workers; peer education (Theories of Social Networks and Social Support; Models of Community Organization; Tolli, 2012)	Mobilizing members of the target population to serve as boundary spanners, credible sources of information, and role models.	Invite peer support workers (those with a lived experience) to participate alongside participants to offer support and model engagement
				Verbal persuasion (Social Cognitive Theory; Theories of Self-Regulation; Kelder et al., 2015)	Using messages to suggest that participants possess certain capabilities.	Facilitators provide individualised positive feedback to participants regarding development and demonstration of specific skill. Facilitators also encourage participants to provide positive verbal feedback to other participants (e.g., during cool down, instruct participants to find a partner and share one thing the other person did well in the session)

				Self-affirmation (Self-Affirmation Theory; Cohen & Sherman, 2014)	Increasing people's self-image by having them elaborate on their relevant values or desirable characteristics.	Encourage participants to verbalise or write down what they did well in a session, and/or what they contributed to the session.
		<p>Support: S.2.1a Peers, family, or mental health service encourage and reward engagement S.2.1b Feel supported by peers, program, and mental health service through successes and related challenges (e.g., anxiety)</p>	<p>A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)</p>	Individualization (L K Bartholomew et al., 2000; L. K. Bartholomew, Czyzewski, Swank, McCormick, & Parcel, 2000; Prochaska, Redding, & Evers, 2015)	Providing opportunities for learners to have personal questions answered or instructions paced according to their individual progress.	Work to build rapport with each individual; approach them and provide opportunity to ask questions. Plan weekly sessions with individuals in mind, and provide constraints/options for varying ability.
				Facilitation (Social Cognitive Theory; Bandura, 1986)	Creating an environment that makes the action easier or reduces barriers to action.	<ul style="list-style-type: none"> (i) Program encourages graded participation (e.g., gradual progression of activities, social interaction, and skill development; participants are encouraged to take breaks, engage in alternate activities, or sit out) (ii) Sessions are adjusted to individual skill level (use of constraints/modifications) (iii) Focus is on fun and social interaction, not performance or competition. (iv) Food and hydration is provided (v) "Challenge by choice" method utilised in which participants autonomously choose to engage
				Use of lay health workers; peer education (Theories of Social Networks and Social Support; Models of Community Organization; Tolli, 2012)	Mobilizing members of the target population to serve as boundary spanners, credible sources of information, and role models.	Invite peer support workers (with a lived experience of psychosis) to participate alongside participants to offer support and model engagement
		<p>Outcome Expectations: OE.2.1a Expect that sport activities will be enjoyable and produce benefits. OE.2.1b Believe that the positives outweigh the negatives OE.2.1c Expect a safe (physically and psychologically) and non-judgemental atmosphere</p>	<p>A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)</p>	Tailoring (Trans-Theoretical Model; Precaution Adoption Process Model; Protection Motivation Theory; Communication-Persuasion Matrix; Lustria, Cortese, Noar, & Glueckauf, 2009; McGuire, 2012; Weinstein, Sandman, & Blalock, 2008; Werrij, Ruiters, van 't Riet, & de Vries, 2012)	Matching the intervention or components to previously measured characteristics of the participant.	<ul style="list-style-type: none"> (i) Collect information about individual needs and preferences during intake interview and modify session accordingly (ii) Collect feedback from participants and support workers throughout program and modify sessions accordingly

						(iii) "Challenge by choice" method utilised in which participants autonomously choose to engage
PO.2.2 Engage in life skills development	Knowledge: K.2.2 Understand components and benefits of life skill	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Modeling (Social Cognitive Theory; Theories of Learning; Kazdin, 2008; Kelder et al., 2015)	Providing an appropriate model who can reinforce the desired action.	Facilitators to provide model of skill and participation. It is important that facilitators with low skill levels also model participation.	
			Providing cues (Theories of Information Processing; Godden & Baddeley, 1975)	Assuring that the same cues are present at the time of learning and the time of retrieval.	Use cues during the demonstration of a skill, and use same cues throughout the session.	
	Self-Efficacy: SE.2.2a Believe in ability to learn life skills SE.2.2b Believe in ability to manage challenges (e.g., manage symptoms, cope with anxiety) SE.2.2c Believe in ability to gain benefits from life skills development	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Verbal persuasion (Social Cognitive Theory; Theories of Self-Regulation; Kelder et al., 2015)	Using messages that suggest that the participant possesses certain capabilities.	Facilitators provide individualised positive feedback to participants regarding development and demonstration of specific skill.	
	Support: S.2.2a Peers, family, or mental health service encourage and reward engagement S.2.2b Feel supported by peers, program, and mental health service through successes and related challenges (e.g., anxiety)	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide support logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.	
			Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants' support network. Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message	
	Outcome Expectations: OE.2.2a Expect that activities will be enjoyable and produce benefits. OE.2.2b Believe that the positives outweigh the negatives OE.2.2c Expect a safe and non-judgemental atmosphere	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Provide explanation of benefits of program activities in relation to individual's goals and recovery in general.	
			Tailoring (Trans-Theoretical Model; Precaution Adoption Process Model; Protection Motivation Theory; Communication-Persuasion Matrix; Lustria, Cortese, Noar, &	Matching the intervention or components to previously measured characteristics of the participant.	(i) Collect information about individual needs and preferences during intake interview and modify session accordingly (ii) Collect feedback from participant and support worker throughout	

				Glueckauf, 2009; McGuire, 2012; Weinstein, Sandman, & Blalock, 2008; Werrij, Ruiter, van't Riet, & de Vries, 2012)		program and modify sessions accordingly
	PO.2.3 Engage in social interaction	Knowledge: K.2.3a Understand how to effectively respond to social engagement K.2.3b Understand how to initiate social interaction K.2.3c Understand how to engage in social interaction K.2.3d Understand personal triggers, and how to cope with/manage anxiety	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Modeling (Social Cognitive Theory; Theories of Learning; Kazdin, 2008; Kelder et al., 2015)	Providing an appropriate model who can reinforce the desired action.	Facilitators to provide model of skill and participation.
		Self-Efficacy: SE.2.3a Believe in ability to socially interact successfully SE.2.3b Believe in ability to effectively respond to social engagement SE.2.3c Believe in ability to effectively initiate social interaction SE.2.3d Believe in ability to manage challenges (e.g., manage symptoms, cope with anxiety)	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Team building and human relations training (Organizational Development Theory; Cummings & Worley, 2015)	Grouping development activities based on the values of human potential, participation, and development.	Facilitate ice-breaker and team building activities in the introduction phase of the session. Gradually increase level of social interaction and dependence on others required.
		Support: S.2.2 a Peers, family, or mental health service encourage and reward engagement S.2.3 b Feel supported by peers, program, and mental health service within social interactions and related challenges (e.g., anxiety)		Verbal persuasion (Social Cognitive Theory; Theories of Self-Regulation; Kelder et al., 2015)	Using messages that suggest that the participant possesses certain capabilities.	Facilitators provide individualised positive feedback to participants regarding development and demonstration of specific skill.
		Support: S.2.2 a Peers, family, or mental health service encourage and reward engagement S.2.3 b Feel supported by peers, program, and mental health service within social interactions and related challenges (e.g., anxiety)		Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide support logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.
		Outcome Expectations: OE.2.3 Expect that socialising will be enjoyable and produce benefits. OE.2.3b Believe that the positives outweigh the negatives OE.2.3c Expect a safe and non-judgemental atmosphere	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants' support network. Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message
3) Participant develops life skills	PO.3.1 Develop/experience/demonstrate motivation,	Knowledge: K.3.1 Understand components and benefits of life skill	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken	Active learning ((Elaboration Likelihood Model; Social Cognitive Theory; Kelder, Hoelscher, & Perry, 2015; Petty et al., 2009)	Encouraging learning from goal-driven and activity-based experience.	Encourage active reflection of learning throughout session phases including introduction, breaks, and debrief. This reflection can be verbal, thought, or

	confidence, and/or self-regulation within the program context of program		directly from the supplementary materials from this source)			written. Provide workbooks and/or assign partners/groups for reflection
				Modeling (Social Cognitive Theory; Theories of Learning; Kazdin, 2008; Kelder et al., 2015)	Providing an appropriate model who can reinforce the desired action.	Facilitators to provide model of skill and participation. It is important that facilitators with low skill levels also model participation.
				Providing cues (Theories of Information Processing; Godden & Baddeley, 1975)	Assuring that the same cues are present at the time of learning and the time of retrieval.	Use cues during the demonstration of a skill, and use same cues throughout the session (e.g. “find your why” discussion during motivation training; reminder of “what’s your why?” during breaks)
		Self-Efficacy: SE.3.1a Believe in ability to learn and demonstrate life skills SE.3.1b Believe in ability to manage challenges (e.g., manage symptoms, cope with anxiety) SE.3.2c Believe in ability to gain benefits from life skills development	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Goal setting (Goal-Setting Theory; Theories of Self-Regulation; Latham & Locke, 2007)	Prompting planning what the person will do, including a definition of goal-directed behaviors that result in the target behavior.	Teach goal setting techniques and how to apply to skill. Prompt action toward reflection of development of skill during session.
	Verbal persuasion (Social Cognitive Theory; Theories of Self-Regulation; Kelder et al., 2015)			Using messages that suggest that the participant possesses certain capabilities.	Facilitators provide individualised positive feedback to participants regarding development and demonstration of specific skill.	
		Support: S.3.2 Feel supported in skill development and associated challenges/success	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide support logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.
		Outcome Expectations: OE.3.2a Expect that life skill will help recovery and other life aspects OE.3.2b Expect a safe and non-judgemental atmosphere		Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants’ support network. Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message
4) Participant transfers life skills to other contexts	PO.4.1 Develop/experience/demonstrate motivation, confidence, and/or self-regulation outside of program (e.g.,	Knowledge: K.4.1a Understand components and benefits of life skill K.4.1b Understand how to apply life skill to other contexts	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Active learning ((Elaboration Likelihood Model; Social Cognitive Theory; Kelder, Hoelscher, & Perry, 2015; Petty et al., 2009)	Encouraging learning from goal-driven and activity-based experience.	Encourage active reflection of learning throughout session phases including introduction, breaks, and debrief. This reflection can be verbal, thought, or written. Provide workbooks and/or assign partners/groups for reflection
				Modeling (Social Cognitive Theory; Theories of Learning; Kazdin, 2008; Kelder et al., 2015)	Providing an appropriate model who can reinforce the desired action.	Facilitators model engagement in reflection exercises, and provide own personal examples.

	school, home, work)			Discussion (Theories of Information Processing; Petty et al., 2009)	Encouraging consideration of a topic in open informal debate.	Encourage group discussion and reflection of how to apply skill outside of program.
			Definition and model of life skills transfer (Pierce, Gould, & Camire, 2017).	Life skills transfer support	Transfer occurs with: (i) similarity of context, (ii) opportunities to use skills, (iii) support for transfer, and (iv) rewards for transfer	<ul style="list-style-type: none"> (i) similarity of context (e.g., encourage reflection of similar contexts in which to use the skill- e.g., what other recovery programs could you apply the motivation you felt in this program to? (ii) opportunities to use skills (e.g., prompt discussion and reflection about where else in life skill may be useful; follow up in subsequent sessions) (iii) support for transfer (encourage case workers to provide support for the transfer process) (iv) rewards for transfer (provide positive verbal feedback when participant reports transfer of skills, and encourage case workers to do the same; prompt participant to think about the benefits of using this skill)
	Self- Efficacy: SE.4.1a Believe in ability to apply life skills to other contexts SE.4.1b Believe in ability to manage challenges (e.g., manage symptoms, cope with anxiety) SE.4.1c Believe in ability to gain benefits from life skills application	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Goal setting (Goal-Setting Theory; Theories of Self-Regulation; Latham & Locke, 2007)	Prompting planning what the person will do, including a definition of goal-directed behaviors that result in the target behavior.	Teach goal setting techniques and how to apply to skill. Prompt action toward reflection of development of skill during session.	
			Verbal persuasion (Social Cognitive Theory; Theories of Self-Regulation; Kelder et al., 2015)	Using messages that suggest that the participant possesses certain capabilities.	Facilitators provide individualised positive feedback to participants regarding development and demonstration of specific skill.	

		<p>Support: S.4.1 Family, peers, and clinical team encourage application of life-skills outside of program</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide support logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.
		<p>Outcome Expectations: OE.4.1 Expect that life skill will help recovery and other life aspects</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants' support network. Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message
5) Participant develops Physical/Sport Skills and Increase Physical Activity	PO.5.1 Demonstrate increased sporting/physical skills ability	<p>Knowledge: K.5.1 Understand rules and components of sport activity</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Active learning ((Elaboration Likelihood Model; Social Cognitive Theory; Kelder, Hoelscher, & Perry, 2015; Petty et al., 2009)	Encouraging learning from goal-driven and activity-based experience.	Encourage active reflection of learning throughout session phases including introduction, breaks, and debrief. This reflection can be verbal, thought, or written. Provide workbooks and/or assign partners/groups for reflection
				Modeling (Social Cognitive Theory; Theories of Learning; Kazdin, 2008; Kelder et al., 2015)	Providing an appropriate model who can reinforce the desired action.	Facilitators to provide model of skill and participation. It is important that facilitators with low skill levels also model participation.
		<p>Self- Efficacy: SE.5.1a Believe in ability to engage in activity and develop sport skills SE.5.1b Belief in ability to manage challenges (e.g., manage symptoms, cope with anxiety)</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Goal setting (Goal-Setting Theory; Theories of Self-Regulation; Latham & Locke, 2007)	Prompting planning what the person will do, including a definition of goal-directed behaviors that result in the target behavior.	Teach goal setting techniques and how to apply to skill. Prompt action toward reflection of development of skill during session.
		<p>Support: S.5.1 Peers, family, or mental health service encourage and reward engagement and progression</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide support logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.

		<p>Outcome Expectations: OE.5.1a Expect that sport activities will be enjoyable and produce benefits. OE.5.1b Believe that the positives outweigh the negatives OE.5.1c Expect of a safe and non-judgemental atmosphere</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants' support network. Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message
PO.5.2 Demonstrate increase in physical activity habits (within and/or outside of program)		<p>Knowledge: K.5.2a Understand benefits of physical activity 5.5.2b Understand how to warm up and cool down the body</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Active learning ((Elaboration Likelihood Model; Social Cognitive Theory; Kelder, Hoelscher, & Perry, 2015; Petty et al., 2009)	Encouraging learning from goal-driven and activity-based experience.	Encourage active reflection of learning throughout session phases including introduction, breaks, and debrief. This reflection can be verbal, thought, or written. Provide workbooks and/or assign partners/groups for reflection
		<p>Self- Efficacy: SE.5.2a Believe in ability to engage in activity and develop sport skills SE.5.2b Believe in ability to manage challenges (e.g., manage symptoms, cope with anxiety) SE.5.2c Believe in ability to make physical activity habitual</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Goal setting (Goal-Setting Theory; Theories of Self-Regulation; Latham & Locke, 2007)	Prompting planning what the person will do, including a definition of goal-directed behaviors that result in the target behavior.	Teach goal setting techniques and how to apply to skill. Prompt action toward reflection of development of skill during session.
				Self-monitoring of behavior (Theories of Self-Regulation; Creer, 2000; Harkin et al., 2016)	Prompting the person to keep a record of specified behavior(s).	Encourage participants to keep a record of steps taken in each session (provide pedometers).
		<p>Support: S.5.2 Peers, family, or mental health service encourage and reward engagement and progression</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Mobilizing social networks (Theories of Social Networks and Social Support; Social norm theories; Valente, 2012)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Encourage family, peers, and peer workers to provide support logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message.
		<p>Outcome Expectations: OE.5.2a Expect that sport activities will be enjoyable and produce benefits. OE.5.2b Believe that the positives outweigh the negatives OE.5.2c Expect a safe and non-judgemental atmosphere</p>	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Convey benefits of program to participants' support network. Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message

PO.5.3 Demonstrate increased physical fitness	Knowledge: K.5.3a Understand benefits of physical activity 5.5.2b Understand how to warm up and cool down the body	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Active learning ((Elaboration Likelihood Model; Social Cognitive Theory; Kelder, Hoelscher, & Perry, 2015; Petty et al., 2009)	Encouraging learning from goal-driven and activity-based experience.	Encourage active reflection of learning throughout session phases including introduction, breaks, and debrief. This reflection can be verbal, thought, or written. Provide workbooks and/or assign partners/groups for reflection
	Self- Efficacy: SE.5.3a Believe in ability to engage in physical activity SE.5.3b Believe in ability to increase physical fitness	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Goal setting (Goal-Setting Theory; Theories of Self-Regulation; Latham & Locke, 2007)	Prompting planning what the person will do, including a definition of goal-directed behaviors that result in the target behavior.	Teach goal setting techniques and how to apply to skill. Prompt action toward reflection of development of skill during session.
	Support: S.5.3 Peers, family, or mental health service encourage and reward engagement and progression	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message	Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message	Encourage family, peers, and peer workers to provide logistical and emotional support. Flyers, phone calls, meetings, and letters can be used to convey the message
	Outcome Expectations: OE.5.4a Expect that physical activity will be enjoyable and produce benefits. OE.5.4b Believe that the positives outweigh the negatives	A taxonomy of behaviour change methods: an Intervention Mapping Approach (Kok et al., 2016) (*note: method, related theory, and definition taken directly from the supplementary materials from this source)	Persuasive communication (Communication-Persuasion Matrix; Elaboration Likelihood Model; Diffusion of Innovations Theory; McGuire, 2012; Petty, Barden, & Wheeler, 2009; Rogers, 2003)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Provide explanation of benefits of physical activity in relation to individual's goals and recovery in general.

Note. Please see Bartholomew Eldredge et al. (2016) for further clarification on table construction and purpose. Table is displayed at the individual level of the participants, and environmental levels are embedded within the determinant (support) and practical application section.

Table S4.2. *Session 1 Outline*

Session 1: Basketball (indoor)				
<i>Key Session Outcomes:</i> 1) Building rapport; 2) Physical activity; 3) Social interaction; 4) Skill development / confidence				
<i>Materials needed:</i> basketballs (10-20), ball pump, cones (30), bibs (20), first aid kit, alternative activities (e.g., ring toss, skittles, beach bats), water, snacks, speaker				
<i>Note:</i> Facilitators are to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities				
PHASE	TIMING	KEY COMPONENTS TO TARGET	ACTIVITIES	KEY TEACHING/FACILITATING POINTS
INTRODUCTION ICE BREAKER(S)	20 min	<ul style="list-style-type: none"> • set expectations • build comfort/familiarity with group and program • get to know names 	<ul style="list-style-type: none"> • Acknowledgement of country: <ul style="list-style-type: none"> ○ “We wish to acknowledge the traditional custodians of the land we are meeting on, the Whadjuk people. We would like to acknowledge the strength, resilience and capacity of Noongar people in this land.” • Introduction (introduce facilitators) • Housekeeping <ul style="list-style-type: none"> ○ toilets, water, snacks, other activities, breaks, structure of session • Ice breakers <ul style="list-style-type: none"> ○ 1. this or that: create a line on the court with cones, present opposing preferences and have people go to one side of the line 	<p>Run by 1 facilitator, others participate</p> <p>Facilitators to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities</p>

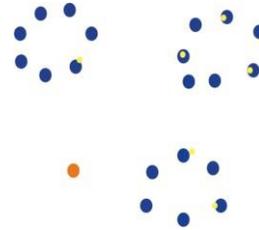
			<p>or the other depending on their preference(dogs or cats; vanilla or chocolate; coffee or tea; Eagles or Dockers; summer or winter; sunrise or sunset; hamburger or hot dog, tomato or tomato; rover or ocean; Nutella or peanut butter)</p> <ul style="list-style-type: none"> ○ 2. ball pass/name game (say name and fav sport/team) ● Ground rules/expectations (group discussion with whiteboard; have group come up with list and prompt if any of the below aren't discussed) <ul style="list-style-type: none"> ○ Respect ○ Listen to your body/needs ○ Support others ○ Give it a go/challenge by choice ○ Come in the right mind (sober) ● Set Up <ul style="list-style-type: none"> ○ watches ○ workbooks (name on outside; inside: one thing you hope to get out of the session; # of steps you think you might do in today's session) 	
PHYSICAL WARM UP	10 min	<ul style="list-style-type: none"> ● elevated heart rate ● movement in major muscle groups ● social interaction/familiarity 	<ul style="list-style-type: none"> ● Dynamic movement and activities <ul style="list-style-type: none"> ○ Pairs: <ul style="list-style-type: none"> ▪ HSNT/Cone: (best $\frac{2}{3}$): In pairs with 1 cone per pair. Facilitator calls out "head, shoulders, knees, toes, cone" in random order. Participants are to touch different parts 	Run by 1 facilitator, others participate or engage with those on sideline

		<ul style="list-style-type: none"> • priming for physical skills required for day (e.g., hand-eye coordination, reflexes, spatial awareness) 	<p>on their own body when called. When “cone” is called, participants compete to grab the cone first.</p> <ul style="list-style-type: none"> ▪ Tennis ball reflex challenge: In pairs with 2 tennis balls per pair. Partners face each other 1.5 arm length apart. One partner holds 2 tennis balls out in front at shoulder height with arm extended; other partner stands with hands behind back. Partner with balls randomly drops 1 ball; goal is for other partner to catch ball before it hits the ground. Challenge; drop 2 balls at once <ul style="list-style-type: none"> ○ Group: <ul style="list-style-type: none"> ▪ Chasing game: “Bib Tag”. Two players attempt to catch group members (‘runners’) by throwing a soft bib they each possess. If a player is caught they stand ‘stuck’ at that point until another runner releases them by tapping them on the shoulder. ▪ The area played in is relative to the size of the group allowing enough space for players to move safely without collision. (e.g., 10 players = 25m x 25m area). ▪ Progression of the game - Once a runner is caught, instead of becoming stuck they go to pick up a spare bib and join the initial tagger(s) in catching remaining runners. <p>*To adjust the challenge the following adaptations were made where needed:</p> <ul style="list-style-type: none"> ▪ For those struggling: 	
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			<ul style="list-style-type: none"> • Inclusion of rest zone to the side of playing area that could be used when needed <ul style="list-style-type: none"> ○ Provide individual players with a small cone that may be used as a shield to deflect bibs that are thrown towards them. ▪ For those striving: <ul style="list-style-type: none"> • Constraining their movement style. (e.g., instead of running freely, they must sidestep or race walk) • Providing a ‘balance hat’ in the form of a small cone. The player must keep this on their head without using their hands whilst moving around the area. 	
(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation (water, electrolytes, snacks available).		
SKILL LEARNING	20 min	<ul style="list-style-type: none"> • Shooting • Passing • Dribbling 	<p>Basketball confidence meter: “How’s your basketball confidence?” Create a line of cones going from red to yellow to green; have participants and facilitators line up according to their basketball confidence/experience- red being low confidence/experience; green being high.</p> <p>Passing introduction: Players are each numbered from 1 to n within small groups (e.g., 4-6 players). Players start by passing in order (i.e., 1 to 2, 2 to 3,</p>	<ul style="list-style-type: none"> • Run by 1 facilitator; others participate or engage with those on sideline • Can be creative and adaptive levels

etc.) Players are then instructed to move ball around in a chest pass, bounce pass, and overarm passing techniques.

Progression: Instructions are then called out that all groups follow while still passing. (1) Reverse = reverse the passing order (e.g., 3 to 2, 2 to 1 etc.). (2) Switch= move your ball to the next group clockwise (3) Rotate = move your whole group to change position with another group.



Shooting Challenges: In pairs, players take a ball and hoop and find a safe space in the hall to practice the below levels in order. Once they have mastered the level successfully (i.e., consistent completion), they move on to the next. Each pair can be at a different level to the others within the group.

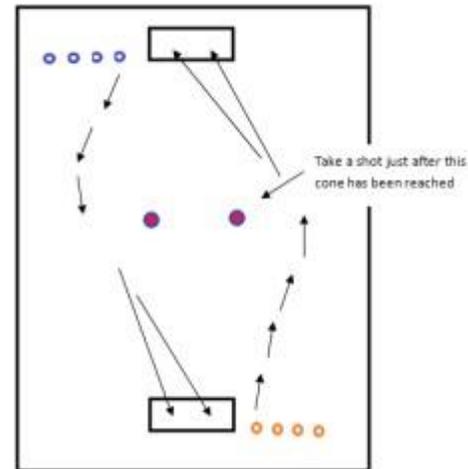
<p>1. Shoot to land in partner's hands</p>	<p>2. Shoot over partner (arms by sides) into hoop 2m away</p>	<p>3. As before but partner can now raise arms to block.</p>	<p>4. Partner can now jump to block also.</p>	<p>5. Both players now have hoops and play 1v1 game.</p>	<p>6. Players then use hoop to practice 1v1 shooting.</p>

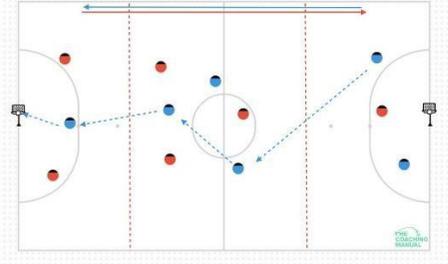
to make harder/easier.

Contingency game ideas:

If participants find the paired shooting challenges too easy or prefer a group based game:

Shooting Alamo: Two queues start at either end of the court. One at a time players dribble up to a cone and attempt to shoot into the hoop (distance of cone from hoop can be adjusted to adapt challenge). Once a player has shot they retrieve their ball and join the opposite queue and wait to shoot down the opposite end. The players try to score as many times in a set period of time.



(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation (water, electrolytes, snacks available).	
PLAY	30 min	<ul style="list-style-type: none"> • skill execution/ demonstration • teamwork/social interaction 	<p>Zone ball</p> <p>Players are organised into two even teams on a regular basketball court with players spread across three separate zones (see figure below). The aim is of the game is to score by throwing the ball through the hoop their team is attacking. The following rules are applied to allow players to adapt to the challenge:</p> <ol style="list-style-type: none"> 1. Players cannot move with ball and must stay in zone (passing between each other only) 2. Players can now move three steps when in possession of the ball but must still remain in their zone. 3. Players can now move into the zone closest to them if they pass the ball into that zone. 4. Players can now move freely (no step limit) with their zone and with step 3 still applied. <ul style="list-style-type: none"> • Finally, players move into a regular basketball game and are able to move freely between all zones with no constraint on steps taken.  <p>*To adjust the challenge the following adaptations were made where needed:</p>

- Run by 2 facilitators, other participants or engages with those on sideline
- Provide opportunities for graded participation if necessary

			<p>Struggling</p> <ul style="list-style-type: none"> ● 3m safe zone = opposition players must stay 3 steps back from player in possession. ● Add neutral player to support attacking team. The team with the ball will always therefore have an extra player. ● Retreat rule. = opposition must move back to their half when ball is played from baseline. <p>Striving</p> <ul style="list-style-type: none"> ● Three second rule = these players are only allowed to possess the ball for three seconds at a time. ● Constrain advanced players to dribble with only less dominant hand. 	
(BREAK)	3 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation (water, electrolytes, snacks available).		
COOL DOWN/DEBRIEF	10 min	<ul style="list-style-type: none"> ● lower heart rate ● catch breath ● stretch major muscle groups ● begin habit of reflection 	<ul style="list-style-type: none"> ● Find someone to walk with to the other side of the court and back and share your favourite part of the session ● Hamstring stretches- grass grazers (step forward while sweeping arms toward ground) ● Reach arms up (deep breath in)/ reach to toes/knees/shins (breath out) x 3 ● Repeat confidence meter and have participants compare to where they were at the beginning of session 	Run by 1 facilitator; others to fetch food out of refrigerator and set up

SOCIAL TIME/ SNACKS	15-20 min	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily 	light snacks (i.e., wraps, sandwiches, fruit) and water/electrolytes available	<ul style="list-style-type: none"> • Ask participants to return watches and record steps taken • Distribute vouchers • Facilitators to engage young people in casual conversation
FACILITATOR REFLECTION	30 min (post session)	<ul style="list-style-type: none"> • good, better, how approach • to promote reflection and begin to plan modifications for next week 	<ul style="list-style-type: none"> • Good, better, how: <ul style="list-style-type: none"> ○ RE: outcomes, logistical, design, overall (timing, progression, engagement, level, interaction, food, breaks, adverse events) • What went well? • What could be better and how? • How were the program components in relation to skill level? • How was the flow? • How was the timing? • How were the engagement levels? • How was interaction with the participants? • How did the team manage adverse events? • What modifications need to be made for next week? 	

File S4.1. *Wellness Plan*

<p>WELLNESS PLAN: Sport and Psychosis Study Thank you for agreeing to take part in the Sport and Psychosis study. We hope that you can share some information that might help us support you during your experience in this study. This information will be shared with the research team so that we can best support you.</p>
<p>PERSONAL DETAILS: NAME: EMERGENCY CONTACTS Who would you like us to contact if you need support? NAME: RELATION TO YOU: PHONE NUMBER(S):</p>
<p>HEALTH INFORMATION ALLERGIES Please list any known allergies (food, medication, insects or otherwise)</p> <p>MEDICATION Please list any medications that you are taking:</p> <p>MEDICAL CONDITIONS Do you have any medical or physical conditions? (ex: Asthma, Epilepsy) Yes <input type="checkbox"/> No <input type="checkbox"/> Please provide any details we may need to be aware of to support you</p> <p>DIETARY REQUIREMENTS Please list any specific dietary requirements below:</p>
<p>GENERAL Please provide details of any other relevant medical or mental health information we may need to be aware of:</p>
<p>LOOKING AFTER YOURSELF What sort of activities, tools, or resources do you use to help you relax?</p>
<p>HOW CAN WE HELP SUPPORT YOU?</p> <p>Are there any situations, activities, or topics that may make you uncomfortable, stressed, or may trigger your symptoms of being unwell?</p> <p>What are some of the signs and symptoms that you, or your family and friends would notice when you are becoming stressed or unwell?</p> <p>How would you like to be supported by the research team if you begin to feel stressed or unwell while participating in this study?</p> <p>Is there anything else you would like to share that could help us better support you?</p>

File S4.2. *Weekly Participant Questionnaire*

The following are questions about your experience today. All responses are confidential. You do not have to answer any questions that you would prefer not to. Thank you for your valuable time and feedback!

How did you attend today's session? (public transport, walk, cycle, ride from friend/family, etc.)	
Did anyone attend the session with you today? If so, who? (friend, family, peer support worker, partner, etc.)	
On a scale of 1-10, how enjoyable was today's session? (10 being the most enjoyable)	1 2 3 4 5 6 7 8 9 10
What was your favourite part of the session today?	
What was your least favourite part of the session today?	
On a scale of 1-10, how competent did you feel in today's session? (For example: feeling confident in your abilities, feeling skilled, being able to overcome challenges; 10 being the most competent)	1 2 3 4 5 6 7 8 9 10
On a scale of 1-10, how close to other people did you feel in today's session? (For example: feeling connected to others, feeling that you can trust those around you, caring for others and feeling cared for by them; 10 being the closest)	1 2 3 4 5 6 7 8 9 10
On a scale of 1-10, how much in control did you feel in today's session? (For example: participating willingly, having opportunities to make choices, having opportunities to give input; 10 being the most in control)	1 2 3 4 5 6 7 8 9 10
If applicable, what new skills did you learn in today's session?	
If applicable, what challenges did you overcome in today's session?	
Are any of the skills you learned or practised today useful in other parts of your life? (If yes, what skills, and where?)	
On a scale of 1-10, how likely are you to attend another session? (10 being the most likely)	1 2 3 4 5 6 7 8 9 10
Please provide any other feedback on how the program could be improved.	

File S4.3. *Post Intervention Interview Guides*

Peer and Community worker interview guide: The following questions will serve as a semi- structured guide to interview support workers of young people with psychosis/staff participants of the study. The goal of the interview or focus group is to get their feedback on the program. Follow up questions will be asked where appropriate to encourage the participant to elaborate and share their feedback. Other relevant questions regarding specific components of the intervention or situations that occurred will be asked as appropriate.

- 1) Open interview:
 - thank participant for coming
 - explain the goal of the interview
 - remind participant of option to withdraw or not answer any question
 - ask if the participant has any questions, and remind them that they can ask any question and any point
 - remind participant that the interview will be audio-recorded, and/or that notes will be taken
 - ask the support worker what their role at Ruah is (e.g., community worker, peer worker, etc)

- 2) Can you please tell me about your overall impression sport program?
 - What do you think what most useful?
 - What do you think could be better?
 - What components, if any, were most useful for your clients' recovery?
 - Do you feel that there were any components that inhibited, or slowed down the clients' recovery process? (Probe further if answer is yes; assess ways to manage this)
 - Do you feel that the pressure to attend put additional strain on those who didn't engage as much?
 - Can you tell me how participating in the program with your clients impacted your relationship with them?
 - What were your thoughts on having peer support workers, community workers, and young people all participating together? How did this impact on the group dynamics and your relationship with clients?

- 3) I'd like to talk about how motivated your clients were to attend the program:
 - What made it challenging for your clients to attend?
 - What made it easier for your clients to attend?
 - What made the difference for clients who were able to attend vs. those who weren't?
 - (Probe about logistical, psychological, psychosocial barriers and enablers)

- 4) I'd like to talk about how your clients attended the program.
 - What form of transportation did your clients use to attend the program?
 - How was this experience for them?

- If you provided transport, was this manageable within your functional recovery role? Do you think your clients would have attended without this support?
 - What would it have taken to for your clients to attend on their own?
- 5) Can you please provide me with feedback about program facilitators? (What worked well; what could be better?)
 - 6) During the session/program, we targeted a range of physical and mental skills. Can you please give me your thoughts on the appropriateness and effective of our methods? (Provide specific examples where necessary; e.g., use of breath work and heart rate monitors to target self-regulation).
 - 7) During the course of the intervention, your clients were asked to fill out questionnaires and measurements and provide feedback; can you tell me how you think this may have impacted their experience in the intervention?
 - 8) Can you please provide feedback on how the intervention catered to the specific needs of your clients? (Probe with follow up questions about psychological and physical safety)
 - 9) We know that stigma is a big issue within mental health. Can you please provide feedback on how normalised (or not) the intervention components felt?
 - 10) How likely is it that you would recommend a similar program to other young people recovering from psychosis?
 - 11) Is there any other feedback you would be willing to share about what worked well, or how the intervention could be improved?
 - 12) This program required a lot of support from you as a team, and we are so grateful. I think it's clear that participation would not have been the same without your support. I'd like to talk about the burden on the service, and how sustainable that kind of support would be moving forward?

Young person interview guide: The following questions will serve as a semi-structured guide to interview young people with psychosis about their overall experience in a sport program. The goal of the interview is to understand their experience in the program. The answers will be used to as part of a process evaluation of the pilot intervention, in an effort to inform the design of similar future work. Follow up questions will be asked where appropriate to encourage the participant to elaborate and share their experience.

- 1) Open interview:
 - thank participant for coming
 - explain the goal of the interview
 - provide and go over information and consent form
 - remind participant of option to withdraw or not answer any question
 - ask if the participant has any questions, and remind them that they can ask any question and any point
 - remind participant that the interview will be audio-recorded
 - ask the participant to provide their unique identifier:
- 2) Can you please tell me about your overall experience in the sport program?
 - What did you enjoy the most?
 - What were your least favourite components?
 - What components, if any, were most useful for your recovery?

- Do you feel that participating in the program inhibited, or slowed down your recovery process? (Probe further if answer is yes; assess for need to discuss with clinical care team)
 - What was it like participating with the workers from Ruah? (e.g. community and peer workers)
- 3) I'd like to talk about how motivated you were to attend the program.
 - What made it challenging to want to attend the program?
 - What made you feel more motivated to attend the program?
 - 4) I'd like to talk about how you attended the program.
 - What form of transportation did you use to attend the program?
 - How was this experience?
 - What were the challenges of transportation?
 - 5) Can you please tell me about your experience interacting with the program facilitators?
 - 6) Can you please tell me about your experience interacting with the other participants?
 - 7) I'd now like to talk about the skills you worked on in the program.
 - What, if any, physical skills or abilities do you think improved during the program?
 - What, if any, mental or psychological skills do you think improved during the program? (Probe specifically about motivation, confidence, and emotional regulation)
 - I'm wondering how you think these skills apply to other areas of your life? (probe about how they have or plan to apply them to other parts)
 - 8) During the course of the program, you were asked to fill out questionnaires and measurements- can you tell me about this experience? (probe about how this affected their participation/motivation)
 - 9) How likely is it that you would be interested in attending a similar program in the future?
 - 10) How likely is it that you would recommend a similar program to other young people recovering from psychosis?
 - 11) Is there any other feedback you would be willing to share about your experience or how the program could be improved?

Chapter 5: Enhancing Functional Recovery for Young People Recovering from First Episode Psychosis Via Sport-Based Life Skills Training: Outcomes of a Feasibility and Pilot Study

5.1. Introduction

A critical marker of recovery following a first episode of psychosis (FEP) is, in addition to symptom reduction, functional recovery. Early intervention efforts support functional recovery goals in several ways, some of which focus on increasing levels of 1) physical activity 2) life skills and 3) social connectivity. Sport has been proposed as an ideal platform to target these three goals simultaneously (Brooke, Lin, Ntoumanis, & Gucciardi, 2019 [chapter 2]). Young people who have experienced FEP and their clinicians supported the potential attractiveness and usefulness of a sport-based, life skills program for functional recovery (Brooke, Gucciardi, Ntoumanis, & Lin, 2019 [chapter 3]). However, there exists limited empirical evidence to implement such an intervention. Hence, the aim of the current study was to deliver and evaluate a feasibility and pilot study of a sport-based, life skills intervention for young people with FEP. The Medical Research Council (MRC) recommended that complex interventions be developed systematically, and any uncertainties be targeted through piloting (Craig et al., 2008). As such, the current study built on our preliminary work that utilised intervention mapping (Bartholomew Eldredge et. al., 2016, see chapter 4) to develop the content of the intervention. In the current study, we present the delivery of a six-week sport-based, life skills intervention for young people with FEP, and report a process evaluation with the goal to inform future work.

5.2. Methods

5.2.1. Research context.

We worked in collaboration with an early psychosis functional recovery service (herein referred to as ‘the service’) to conduct this study. We sought feedback from the service throughout the design, implementation, and evaluation phases of the study, and we conducted all recruitment through them. This service is located within the Perth metropolitan area but has a large catchment (over 900 square km.), including some semi-rural areas. During the final planning phases of the intervention (September 2018-February 2019), the service had just opened and begun accepting referrals from local early intervention services. Despite potential challenges

associated with a new service with a large catchment, we selected this service as a partner for two primary reasons. First, the goals of the intervention and the service were well aligned. Secondly, the service's willingness and ability to dedicate time, support, and feedback throughout all study phases was critical to ensure that we achieved our study aims.

5.2.2. Participants.

The target population was young people (referred to as 'young participants' herein) aged 16-25 years who had experienced a FEP in the past 12 months and were enrolled in the service. The goal was to enrol 5-15 young people, based on pragmatic feedback from the service. Exclusion criteria included (i) an inability to provide informed consent or complete the questionnaires/interviews due to insufficient language or cognitive capacity; (ii) being considered by the clinical care team as being unstable in symptomatology or unable to participate in physical activity; or to be a risk to self or others. Staff from the service (e.g., community workers and peer support workers, herein referred to collectively as 'staff participants') were recruited to participate alongside the young participants to provide logistical support, psychological safety support, and feedback on the program. Peer support workers are staff who have a lived experience of psychosis, and community workers are staff who work as the primary functional recovery care provider to clients of the service. We conducted all recruitment through the service. All participants provided informed consent.

5.2.3. Procedure.

5.2.3.1. Recruitment.

Community workers from the service referred eligible young people, and arranged home visits (with the researcher [me] and community worker) to obtain consent and complete the initial paperwork. During the home visits, young participants completed a physical activity screening questionnaire (ESSA, 2011) to assess readiness to participate in physical activity. They also completed a wellness plan (see chapter 4, file S4.1), which enabled the researcher to build rapport with prospective young participants, and to collect information about their specific needs, concerns, and goals. This information allowed our team to maximise psychological and physical safety for the young participants, and foster engagement with the program. Young participants were offered the option to complete three additional pre-assessment measurements: 1) the International Physical Activity Questionnaire

(IPAQ; Craig et al., 2011), selected for its utility in assessing physical activity levels in youth aged 15 and older, 2) the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS, Chen et al, 2015), selected to assess the satisfaction and frustration of the psychological needs for autonomy, competence, and relatedness, and 3) the Recovery Assessment Scale- Domains and Stages (RAS-DS; Hancock, Scanlan, Kightley, & Harris, 2019), selected for its ability to track mental health recovery outcomes. The measurements were given primarily to assess the feasibility of their inclusion in the intervention and subsequent impact on engagement, and as such were optional.

5.2.3.2. Intervention structure.

We ran a six-week intervention in which we used various sport activities to promote physical activity, maximise social connectivity, and teach life-skills (e.g., motivation, emotional regulation, and goal-setting) that are relevant and transferrable to other contexts (e.g., school, employment, independent living). The program was created through intervention mapping (IM), which involves a rigorous six-step process for intervention design (Bartholomew Eldredge et. al., 2016). Full details of the intervention mapping process are reported in chapter four. This method was chosen for its ability to aide in the development of a health-based intervention that relates specifically to the needs of the target population (e.g., Direito et al., 2018, Fassier et al., 2019). We developed a logic model of change via a needs assessment of the population (e.g., narrative review of the use of sport in FEP recovery; Brooke et al., 2018 [chapter 2]) and a qualitative investigation of barriers and enablers to sport participation for young participants with FEP (Brooke et al., 2019 [chapter 3]).

The early phases of IM confirmed that a feasibility and pilot study was the most appropriate study design because there is a need for sport-based programs in FEP recovery, but limited empirical evidence exists for such programs. A feasibility study approach informed the appropriateness of further intervention development and allowed us to assess components such as acceptability and suggested modifications (Bowen et al., 2009, Eldridge et al., 2016). We tested specific intervention components through the inclusion of a pilot study approach (Arrain et al., 2010, Eldridge et al., 2016). Randomisation was pragmatically unrealistic, and deemed unnecessary for the study goals at this early stage.

The program was offered weekly for two hours in the afternoon at a local sport facility central to the majority of the service's client base, as decided to be most

suitable time and location for both young and staff participants. The structure consisted of the following six phases: (1) welcome and ice breaker activities (e.g., get to know you games, team building activities), (2) warm-up (physical, e.g., guided movement; and mental, e.g., breath control), (3) skill learning (physical, e.g., ball passing; and mental, e.g., use of breath control within the sport), (4) play/competition (with rules of the game catered to abilities), (5) cool down (physical, e.g., stretching or walking; and mental, e.g., guided reflection), and (6) informal social time. A session plan outline can be found in the complete IM description (see chapter 4), and complete session plans for the six sessions are provided in the supplementary materials for this chapter.

Breaks were built into the session, and young participants were encouraged to take additional breaks when needed, and to watch from the sideline or engage in alternative activities (e.g., journaling, ring toss) if they preferred. The sessions were designed to foster a gradual progression of comfortability and skills including physical, mental, and social. For example, we supported physical skill progression by introducing skills in pairs or small group activities, and eventually move to a large group game. Similarly, mental skill progression included components like introducing goal-setting as it applies to step count for the session, and eventually progress to a discussion about goal-setting applicability to other aspects of life. Lastly, efforts to support gradual social comfortability and skill development included, for example, starting in pair-based warm up drills - pairs chosen by the participants - and eventually progress to whole group tag games with randomly assigned teams. The sessions were designed to be flexible and iterative, and were adjusted in the moment (e.g., due to skills, numbers, weather, or engagement), and week-by-week in response to feedback collected from young and staff participants and the observations/reflections of the facilitators. The program offered each sport for two weeks at a time to enable a progression of skills. The research team and service chose basketball for the first two weeks based on discussions with young participants at recruitment; the other sports (touch rugby and field hockey) were selected via a group vote every two weeks to promote autonomy and buy-in.

Young participants were not required to attend or participate in the sport sessions. They were also not required to engage in any data collection (e.g., questionnaires, interviews). Participants received an AUD 25 voucher for each session they attended as a reimbursement for time and travel expenses. Post

intervention, all participants were invited to participate in a semi-structured interview and complete post assessments. The post assessments were the same as the pre assessments (IPAQ, BPNSF, RAS-DS) with the addition of the Life Skills Scale for Sport (LSSS; Cronin & Allen, 2017), selected for its utility in assessing development of eight key life skills through sport (noting that we modified the instructional stem from “this sport has taught me to...” to “this program has taught me to...” to align with the nature of our study). Staff participants provided feedback post intervention via focus groups, separated into groups of community and peer support workers. Interview guides can be found in the supplementary material of the intervention mapping paper in Chapter 4 (file S4.3).

5.2.3.3. *Life skills.*

The primary focus of the sessions was on the sporting activities, with life skills development embedded in the activities by encouraging the young participants to apply the learned mental skills to other life contexts (e.g., breathing exercises learned in sport activity may be useful when feeling stressed in other contexts). This process was done through guided reflection in phase five of the sessions, and ongoing casual follow-up by the facilitators throughout following sessions. Based on our needs assessment (Brooke et al., 2019 [chapter 3]), we primarily targeted the life skills of motivation, confidence, and emotional regulation. Motivation was targeted through the self-determination theory framework, with the goal of enhancing the participants’ sense of competence (e.g., goal setting, skill progression), relatedness (e.g., team building activities), and autonomy (e.g., choice of sporting activities; Ryan & Deci, 2017). Bandura’s (2001) social cognitive theory informed our efforts to foster self-efficacy via mastery experiences (e.g., guided reflection on overcoming challenges), vicarious experiences (e.g., observing others with shared experience), verbal persuasion (e.g., support from facilitators and other participants), and physiological/affective states (e.g., reframing, normalising, or controlling physiological states). Emotional regulation was targeted using social cognitive theory (e.g., reframing/controlling of physiological states through breath work), and through Gross’ (2015) extended process model of emotional regulation (e.g., modifying emotion-relation actions through breath work, or changing one or more aspects of the external world by choosing to take a break or engage in an alternative activity), and was supported by biofeedback (i.e., pedometers/heart rate monitors). Healthy snacks, water, and electrolyte sachets were readily available during sessions to promote

safety and informal social interactions during breaks. In addition, communal food and drink were offered at the end during phase six to help further facilitate informal social interaction.

5.2.3.4. Facilitators.

Three facilitators ran every session. The facilitators were young adults (aged 28-36 years, two males and one female [me]) with experience in playing and coaching sport, sport program delivery/development, and/or sport/exercise science or pedagogy, as well as Masters level qualifications in sport and exercise psychology. We selected facilitators who are friendly and approachable, and able to build rapport with the young participants. All facilitators completed a mandatory 1-hour training session in psychosis psychoeducation, run by a member of the research team with >12 years research experience in early psychosis. The training session included information regarding what psychosis is, how it presents, what to expect, and how to support young people. Relevant early psychosis treatment manuals from Orygen, The National Centre of Excellence in Youth Mental Health, were utilised for this training (Crlenjak et al., 2015; Woodhead & Monson, 2013).

5.2.4. Outcomes.

The primary outcomes were feasibility of the program and assessment of intervention components. Feasibility was assessed through recruitment statistics, participant records (i.e., attendance, session engagement, and completion of questionnaire records for each participant), a record from the program facilitators (i.e., exact session activities, reflections/observations, and modifications made), and feedback from young and staff participants. Intervention components were assessed through session engagement, session records, and feedback from young and staff participants. Session engagement was recorded through recalled observations of young participants' active participation in the activities, interaction with others, and outward appearance of enjoyment (e.g., celebrating sport victories, laughing, teaching others). The facilitators wrote engagement notes post-session, as it was decided through feedback from the service that it would be more normalising for the facilitators to participate rather than take notes during the session. Feedback from young and staff participants was collected weekly (through phone calls, e-mail requests, meetings, and questionnaires) and post-intervention (through semi-structured interviews) to assess primary outcomes. The lead researcher (me) collected all feedback and conducted all interviews. Secondary outcomes included

life skills development, physical activity levels, social engagement levels, and psychosis recovery progress, although meaningful change in secondary outcomes was not expected due to duration and sample size. These outcomes were measured via the optional measurements pre- and post-intervention, and via semi-structured interviews post intervention.

5.2.5. Analysis.

Interviews were transcribed and input into NVivo data management software (version 11; QSR, 2010). Transcribed data were analysed using Braun, Clarke, and Weate's (2016) thematic analysis which involves a six-step iterative process: 1) familiarisation with data, 2) initial code generation, 3) generating initial themes, 4) theme review, 5) theme definition and naming, and 6) report production. Participant interviews were analysed separately by group; domains and themes were combined where appropriate. It is important to note that given the small sample size for the interviews, data saturation levels were not appropriate. The theme generation process was more deductive in nature as it sought to answer predetermined questions, however the reflexivity of thematic analysis enabled the researchers to also include inductive elements. In addition, the reflexivity and flexibility of this approach was especially important in constructing themes that captured the experience and feedback of different participant sets (i.e., young person, community worker, and peer support worker), and then connecting the interview data to the other study data. As such, after step five and before step six (report production), we compared the results of the thematic analysis with the other study data, namely, feedback collected weekly from participants, the observations of the facilitators, questionnaire results, and the intervention records (i.e., recruitment, attendance, engagement, modifications, and measurement participation records), to identify any relevant patterns or contrasting evidence.

5.2.6. Process evaluation.

We utilised Moore and colleagues' (2015) MRC guidance for process evaluation in addition to Bowen and colleagues' (2009) framework for feasibility studies to guide our process evaluation. We used the following components from the MRC guidelines to direct our evaluation: description of intervention and its causal assumptions, implementation, mechanisms of impact, and outcomes and context (see Moore et al., 2015). Using Bowen and colleagues' (2009) framework, we evaluated the following intervention facets: acceptability, demand, implementation, practicality,

adaptation, integration, expansion, and limited efficacy. Within both frameworks, for each component we assessed the following: the relevant questions, study findings, and questions for future work.

5.3. Results

A thematic analysis of the interviews resulted in the generation of the following domains: enablers, barriers, recovery benefits, skill development and transfer, and recommendations. Relevant themes and sub-themes constructed for each domain are summarised in Table 5.1. With the view to integrate interview results with other data sources, we present the findings as they relate to the following intervention phases (and related components): 1) research context and recruitment; 2) attendance and engagement (including session attendance and engagement, measurement/feedback attendance and engagement); 3) barriers and enablers to recruitment, attendance and engagement (including personal, environmental, and logistical; 4) recovery benefits and skill development/transfer; and 5) program modifications and recommendations. Each of the five sections will contain subheadings that refer to the domains and sub-domains generated from the interview results (see Table 5.1), and the corresponding themes will be illustrated with the participants' voices. Other relevant data from multiple sources will be presented in each section.

Table 5.1. *Domains and Themes Constructed from Thematic Analysis of Participant Interviews*

Domain	Sub-Domains	Themes
Enablers	Personal	<ul style="list-style-type: none"> Internalised motivation through alignment with goals (i.e. getting out of the house, social engagement, motivation, PA).
	Environmental	<ul style="list-style-type: none"> Safe Environment (i.e., supportive, non-judgemental, and normalised) made possible through: <ul style="list-style-type: none"> Structure (progression, breaks, normalising components) Facilitators (welcoming, engaging, normalising) Staff participants (rapport, peer support awareness, modelling, normalise/ balance power differential, safety)
	Logistical	<ul style="list-style-type: none"> Logistical components made attendance possible and alluring (i.e., transport

		support, provision of food/drinks, reimbursement)
Barriers	Personal	<ul style="list-style-type: none"> • Place in recovery journey not conducive to attendance <ul style="list-style-type: none"> ○ Relative approach is important in interpreting engagement
	Environmental	<ul style="list-style-type: none"> • Unappealing environmental conditions (i.e. large group, sport type)
	Logistical	<ul style="list-style-type: none"> • Logistical factors made engagement challenging (i.e. timing and length of program)
Recovery benefits	N/A	<ul style="list-style-type: none"> • Increased social interaction • Connection with others who share a common experience • Opportunity to challenge counter-productive beliefs • General mental health (i.e. enhanced mood, distraction from challenges) • Increased anxiety management • Increased confidence • Increased motivation for physical activity • Non-attendance benefits (i.e. self-assertion, motivation for other recovery outlets)
Skill Development and transfer	N/A	<ul style="list-style-type: none"> • Enhanced emotional regulation • Enhanced/application understanding of motivation • Use of skills outside of program
Recommendations		<ul style="list-style-type: none"> • Longer program • Youth friendly elements • Population sensitive equipment • Established service partner important

5.3.1. Research context and recruitment.

At the time of recruitment, the service partner had 17 active clients; 11 of which met the study's eligibility requirements, and seven of whom signed up. Of the six who were ineligible, two were too unwell to participate, and four were still undergoing assessment. Four eligible clients did not sign up because of clash with school, work, or family commitments, or because they disliked exercising. Service staff also provided feedback regarding aspects of the recruitment process (see Table 5.2).

Table 5.2. *Qualitative Responses from Community Workers (n=5) Regarding the Referring Clients to the Study*

Question	Support worker response (frequency)
When you talked to your clients about the study, what interested them the most?	<ul style="list-style-type: none"> • Reimbursement (3) • Social opportunities (2) • Opportunity to partake in a larger group setting (1) • The range of different sports (1) • Chance to participate in an activity to break the cycle of boredom (1)
When you talked to your clients about the study, what were their biggest concerns?	<ul style="list-style-type: none"> • Transport/location/getting there (3) • Socialising in a larger group (1) • Looking silly in front of other young people (1) • Confidence (1) • Being the biggest person there (weight) (1) • Timing of program (1)
What made you most interested in referring your clients to the study?	<ul style="list-style-type: none"> • Opportunities for socialisation/social skills development (5) • Opportunity for physical activity/exercise (3) • Opportunity to build confidence (1) • Mental health benefits of sport (1) • Importance of opportunities to get out of the house (1)
What were your biggest concerns in referring your clients to the study?	<ul style="list-style-type: none"> • Location/transport issues (1) • Motivation issues (1) • Anxiety (1) • That they would only attend once (1) • Regular Cannabis use (1)

We collected this information via questionnaire from all service staff who were the designated primary support for at least one young participant. Seven young participants enrolled in and provided consent to take part in the study (see Table 5.3 for demographic information).

Table 5.3. *Demographic Information of Young Participant*

Part #	Age	Accommodation	Marital status	Highest Education	Current work/ education	Current sport	Past sport
1	23	live with partner	gf/bf >3mo	year 11	none	no	yes- basketball
2	18	family home	single	year 12	none	no	yes- martial arts and swimming
3	18	family home	single	TAFE	none	no	yes- basketball, swimming, tennis
4	18	family home	single	year 11	none	no	yes- swimming, Ironman, Australian football, Rugby
5	19	family home	single	year 11	none	yes- basketball 2 hrs per week	yes- basketball
6	18	family home	single	year 12	University- part time	no	no
7	22	family home	single	not reported	part time; 20 hrs a week	yes- basketball; 8-10 hrs per week	yes-basketball

Note. Gender is not presented to for confidentiality reasons. 5 males and 2 females participate

5.3.2. Attendance and engagement.

5.3.2.1. Session attendance and engagement.

Of the seven young participants, five enrolled in the study before the sessions began, one enrolled after the first session, and one enrolled after the second session. In addition, nine staff from the service agreed to participate in a support role alongside the young participants, and to provide feedback during and after the intervention. They held varying roles at the service: community workers with primary clients (n=4), administration manager (n=1), peer support worker (n=3), and social work student (n=1). The average attendance rate for the young participants was 46.9%. A display of young person attendance and reasons for not attending can be found in Table 5.4. There were at least two community workers at every session, and at least two peer support workers at all sessions except one. Overall, engagement levels across all sessions were high for each activity, with the group warm-up and group game activities drawing the highest levels of perceived engagement. Some young participants and staff chose to sit out or engage in the alternative activities at various points (although this was not the norm). Overall, the facilitator reflection notes show increased levels of social interaction as the sessions and intervention progressed over the six weeks.

Table 5.4. Attendance Records of Young People and Reasons for Absences

Part #	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
1	Yes	Yes	Yes	No-reported feeling unwell and needed to sleep	Yes	No- reported feeling unwell and needed to sleep
2	Yes	Yes	No- driving lesson took priority	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	No- had medical procedure day before and was unable to attend
4	No - reported not feeling up to it	Yes- (big accomplishment to attend as reported by support worker)	No- anxiety and avoidance (as reported by support worker)	No- anxiety and avoidance (as reported by support worker)	No- waiting for a call (case manager suspects anxiety and avoidance)	No- no longer engaging with service
5	Yes	No- sore knee	Yes	No- family visit took priority	No- reported gym injury from previous day	No- family time took priority
6	n/a	No- university work took priority	Yes	No- university work took priority	No- university work took priority	No- unwell (hospital admission)
7	n/a	n/a	Yes	No- other sport training took priority	No- will no longer be part of the program as it clashes with work and training obligations	No- n/a

5.3.2.2. Measurement and feedback engagement.

Four of the seven young participants completed the questionnaires pre-intervention, of whom three completed the measurements post-intervention. These same three were the only young participants to engage in a post-intervention interview (others did not respond to invitations to be interviewed). These three young participants also had the highest attendance rates. Young participant feedback engagement during the intervention was low. Two young participants twice responded to feedback requests via phone, and one responded to a feedback request via e-mail once. All community and peer support worker participants participated in a post-intervention interview (one focus group for each). Staff participants provided feedback via phone interview and group meetings after the first session, via team meeting after the second session, and via questionnaire for sessions three-six. Collecting feedback through meetings led to feedback from more staff participants, as only 2-3 staff participants completed the feedback questionnaires each week. However, the staff participants provided more in-depth feedback via the questionnaires than via meetings or phone interviews.

5.3.3. Reported enablers and barriers to recruitment, attendance, and engagement.

In the interviews, young and staff participants reported personal, environmental, and logistical enablers and barriers to attendance and engagement. Feedback and observations collected throughout the intervention corroborated these findings.

5.3.3.1. Enablers.

5.3.3.1.1. Personal.

A discussion between the young person and service staff about the program's alignment with young person's recovery goals fostered recruitment, attendance, and/or engagement.

If it was in line with their goals and what they wanted to achieve, and that was getting out and being more active, socialising with people their own age, then it was easy to say "Oh, great we've got this great program, do you want to give it a go and see if you can meet some of them?" (community worker)

The young participants reported that this alignment with recovery goals is what motivated them to attend the program, and that this motivation was strengthened by pursuing these goals in a fun way. One young person put it this way:

Personally, I think it was getting me out of the house to do something physical, because I've struggled in that, with motivation in general. I was thinking I could be losing weight doing this, so it's a motivation for me. But it's also fun so you don't think about weight. I'm looking at my body saying am I losing weight excessively, so I think for me it was very important. I loved the sport component, just having fun. I loved seeing the people, I loved just talking with [the facilitators] and sport people.

Another young participant said:

I was motivated for a sense of belonging, participation as well. I enjoyed the sports in general, like rugby, and basketball, and getting involved, getting to know people, getting to make new friends, and learning more about people.

The peer workers provided insight on their own personal recovery journey when assessing the program:

I think that for a lot of young people experiencing psychosis, isolation is a huge thing. Your confidence sort of drops big time and you don't feel comfortable leaving the house or getting out of bed, and it's a really big push to get out there and make social connections again. It's really hard to get out of that comfort zone. Having something like (the intervention), where it's a safe environment, it's supported, you get to meet other young people who might have similar experiences to you, it's really empowering.

5.3.3.1.2. Environmental.

The participants reported that the environment of the program contributed greatly to their attendance and especially the engagement levels of the young participants. All participants reported that a strength of the program was that the environment was inviting. More specifically, participants reported that it felt safe, supportive, non-judgemental, and normalised; this perception was created through the structure, the facilitators, and the presence of staff.

5.3.3.1.2.1. Structural.

The structure of the sessions was important to foster engagement levels and ensure future attendance. Participants reported that the structure supported the young peoples' varying abilities, interests, recovery goals and fitness levels, which put them at ease. As one community worker described:

They are coming to a sport program they're like, Oh, what does that mean?

What does that look like? I'm not sure. "I think it was a welcoming program for the young participants who attended, and it wasn't too strict but it was fun, it was made kind of, accessible for everyone to participate in all the activities.

The peer workers echoed this perception of the settling nature of the structure:

I was a little bit anxious going into it, but I think you guys made it quite comfortable and I didn't ... the anxiety sort of went away quite quickly because I realized that you guys are kind of walking us through it. We weren't just expected to be awesome at it. Yeah, it was comfortable and it was guided.

I think it was something that anyone could do, and that's why I realised you don't have to be particularly good at this to take part in it. Anyone can do it, so. I think that's good factor.

A young participant similarly expressed how their anxieties were put to ease: *I enjoyed the team part of it. I felt like the first day I was really nervous, but when you actually got into playing it was just funny. So I think it was very carefree.*

Young participants also reported that the structure put them at ease as it was predictable, as captured in the following quote:

It was all planned and structured out, so we knew exactly what was going to happen in the program and how it was going to go about.

The progression of varying activities seemed to allow the participants to warm up slowly (physically and psychologically) to the sport of the day, and to the other participants. As one community worker described:

A main strength was having it broken up into different activities for the two-hour timeframe. I couldn't see most of us playing a sport for two hours and still being as engaged at the end as we were in the beginning. I think having those practical skills, especially if the young person hadn't played before, or even us, just to understand the game.

This notion was echoed by another community worker:

Yeah, understand the game, the rules, and just a different activity throughout so it wasn't the same thing the whole time. Having regular breaks as well, having that broken up. I also really liked the skills element. They're looking at

motivation and goal setting before and after. It has an intention, how it kind of supports you, or what can you get out of today that would be of most value to you. Getting them to make short term goals and focus on the positives of doing something like this.

The breaks, alternative activities, and food and drink provided enabled the participants to listen to their needs, and to engage in a way that served them. As one community worker said:

They were able to just go to the side and just take a minute and fill up their drink bottle and join back in in their own pace which I reckon was really good. Breaking it up made it more accessible for people who maybe weren't so good at the particular sport. But also just the ability for people to come back and see familiar faces, and have that chance at the end to sit around with some snacks and some drinks, and just socialize. I think that that was also really valuable component of it, maybe a bit of a driver for some people that weren't as sporty. They just wanted to be there to be in that atmosphere.

The young participants expressed the importance of the structure in making them feel safe.

It was important to do the introduction and the warm-up and everything like that. Just by letting everyone know who each other was, you feel safer knowing and stuff like that.

The participants expressed that certain elements of the structure helped to normalise the environment. For example, all participants expressed that they thought it was beneficial that the facilitators and staff participants participated alongside the young participants, and that no distinctions were made, or special treatment given:

Everyone was sort of treated the same, and it was all sort of equal. It created that sort of safe space environment where they're like wow, I can just be myself, I can enjoy this sport and it's not about me having experienced psychosis or having mental illness, this is just about me enjoying the sport and getting out and doing the things, and building that confidence (peer support worker).

In addition, the presentation of different session components helped to normalise the environment. Participants reported that the sessions seemed to meet the needs of the young participants, without feeling too mental health specific. For example, as one peer worker described:

I remember one thing is when we were doing the breathing activity, you didn't make it psychosis specific, and you made sure to mention that, "oh, we do this because athletes use it as well". That sort of normalised the experience.

One young participant also expressed how normalised the sessions felt:

It didn't become about kids in recovery for me. I thought it was just a bunch of adults at sport. To be honest it's just a chilled recreational community sport thing. I didn't even think of people's mental health issues. It was more about we're all there to have fun.

Similar to the feedback from the participants regarding the program structure, facilitator reflections also noted that the progression of the activities (i.e. graded social interaction and activity levels, and social ice breaker and non sport-specific games) seemed to help foster engagement levels.

5.3.3.1.2.2. *Facilitators.*

The participants reported that the facilitators played a critical role in creating an environment that was inviting (i.e., safe, supportive, non-judgemental, and normalised). Participants reported that the facilitators were approachable, easy-going, and nonjudgmental, which in turn put the participants at ease and fostered engagements. The community workers reflected that the facilitators made the young participants feel comfortable and supported:

The facilitators were welcoming and really friendly, I really liked how they greeted each young person by their name, they remembered their names week after week. They asked how everything was going. They made an effort to talk to the young participants.

Even if a young person was sitting on the side, one of the facilitators would sit out, and actually have a conversation with that young person. One I'm thinking about in particular, that young person really valued that experience more so than anything else from the program that this male took time to speak with him in a positive way.

The young participants' reflections supported this notion:

*The facilitators were great. To be honest I was nervous they would be judgemental about people in general who are maybe overweight and stuff. When I saw them, I was like, "sh*t they're sporty". But when we met, they literally put me at ease, and were joking with me pretty much every session.*

Yeah, and it got real chilled because I think you just talk about TV shows and general stuff and then you all become friends.

Lastly, participants noted that the facilitators played an important role in normalising the environment:

I noticed that the facilitators talked to some of the staff and were just like ... "oh, how're you going, what happened on the weekend?" But then you also do the same for the young people. Like, you just turn around and do the same for the young people. I think that would have been a very... don't know the word for it ... just normalising the entire experience in that it's not like all the conversation is towards the staff and we're talking about you behind your back, because I know that ... for some people who experience psychosis, paranoia is very prominent and that there may be that fear of even like lingering paranoia that'd be like, are people talking behind my back? What's happening here? But I think because everyone was so open and welcoming of everyone that came in, it was quite lovely (peer support worker).

5.3.3.1.2.3. Staff participants.

Young participants and staff participants reported that the inclusion of the staff participants helped foster an inviting (i.e., safe, supportive, non-judgemental, and normalised) environment. The staff participants were originally included in the design to provide logistical support (e.g., transport), promote psychological safety, and to provide feedback. However, the reflections of the young participants, staff participants, and the facilitators showed that the inclusion of staff participants had unexpected benefits. The staff participants reflected that participating alongside their clients strengthened their rapport and relationship with the young participants:

Yeah, I think just normalising that this is a learning experience for most of us, in terms of some of the sports, definitely helped in building a rapport I think. But also allowed us to reflect back to the young person, "Oh, you did this really well, you seemed happy when you did this activity," or, "Tell me what that was like for you, because for me it was like this. I want to check in if that was all right for you." It actually allowed a conversation around experience and potentially implementing some of the things we've been trying to work on anyway. That shared experience, that that would have been present in that conversation. I think it's more value than I was just watching them on the

sidelines and being like, You didn't even participate, how would you know?' If they were challenged by something especially you could have a conversation around that and it was heard because you did the same thing (community worker).

Interestingly, this rapport extended beyond the immediate worker-client relationships, and into the service as a whole:

I think it helped build our therapeutic relationships, not just with the people we're working directly with, but with the wider young participants, and as our service goes more into making groups and stuff I think it builds better relationships across the service for all of us. Young people that we saw individually, young participants that maybe we'd only heard about in team meetings, we could all interact together, and support each other, and so it brought all of us together. I thought that was really nice (community worker).

Yeah, like as a team I felt that we really sort of came together and like it was really good. Just building as a team sort of thing. Even during meetings and stuff, working out who is going to pick up who from where and doing that sort of thing. It brought us all together. As a team, we all came together to be part of this study, I think it was awesome (peer worker).

The peer support workers also reported that participating alongside the young participants helped them build rapport with current or potential clients, and to build awareness amongst the young participants of what peer support work is:

Peers sort of like walk alongside people, and (the intervention) normalized that like yes, we're workers, but we're also part of this program too, and we're doing this together sort of thing. There isn't a lot of awareness out there that we're actually people who are just like you, we're just a bit further along on our recovery journey, and we're able to give some support back. (The intervention) definitely gave us an opportunity to have those conversations.

The participants expressed that the inclusion of the staff participants helped to normalise the activities and model engagement for the young participants. The staff participants, in particular, emphasised the importance of this normalisation:

Good that the young participants could see that we were participating too, it wasn't just a program for them it was a program for everyone and we were also participants doing the exact same thing, and exactly the activities that

they were encouraged to do. All equal, it painted us as all equals and that we were ... I for one, aren't as good at sport, so I think it helped as well making the young participants feel less anxious about the experience (community worker).

I think it was a great way to role model that, even as adults we're still challenged by different experiences, and that we're willing to give things a go, and if we're uncomfortable and that we're not all great at everything (community worker).

The staff participants also noted how participating alongside the young participants helped level the power differential between them. Most of the young participants had more sporting experience than the staff participants, and as such the sessions provided opportunities for the young participants to take on a helping or leadership role. The staff participants expressed the value in the opportunity for the young participants to help others:

For a lot of young people who experience sort of psychosis and this thing, we sort of become very vulnerable and like suddenly family members, friends, like support services, they all swoop in and sort of like they're helping you, and you're always getting helped sort of thing. I think it's just great to sort of give people an opportunity to be like, well, you might actually be helping other people (peer support worker).

One of the young people I brought along used to play basketball so she was giving me tips on how to shoot and helping me with basketball in general which was really cool. That sort of thing, I think it just shows them that they have more value than they think they do, and that they have important things in their life that they can offer to other people (community worker).

For the young participants, interacting with the service staff in a new way was a welcomed change:

So I think in a sense it was great having them in a fun, social scene rather than seeing them to talk about all your problems.

The young participants also focused on the feeling of safety that the inclusion of staff brought to the intervention:

There's a sense of responsibility and trust. There's a sense of trust, like in the

support networks that we had there.

It made me more at ease. Because if you put a whole bunch of (young people with psychosis) together, you don't know what the heck's gonna happen and (the staff) can deal with it. Even though nothing really happened it was good to have that there.

The facilitators' reflection notes stressed the importance of the staff participants in modelling and normalising engagement, especially in the early sessions. The facilitators observed that having a consistent base of people willing to try an activity regardless of their skill or comfort seemed critical in maximising the buy-in of the young participants. They also noted that it was helpful to have a consistent group of people to balance numbers on days when young participant numbers were low. Lastly, the facilitators were pleased to observe the growth in the rapport between the young participants and staff as the session progressed.

5.3.3.1.3. Logistical.

The participants also reported that the logistical provisions (i.e., transport, refreshments, and participant reimbursement) of the intervention allowed for attendance and engagement. First, transport was critical for attendance. All young participants were transported to all sessions by the staff participants, and staff reached out to the young participants weekly to confirm their attendance and to plan pick up. All participants confirmed that without this support, the young participants would have most likely not attended. Proximity of the young participant's home to the intervention location did not alter this response. In addition, the participants reported that the refreshments provided during and after the session encouraged attendance and engagement. Not only did the food promote social interaction and help the young participants feel supported, but it also made it physiologically possible for the young participants to participate, as they felt that the food and hydration helped support them through the demands of physical activity.

Sometimes I wouldn't have eaten that day, so when I went and there's heaps of fruit and sandwiches and stuff afterwards, it was really nice (young person).

And you guys were always checking how we were and you took care of us.

You fed us which was very important, that's one thing that was very important. But I think that also made us feel cared for because you lose a lot

of sweat and you guys really looked after us. It gave us time to bond after. It was really yummy and healthy food (young person).

Lastly, the participants reported that the reimbursement provided to young participants at each session served as an incentive to sign up and to attend. However, although the vouchers seemed to support recruitment (see Table 5.2), the motivation to receive the vouchers was discussed much less than other motivational factors (e.g., opportunity to work toward recovery goals), especially as the sessions went on.

5.3.3.2. Barriers.

Barriers are those factors reported by the participants and/or observed by the facilitators that inhibited young participants from signing up, attending and/or engaging in the intervention sessions.

5.3.3.2.1. Personal.

The reported personal barriers to all phases of the intervention related largely to the young peoples' recovery journey. Some young people were too unwell to be ready to engage at the recruitment phase. Lingering symptoms and ongoing poor mental health prevented young people from attending (see Table 5.4). We reported in the enablers section that the intervention's alignment with recovery goals supported engagement throughout the program. Conversely, the service staff reported that, for some young people in their care, if intervention didn't align with their recovery goals or was not well suited to their current recovery level, engagement suffered as a result.

For some of them I know the point of recovery, they changed their medications, you know when you change medications typically a lot more tranquilizing for the first few weeks. I know that was the case for some of the young participants, and also like were saying before being isolated and then going into that setting for some of them it felt like the right time to do that, and for some of them it was maybe a bit intense (community worker).

I think it's about sort of where they're at in their recovery journey. There's a window, where it's like really useful for where they're at, but some people might be at a point where they're at really low motivation, and they just don't want anything to do with it. You might get people on the opposite side of the spectrum who are actually doing really well and have been in recovery for a while. They've met some of their goals, and they're actually working on some of their own personal goals in their own time, and that's like the reason why

they're not coming to the group, because they're actually working on things that they want to do with their social networks and physical health networks, stuff like that. It's trying to find the best fit (peer worker).

The staff participants also emphasised the importance of taking a relative approach when looking at attendance and engagement overall.

I think for some as well that it's their experiences from the past and how they see the world definitely impacted engagement. Maybe there's no control in their life and their level of commitment generally is quite low. The level of commitment maybe is not their own drive, but other people's. So they've tried it once and they're satisfied with that. That is a huge achievement going once for some young participants (community worker).

5.3.3.2.2. Environmental.

Although some people reported that the group environment and mix in sport options were strengths in the intervention, staff participants reported that these elements also served as barriers for some young participants. The large group environment was reportedly overwhelming to some and may have limited attendance and engagement. In addition, if the sport of the day was not the young person's sport of choice, they were less likely to attend.

I found that a few of the young participants mentioned that they liked that it was a different sport each week, and that sort of kept it fresh. I did also notice that there were quite a few young participants who didn't like certain sports, and that was a reason for them not coming, so it was a strength but also a weakness (peer worker).

5.3.3.2.3. Logistical.

Certain logistical components served as barriers across all phases of the intervention. The timing of the intervention served as a barrier in the recruitment phase, as at this time the client numbers were low and the service was still assessing some of their new clients. Transport was a common concern of young participants during the recruitment phase, but this was alleviated through the service providing transport. However, the community workers reported that the timing of the intervention made it difficult to support the young participants in arranging their own transport.

I think a longer program would be beneficial. Especially in a way that we can have more opportunity to promote independence within the young participants, in terms of doing off their own back and taking some real onus of the situation in the groups, I think a longer group would have given you more of an ability to start working on those. For example, doing transport training with them and getting them onto public transport, doing that with them, supported. And then them doing it themselves. Because I know a lot of them wouldn't have attended if we didn't drive them or pick them up.

In addition, some of the young participants were at a point in their recovery where they had returned to university, work, or other commitments, which served as a logistical barrier to recruitment and attendance (see Table 5.3).

5.3.4. Recovery benefits and skill development and transfer.

The study was a pilot and feasibility study, and as such the primary outcomes were assessing the feasibility and acceptability of using sport for a population with FEP, and to test out intervention components. Given the six-week time frame of the intervention, outcomes relating to recovery benefits and skill development and transfer were not expected. However, the results collected are worth reporting to inform the development of future studies/clinical work.

5.3.4.1. Recovery benefits.

The participants reported some recovery benefits for the young people as a result of their engagement in the study. First, the participants discussed the benefits of social interaction in general.

In the car in the beginning, they all kind of sat in silence, Hi my name is ..., nice to meet you."Then in the car on the way back, some days where I'd have three young participants in the car, I noticed how comfortable they were and casual with their conversations and joking in the car and stuff between each other and telling each other stories of what their home life was like and stuff. And then it progressed as the weeks went on. I think it was about week three maybe or week four, I had three young participants in the car back to their houses and they were constantly joking amongst themselves, talking about films that they'd watched, and explaining films that each other hadn't seen (community worker).

It helps in general social situations. It's funny to say I went to a sports situation and I gained social skills. But you do because you interact with many different people. My job actually I do, but my job I'm in a formal setting. This is different, this is social, every day for me so I think it was really important (young person).

The social component was very powerful, because that could be the start of their journey back to socializing, essentially. For me, it was a couple of different things, but like this might be the beginning of someone's journey back to socializing, because that might help build their confidence, that little bit, and to help them move forward even further (peer worker).

More specifically, the participants also reported positive benefits from the opportunity to connect with others who share a common experience.

Yeah, I think it just made them reflect on maybe how isolated and kind of caught up they had been with their own experiences, but actually there's other young participants going through this and it's great to normalize that experience but also talk with people your own age (community worker).

It was fun getting to know everyone and the journey they've been through, similar to mine, some of the experiences they've gone through. I've had some experiences as well so we can sort of relate as well (young person)

The young participants reported that connecting to others going through a similar experience gave them a sense of belonging and an additional support network.

You felt a sense of belonging and you weren't left out or anything, so it's a sense of inclusion. You're getting to know people that have had similar experiences and that sort of thing. You know that there's help out there if you need it as well (young person).

The participants also reported that being a part of the study gave the young people an opportunity to challenge debilitating or counter-productive beliefs.

I think it was a chance to challenge some of their anxious thinking and what they expect will happen. Having actually an experience where you can challenge them on and say, Well, actually this didn't happen here," or how you were thinking about that beforehand didn't actually eventuate. If you think of

some of your other kind of thoughts are potentially wrong. Just allow a conversation after that experience to happen (community worker).

I think it's because when I went to the sport thing I was like I'm gonna be so nervous"but I wasn't, so I'm like, I'm overthinking. I realize it's not as big of a deal (young person).

For some, these beliefs related to negative experiences about sport, or what type of people participate in sport.

It kind of debunked some of their own beliefs that they held around sports are hard, quite demanding physically. It's just going to be horrible, I'm not going to enjoy it (community worker).

Yeah. I think to some people sport is amazing, but for some people it's also been a pretty horrible experience in the past. So it's nice for people to have a positive sport experience (peer worker).

Some of the participants reflected that participating in the study helped support their general mental health and manage or distract from some of their symptoms or challenges. One young participant described a shift in their mood:

So I think I was going through other triggers and mood swings so I was worried this was gonna show 'cause they can be extreme, but it wasn't and I found that being in a controlled environment actually helped me. I made a difference and that was what I really liked about it, I was happy for one. During that time, you know when you get up and you feel happy about things? I actually started feeling happy about something, going to something.

Another young participant valued the distraction the program offered from challenges:

It distracted me. Like, so if I were having a bad day, it would give me a reason to get out of the house and it would distract me from what was bothering me, or whatever.

The participants expressed that participation helped lessen anxiety in that it created a positive experience in a situation in which young people with FEP generally felt anxious. One young participant expressed how this anxiety management extended to other areas of their life:

Having this (program) then helped me do other things like go out and go to the shops by myself and do stuff by myself a lot more. Even though I was doing that all before, it made me not scared to do it, if that makes sense. Not as anxious.

Similarly, the staff participants emphasised the impact the study had on the young participants' confidence.

A lot of people who have experienced psychosis, afterwards they've dropped out of education and all their friends are off doing these other things and that leaves them being quite isolated, and the longer they stay isolated the less confidence and lower their self-esteem becomes. I think being able to have those leadership roles and be in a group where things are a level playing field helps build that up again to being back into maybe the biggest group they've been in for the past year for some of them. Realise actually it's okay, it's not a big scary thing, everyone was friendly, I participated in a group, 12, 15 people, had a good time, and maybe none of their concerns or anxieties around what that would actually be like, came through. I think that reinforces them in other parts of their life to be like, Actually why am I putting these things off? I can go out there and join in this group or start to follow this hobby instead of just being at home" (community worker).

In addition, the participants all expressed that the study helped support the young participants' motivation for physical activity

I think certainly for the young participants it really helped with their motivation. Our clients are quite young, clients are 17 to 24ish, so maybe they don't have the insight that you get as you get a bit older about physical activity. I think sport is just a really good way to bring it and make it fun.

Lastly, the community workers reported that there may have even been benefits for those who were enrolled but chose not attend, in that it gave the young participants an opportunity to assert themselves, or engage in other activities that best served their current needs.

I think even the ones that started to say that they weren't coming in the weeks I think it gave them an opportunity to put in their own boundaries around what they want in their life. "Actually I don't want to turn up this week and I've made that choice, I'm not going to do it just because I might offend (my support worker)".

Another community worker said:

I think as a positive it made (a young person) realise that “actually I do want to get out, actually I do want to do a bit more activity”. One of the main reasons they stopped attending is because they joined a gym, start attending that three times a week and saw that as a priority over the study. That had been something we had tried to work on before they had done the study, and I feel that maybe the study was a kick start for them.

Measurements. Young participants were invited to complete self-reports of psychosocial factors pre- and post-intervention. These measurements were offered with the aim to assess willingness to complete, as significant changes could not be expected in the time frame or with the sample size. However, for the three young people who completed all measurements (who were also the three with the highest attendance rates), the measurements show a favourable trend. Visual depictions of raw scores for each participant are provided in Figures S1-4.

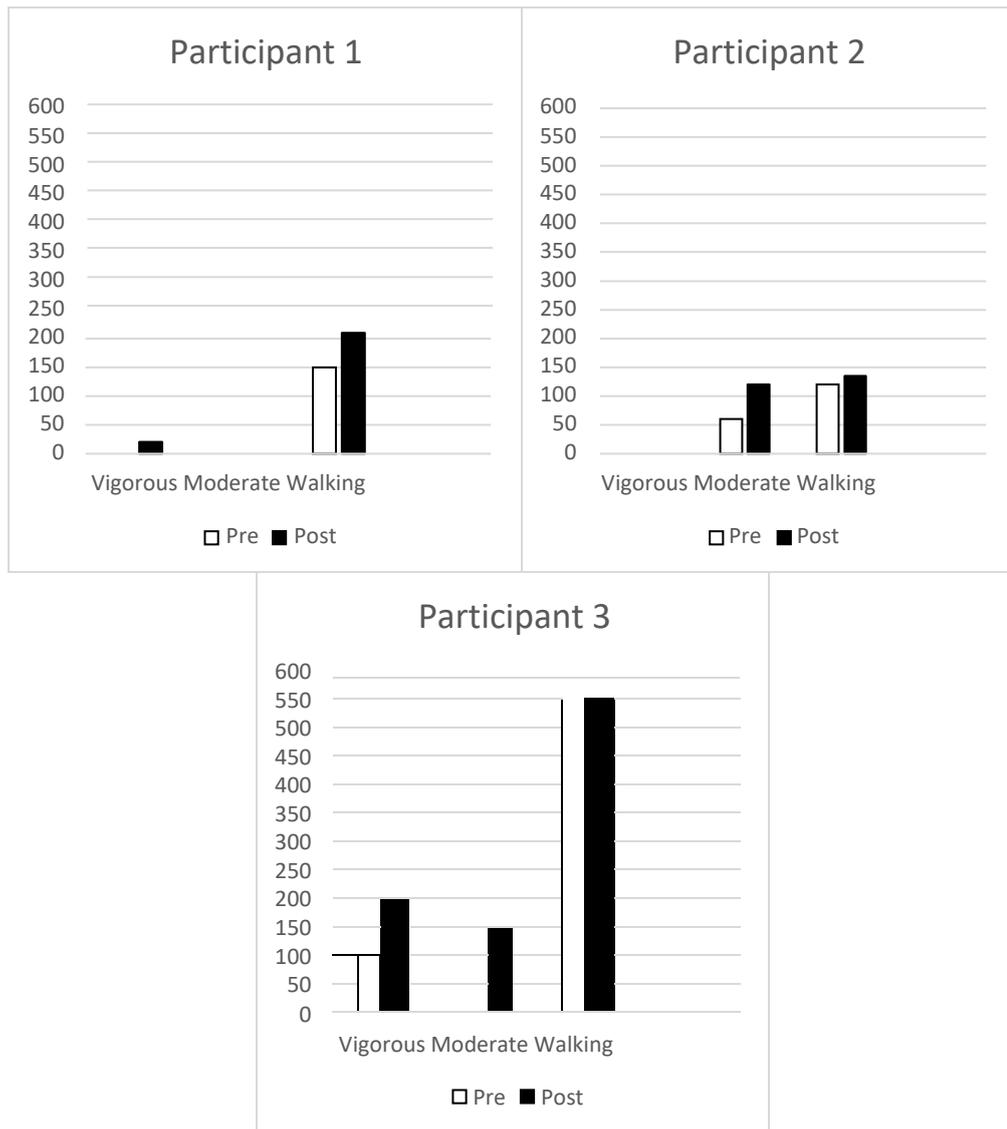


Figure 5.1. Pre and post results for the International Physical Activity Questionnaire (IPAQ) for 3 young participants. Display is in minutes of various types of physical activity in the past week (not an intervention week).

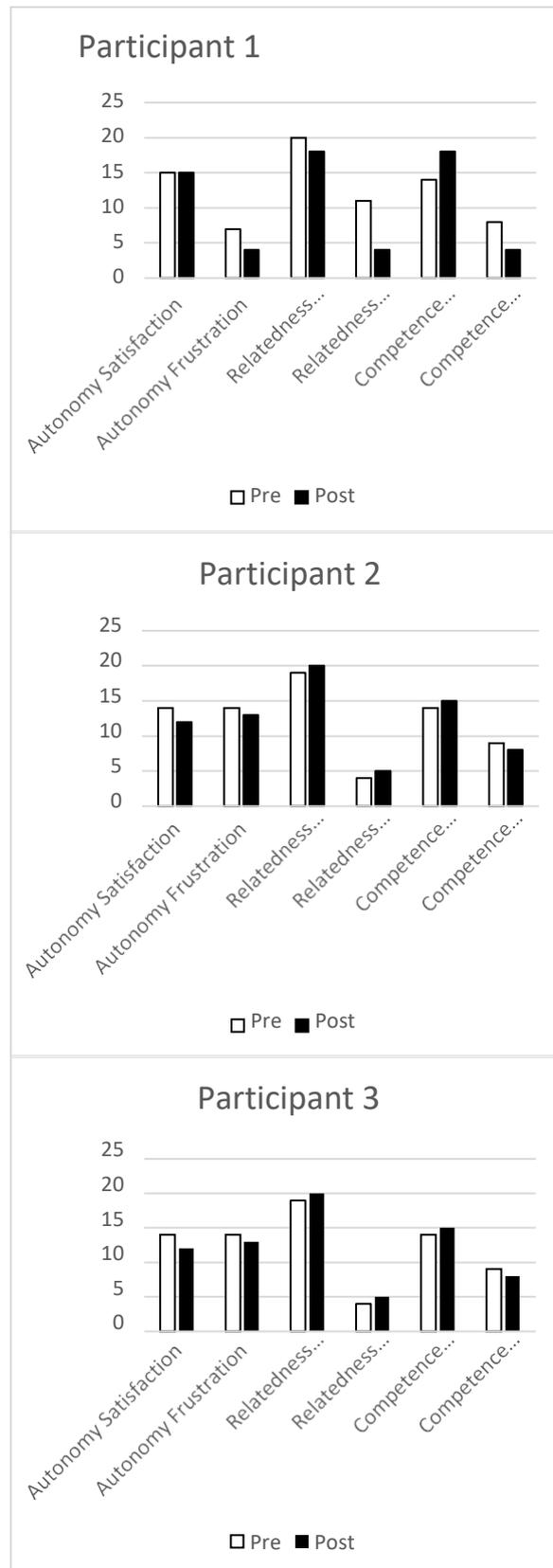


Figure 5.2. Pre and post results for the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS) for 3 young participants.

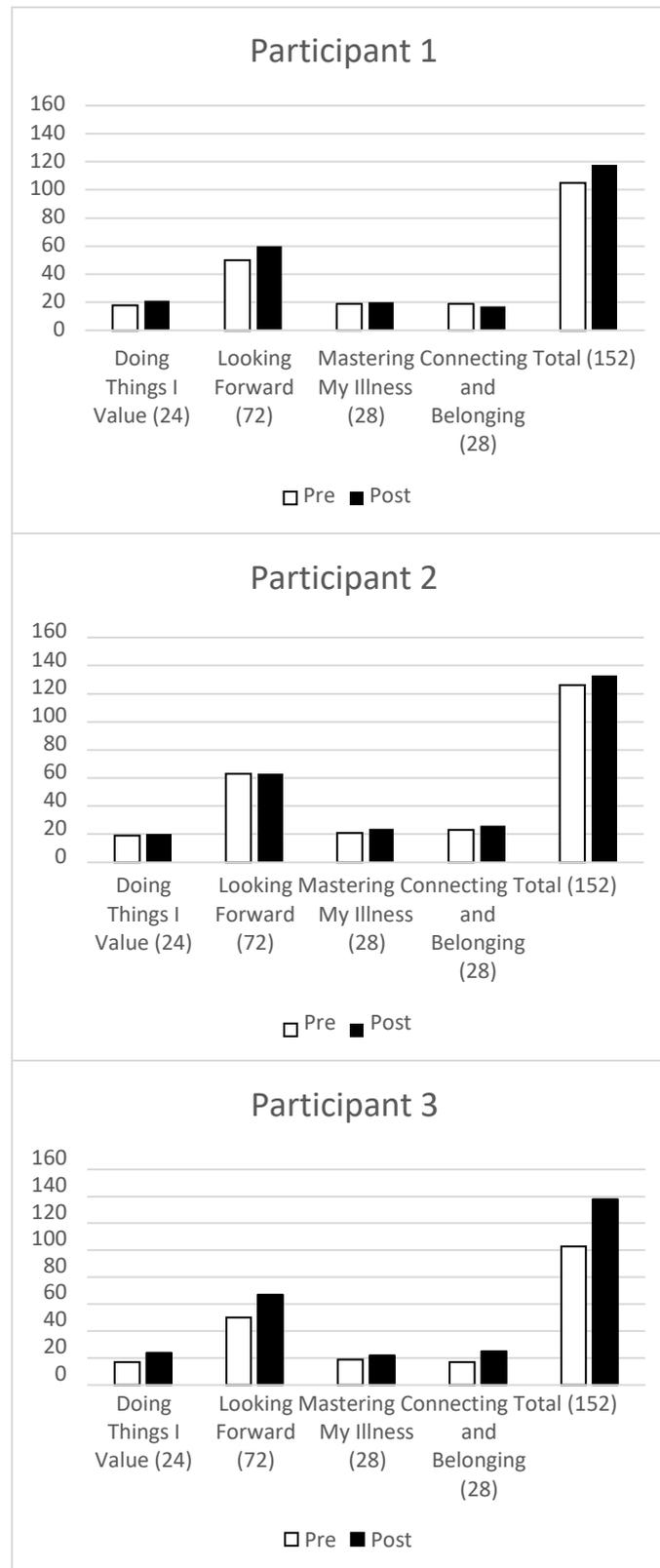


Figure 5.3. Pre and post results for the Recovery Assessment Scale- Domains and Stages (RAS-DS) for 3 young participants. The maximum possible value is in parentheses.

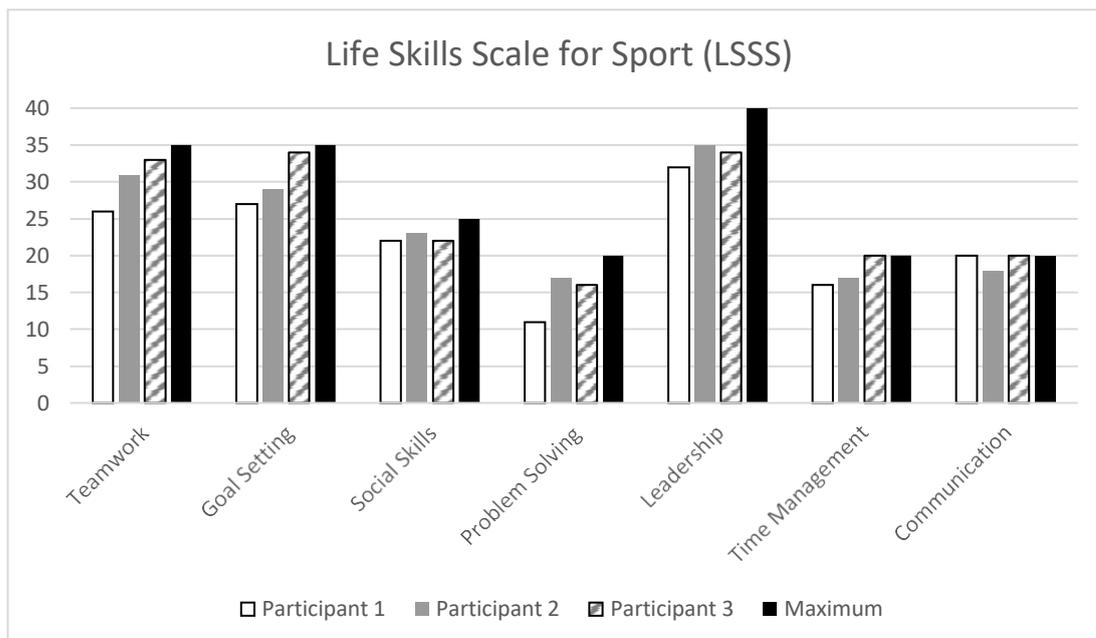


Figure 5.4. Results for the Life Skills Scale for Sport (LSSS) for 3 young participants (delivered post intervention only).

5.3.4.2. Skill development.

Components of the study included physical and life skills training. Again, it was not expected that the participants would demonstrate significant measurable skill development within the limited timeframe of the pilot and feasibility platform. However, some reflections from participants regarding skill development are worth considering for future work. In regard to physical skills development (e.g., sport skills, fitness), the participants did not report a change in their physical skills beyond the previously discussed shift in perceptions of sport/physical activity, and the accompanying shifts in confidence, motivation and anxiety. However, the participants did express a shift in some of the targeted life skills.

One participant reported:

I think I've learnt physical skills in how to breathe properly during sport. Because I think I never took that into account. Breathing properly is so important for heavier than normal people. There were times in my head during the program where I would just step back, look at a situation and breathe, reiterate that "do I really have to be upset about this, do I really have to get anxious about it, do I have to overthink it. You're okay."

This same participant also connected with the goal setting:

For me goal setting was really important even though I just wanted to play sport. But even my (action) goals were, “take a break if you need to”. They were simple tasks because I have an issue with wanting to look good and not take breaks and look lazy, so I was like no take a break if you feel sick or tired, which I did in the next session.

Another participant enjoyed:

Learning about motivation and the different types of motivation, the good types, the bad types. I found the breathing as well, the breathing helps. It's really calming, the techniques that you've thought of.

5.3.4.3. Skill transfer.

A critical component of life skills training is the successful transfer of the skill to another context. One young person said:

I just think the strategies I learnt there without even knowing and then reflecting on my change, I've managed to put to other situations and how to calm myself and the breathing when I'm anxious. Like for example, with driving, I think I need to put aside that anxiousness and the fear of failure because I need my license. But if I had trouble I was asking Mum in a more calmer tone and not freaking out 'cause I now know not to freak out when you're anxious.

Speaking about a different young person, one community worker reflected:

(Young person) said that what they got from it was it helped support their motivation to do other things outside of the study, so they started volunteering twice a week, which wasn't happening before so that's a really good outcome for them. They've also found benefits in looking at their motivation, like the extrinsic and intrinsic motivation. They found that, I think quite helpful.

5.3.5. Program modifications and recommendations

Following the principles of a feasibility/pilot study, feedback was collected during and after the intervention with the view to strengthen future iterations of such a program. Full details of this feedback are provided in Table S5.1 in the supplementary material. General feedback for future programs was overwhelmingly positive in regard to the design and implementation of the current study.

Nevertheless, the participants provided some valuable constructive feedback that may be informative for future work. First, it was suggested by all that a longer program would enable more opportunity for skill development, recovery benefits,

physical health benefits, and more independence (e.g., transport) for the young participants. Second, participants emphasised the importance of more youth-friendly elements in the program methodology, such as tablets with emoji-based Likert scales for some of the measurements, and colourful and customisable workbooks (vs. the plain black workbooks used in the study). Third, the participants recommended enhanced sensitivity to the population's need in regard to equipment, specifically in regard to larger bib sizes and wrist-based heart rate monitors (vs. under the shirt chest monitors). Finally, the involvement and support from the service was critical to the successful running of the study from logistical (e.g., transport), implementation (e.g., service staff participating alongside young participants), and evaluative (e.g., providing feedback during and after) perspectives. However, a service with an established client base may have enhanced recruitment and retention, in turn enabling a more favourable support worker to young person ratio. However, a more established service may also have more competing demands.

5.3.6. Process evaluation

A detailed display of the process evaluation is provided in Tables S 5.2 and S 5.3 in the supplementary material. Overall, the study produced results indicating feasibility of a sport-based life skills program to promote functional recovery in young people with FEP, and also highlighted some challenges to recruitment and retention. Moreover, the process evaluation highlights specific successful design components, and suggested areas of future research.

5.4. Discussion

In this study, we documented the systematic delivery and evaluation of a sport-based life skills program designed specifically to meet the needs of young people recovering from FEP. The aims of the study were to assess the feasibility of this type of program for the population, test intervention components, evaluate if future work in this area is warranted, and provide recommendation for such work if so.

The results indicated a high degree of acceptability for sport-based recovery work within FEP, suggest that this work may be a feasible and beneficial recovery outlet for the population, and provide valuable insight into critical intervention components. Overall, young and staff participants' feedback indicated that the program was engaging, enjoyable, and beneficial. The feedback, coupled with recruitment and attendance records, indicated that the program may be feasible on a

larger scale, but that further piloting is warranted to address specific challenges (e.g., recruitment and retention) and uncertainties (e.g., working with a more established service, adapting to other locations/cultures). Feedback from young and staff participants, in addition to reflections from the facilitators, gave valuable insight into specific useful intervention components, suggesting that the structure (e.g., graded participation), amenities (e.g., snacks, breaks), and personnel (e.g., friendly and engaging facilitators, staff participating at the same level) were critical to the success of the program. Although the results do not provide enough evidence for a full trial, these results urge further piloting in this area (see Tables S2 and S3 for a comprehensive list of suggested future research questions developed in the process evaluation).

This study is novel several ways. First, to our knowledge, it is the first to utilise intervention mapping within FEP research. The participants' feedback indicated that the study was successful in meeting and adjusting to the specific needs of the population, for which we credit the use of intervention mapping. Considering the success of this systematic intervention development process in targeting various health outcomes (e.g., Garba & Gadanya, 2017; Lamort-Bouché et al., 2018), and the specific needs for young people with FEP, those working in early intervention in psychosis may want to consider employing intervention mapping. Second, this is the first intervention study that we are aware of to apply sport-based life skills development within FEP functional recovery efforts. To date, researchers have focused predominately on the benefits of exercise (e.g., strength training) for FEP recovery. However, the additional benefits of sport (e.g., life skills development), demonstrated to be useful in other vulnerable populations (see Hermens et al., 2017), have yet to be explored for people with FEP. In addition, this study is novel in that it specifically targets physical activity, social connectivity, and life skills development in one integrated intervention. The integration of multiple recovery outcomes in one study may be a valuable option for FEP functional recovery efforts, considering the challenge of engaging young people with FEP (e.g., Brown et al., 2019; Woodhead & Monson, 2013). In other words, targeting multiple recovery outcomes within one intervention (e.g., the current study; Curtis et al, 2016) may maximise the limited time that young people do engage. Lastly, this study is innovative in its use of mental health support staff (e.g., community workers and peer support workers) as participants alongside the young people with FEP. Previously researchers have found

running an intervention directly through a FEP service to be useful for recruitment and retention (e.g., Curtis et al., 2016), but to our knowledge, this is the first to engage service staff as study participants who engage on the same level as the young people with FEP, and assist them to engage in the program. The rapport building, normalising effects, modelling, and feedback opportunities reported in this study as a result of the inclusion of service staff warrant future. Of particular interest is the inclusion of peer support workers with a lived experience of psychosis, who provided a unique and valuable perspective. The program feedback they provided during and after the study, as well as their unique ability to connect with the young participants given their shared experiences was a valuable asset of the study. We hope that this feasibility and pilot study is a starting point for these novel intervention components, and that future research explores these concepts further.

This study is not without limitations. The low participant numbers, short intervention duration, inability to collect more objective outcome data, and lack of randomisation yielded inconclusive information regarding the secondary outcomes (i.e. functional recovery benefits). In addition, the feedback from the staff participants indicated working with a new service may have negatively impacted recruitment and retention (e.g., no established relationships between young people and service); piloting with a more established service would be useful. Lastly, this study was conducted in Perth, Western Australia and inferences to other regions or cultures should be done cautiously. We do not feel that these limitations should deter future work in this area, as this study was merely a starting point for sport-based life skills functional recovery efforts in FEP.

In conclusion, the results of this study suggest that sport-based life skills programming may be feasible and useful within FEP functional recovery efforts. We found that, despite the challenges of engaging this population, further work in this area is warranted; we implore researchers and clinicians to consider building upon the current study.

5.5. Supplementary Materials

Table S5.1. *Session Feedback, Reflections and Modifications*

Session # and notes	Facilitator Reflection	Young Person Feedback	Support Worker Feedback	Modifications
<ul style="list-style-type: none"> • Session 1 • Indoor basketball • 4/5 young people attended • 7 support workers attended (2 peer support workers) 	<p>What went well:</p> <ul style="list-style-type: none"> • Initial rapport building went well; it was helpful to engage with young people as they came in and during the breaks. • Engagement and buy in was high- everyone participated the whole time. Young people appeared more comfortable as the sessions progressed • The progression appeared to work well to help participants feel comfortable and build some rapport and group cohesions. It seemed helpful to allow the young people to work 	<p>What went well:</p> <p><u>Phone interview with young person:</u></p> <ul style="list-style-type: none"> • Favourite part of session was the warmup; helped the young person learn to socialise and get more comfortable with others • Enjoyed the food and the electrolytes- wasn't expecting that • Was proud to have overcome challenges of socialising and engaging in PA for the whole session 	<p>What went well:</p> <p><u>Community worker phone interview (primary support worker of 2 participants):</u></p> <ul style="list-style-type: none"> • Observed levels of engagement, enjoyment, openness, and confidence in clients not seen before • Enjoyed seeing clients helping other young people with shooting skills • Enjoyed seeing young people helping support workers with skills and with rules knowledge • Expressed that young people demonstrating helping behaviours could be empowering for them and helpful for recovery • Thought it was helpful that the young people and support workers were all treated the same and were asked to just introduce themselves with their name and favourite sport (rather than their role at service); was useful to level the power dynamic • Enjoyed the flow and the gradual progression of activities • Expressed that the activities made it enjoyable for all skill levels; non-conventional sporting activities (e.g., tag) useful to build confidence and foster engagement for those with lower sport skill levels • Enjoyed the confidence metre to help participants relate to one another • Pedometers were well received <p><u>Community worker phone interview (primary support worker of 1 participant):</u></p> <ul style="list-style-type: none"> • Expressed that the icebreaker was useful to make people feel comfortable 	<ul style="list-style-type: none"> • Keep structure but progress to group game sooner if ready • Continue to participate as facilitators, rather than take observational notes during sessions • Encourage helping behaviours amongst participants • Provide rationale for activity components, especially if not overtly related to the sport of the day • Provide more education around pedometers (and HR monitors when introduced) • Continue to create challenges and constraints for activities to encourage graded participation; be sure to divide skills players amongst teams and provide constraints if necessary (e.g., can only have the ball for 3 seconds; must stay in one zone, etc) • Allow more time for group game and for informal social time at end • Have informal social time at the end outside or in a dedicated room at the sport centre (depending on weather) • Engage participants in some standing stretching activities during warm-up to avoid standing • Keep “housekeeping” component brief • Label food with ingredients (especially wraps and sandwiches)

	<p>in pairs with their support worker at first before progressing to smaller groups and then to a large group activity.</p> <ul style="list-style-type: none"> The warm up games in pairs (e.g., head, shoulders, knees, and toes) and then in larger groups (e.g., bib tag) appeared to really help break the ice- participants were laughing and connecting after this By the end of the session, participants appeared to be more confident and comfortable. This was especially evident after, for example, moments of celebration (e.g., fist pumping, yelling out) after scoring a basket 	<ul style="list-style-type: none"> The social skills were most useful to apply to other parts of life Really enjoyed that it was a fun, non-competitive environment; got to use prior sport skills, but in a fun way Reported that “headspace felt great after”; felt “chirpy” and happy Was surprised to feel so comfortable around the facilitators; enjoyed that they came up to chat, laughed at themselves, and created an easy going environment. 	<ul style="list-style-type: none"> Expressed that the session catered to all levels well- activities allowed were age appropriate and allowed for graded participation Game with whole group at the end was a favourite part of the participants and support workers <p><u>Group interview (with 2 peer support workers and 2 community workers):</u></p> <ul style="list-style-type: none"> Progression worked well to foster engagement Enjoyed the use of the watches Enjoyed the food/snacks, iced water, and electrolytes- felt well cared for Thought it was useful that the facilitators participated rather than observing/note taking Felt that it went fast; didn’t feel like exercise and were amazed by the high step count Having the support workers and facilitators involved levelled the playing field and normalised it Young people expressed that the facilitators were friendly and non-judgmental Noticed increased self-esteem and interaction amongst young people <p><u>Email response from project administration worker:</u></p> <ul style="list-style-type: none"> “I think the general feedback on the program has been very positive so far from both clients and staff.” “A few people have commented that they thought it was going to be a bit boring at first (ie: just playing basketball) and they were really happy that it involved lots of games which makes it a lot more engaging that “just playing sport”.” “I think the warm ups and games really help facilitate that social aspect and gives people of a wide range of abilities a better chance to participate. I also think the warm up games better facilitate that social aspect of sport, it’s more interactive and fun – whereas during the basketball games, it can get competitive and 	
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	<ul style="list-style-type: none"> • It was interesting to see the young people helping their support worker or one another with some of the skill learning (e.g., instruction on how to shoot properly) • Constraints (e.g. playing just in your zone at first) appeared to be helpful in increasing buy in for those with limited basketball experience • Support workers modelled participation well 	<p>Young person reported feeling very accepted, and much more open than expected</p> <ul style="list-style-type: none"> • Will attend again (10/10) <p><u>Phone interview with young person</u></p> <ul style="list-style-type: none"> • Enjoyed whole session • Favourite part was the large group basketball game and the “chilled” time at the end • Appreciated the food and the electrolytes • Will attend again (10/10) <p><u>Email response from young person:</u></p>	<p>people more skilled at basketball dominate the game.”</p> <ul style="list-style-type: none"> • “-I thought having participants physically move into spaces to indicate opinion (ie: rating yourself against the coloured cones, putting yourself into the box you agreed with) was a really useful activity. I think prompts people to gain a different insight into their beliefs when they’re asked to physically embody what they think – quite different from the “tick the box” forms we usually put clients through.” • “The activities we did at the last session were a lot of fun, and I think they were at an appropriate level for clients (and staff, aha).” • “-(The facilitators) have been wonderful to work with and the clients all seem to really like the team!” 	
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		<ul style="list-style-type: none"> • “I had a great time at the program” • “My favourite part was playing a game at the end and I also enjoyed the ball catching drills we did for skills” • “I think you did a good job supporting me” 		
	<p>What could be better:</p> <ul style="list-style-type: none"> • Skill learning felt a bit slow and basic when in pairs; could progress to more challenging activities and small groups sooner • Participants seemed comfortable moving into the large group activities sooner than expected, and appeared to 	<p>What could be better:</p> <p><u>Email response from young person:</u></p> <ul style="list-style-type: none"> • “I would like it if we played longer games and did more drills to better our basketball skills” 	<p>What could be better:</p> <p><u>Community worker phone interview (primary support worker of 2 participants):</u></p> <ul style="list-style-type: none"> • Food/informal social time phase felt rushed and cramped • More education on the importance of upping your step count in relation to health etc would be useful • Would be useful to label food (e.g., sandwich ingredients) for those with certain restrictions (*note- dietary restrictions were asked about in consent session and catered for) <p><u>Community worker phone interview (primary support worker of 1 participant):</u></p> <ul style="list-style-type: none"> • Would be useful to use more basketball specific exercises in the warm-up, or to explain rationale behind specific warm-up exercises if there aren’t basketball related 	

	<p>enjoy this the most- could get to this phase sooner</p> <ul style="list-style-type: none"> • More constraints might be needed for skilled players. At times, two individuals with basketball expertise dominated the game. • It felt a bit rushed at the end- be sure to allow time for more social interaction • The food at the end was served in a small public area- would be better in a space with more room 		<p><u>Group interview (with 2 peer support workers and 2 community workers):</u></p> <ul style="list-style-type: none"> • Felt rushed at the end; would enjoy more time playing game at end and less time in the introduction phase • Some of the skill development (e.g., shooting into hula hoops) felt too basic • Was hard to hear the facilitators at times; especially for those hearing voices <p><u>Email response from project administration worker:</u></p> <ul style="list-style-type: none"> • “During the basketball games, it can get competitive and people more skilled at basketball dominate the game” • “Given it’s a study, I think the amount of talking and explaining is probably unavoidable. But trying to minimise the amount of time standing still in a circle would be an improvement? Perhaps we can have some those conversation while doing a light warm up or stretching activity could be a little more engaging.” 	
<p>Session 2</p> <ul style="list-style-type: none"> • Indoor basketball • 4/6 participants attended • 9 support workers attended (3 	<p>What went well: Built on rapport well; able to follow up with young people on conversations from last week and form deeper connections</p>	<p>What went well:</p> <ul style="list-style-type: none"> • No participants responded to feedback requests 	<p>What went well: <u>Brief group interview in service team meeting:</u></p> <ul style="list-style-type: none"> • Staff and clients are enjoying sessions; looking forward to them • Designated room for informal social time at end was useful for interaction • Staff and clients enjoyed having more time on the court for both small and large group basketball activities/games 	<ul style="list-style-type: none"> • Have music playing and arrival activities set up upon arrival; facilitators to help set up watches and engage participants in activities (e.g., beach bats, ring toss) while waiting for others to arrive • Check in with participants throughout to ensure watch is working • Provide more sport specific examples of life skills; embed throughout sessions

<p>peer support workers)</p>	<p>Participants appeared to be more comfortable and at ease from beginning</p> <p>Helpful to have 30 minutes for cool down and social time/snacks; didn't feel rushed</p> <p>Helpful to book designated room for informal social time/snacks (too hot to be outside)</p> <p>Progression and flow went well; seemed to move from phase to phase naturally. Was helpful to provide rationale before each phase</p> <p>A facilitator was able to engage with young person who chose to sit out for most of session; participant appeared to enjoy this and engage well</p> <p>Participation levels were high</p>		<ul style="list-style-type: none"> • Progression and graded participation helpful for engagement and rapport • Young people are enjoying the vouchers; some are saving them up to buy something bigger • Providing transport helps with accountability 	
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	<p>What could be better:</p> <ul style="list-style-type: none"> • Energy levels felt lower than session 1; especially low energy in intro • Life skills component (motivation) felt a bit too academic; could be integrated into sessions better 	<p>What could be better:</p> <ul style="list-style-type: none"> • No participants responded to feedback requests 	<p>What could be better:</p> <ul style="list-style-type: none"> • One young person struggled to get watch (pedometer) to work • More sport options in voting would be helpful (water sports and hockey suggested) • Motivation levels would be low without transport support • Music during informal social time would be helpful 	
<p>Session 3</p> <ul style="list-style-type: none"> • Indoor touch rugby • 5/7 participants attended (2 new participants) • 5 support workers attended (0 peer support workers) 	<p>What went well:</p> <ul style="list-style-type: none"> • Group responded well to 2 new participants; existing participants were welcoming and friendly which was helpful (in addition to the support workers and facilitators) • A new sport that was relatively novel to all helped to level the playing field in terms of skills, and also seemed to make it an easier entry 	<p>What went well:</p> <p><u>Phone interview with young person</u></p> <ul style="list-style-type: none"> • Enjoyed whole session, found it fun and engaging • Suggested we keep doing what we are doing and “keep on keepin on” • Felt supported when chose to sit out because of headache 	<p>What went well:</p> <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • Most enjoyable components: Warm-up, game, cool down, and social/snack time • Components most useful for recovery-: The cool down and socialise phases. “All of my clients have been fairly socially isolated before joining our service, the study is a good time for them to socialise with peers” • “I thought it was beneficial choosing rugby as the skill level across the group was more evenly distributed” <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • Most enjoyable components: “The Team building and the skills part of the training. The journaling and the setting goals before the session and then after. (For the clients) The Team building exercises and working with their case manager with skills. Also exchanging skills regarding the exercises and drills.” • Components most useful for recovery: “The Tracking of steps- weight loss and exercise; healthy food offered afterwards- Weight loss and 	<p>In session modifications:</p> <ul style="list-style-type: none"> • Planned for the session to be outside but moved inside due to weather; adjusted planned activities to be executed on a court rather than a field • At least one facilitator engaging with young people sitting out • Support young people choosing to sit out, but also check in and offer alternative activities • Followed up with two young people who sat out due to headache or knee pain the next day to make sure they were alright <p>Next session:</p> <ul style="list-style-type: none"> • Make social time at end and during breaks a priority • Encourage/model use of alternative activities (and encourage support workers to do the same) • Begin embedding opportunities for young people to lead/instruct where appropriate

	<p>for new participants</p> <ul style="list-style-type: none"> • It was helpful to actively engage young people who chose to sit out during activities in alternate activities (e.g., ring toss) 		<p>encouraging healthy eating; journaling- Setting goals and taking time to reflect on them after the session.”</p> <ul style="list-style-type: none"> • My client has commented on how friendly and welcoming the students are running the programme and how she feels non-judged and comfortable while participating. 	
	<p>What could be better:</p> <ul style="list-style-type: none"> • Was challenging to balance introducing new participants to the program and making them feel comfortable while also building existing group cohesion • 3 participants sat out for a majority of the session (1 because of a sore knee from a previous injury, and 1 because of a headache after taking a ball to the head in the warm-up). Facilitators and support workers checked in with both, and both 	<p>What could be better:</p> <ul style="list-style-type: none"> • Nothing reported 	<p>What could be better:</p> <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • A full length social group following sports would be helpful for the clients’ recovery goals <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • Warm-ups were the least enjoyable component • “I think you do a really great job. I can’t think of any other ways you could support them better I think you have thought of everything 😊” 	

	<p>reported that they were fine. I chose to engage in alternative activities provided (ring toss), while the other chose to engage with their phone but reintegrated with the group at the end of the session for the cool down/social phases. One of the new participants sat out briefly to catch breath, but then returned to the activities</p> <ul style="list-style-type: none"> • Challenge: alleviating barriers that arise 'in session' e.g., (bad experience, lack of interest in sport, perception of group etc.) while remaining aware that a one size fits all program is impossible. 			
Session 4	What went well:	What went well:	What went well: <u>Feedback form from peer support worker:</u>	<u>In session:</u>

<ul style="list-style-type: none"> • Outdoor touch rugby • 2/7 participants attended • 5 support workers attended (2 peer support workers) 	<ul style="list-style-type: none"> • facilitators were reflexive-adapted well to the small group size, heat, and low energy of the group (e.g., lower intensity activities, letting them continue activities they were enjoying, etc) • interaction levels with participants were high and felt natural • high level of engagement despite low numbers 	<ul style="list-style-type: none"> • No participants responded to feedback requests 	<ul style="list-style-type: none"> • Most enjoyable components: “The warm-up sessions – pertaining to the shape-indicated balls and the game with the taggers and runners – were my most favoured parts of the session. There was lots of laughter and joking throughout.” <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • Most enjoyable components: “The rugby ball catch the tails game. Great one of the client at the group succeed throughout the game and have a very accomplished look on his face. Throughout the session both clients who attended seemed to thoroughly enjoy all components of the group. The warm up and cool down at the end of the session always appears popular with the clients and both clients seemed comfortable and relaxed as rapport has been built over the previous 4 sessions.” • Components most useful for recovery: “All social aspects of the group I feel are the most beneficial for our client’s goals as it provides an environment in which our clients can socialise in what feels like a more organic and natural setting for socialisation. (Rather than a formalised social group)” • “I feel the strength of this program, asides from the well-planned sessions, are the interpersonal skills of everyone that runs the study. A client commented to me on the way home that she will be sad to see this group end. When I suggested starting up a similar mixed sports group she agreed that would be good, but “it would not be as fun without (the facilitators)”. Structured yet casual delivery of this program has been very engaging for our clients, enabling some of them to engage in activities they otherwise would not, in a ‘youth friendly’ manner.” 	<ul style="list-style-type: none"> • Adapted session to the small group size, heat, and low energy of the group (e.g., lower intensity activities, letting them continue activities they were enjoying, allowing more time in the shade for social interaction, etc) <p><u>For next session:</u></p> <ul style="list-style-type: none"> • General thoughts for next session/future sessions or programs: Find ways to create opportunities to foster individual goals that differ markedly from the holistic goals of the group. E.g., participant with desire to develop coaching/leadership. Activities could be developed with the opportunity to support/instruct others within games
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	<p>What could be better:</p> <ul style="list-style-type: none"> • Session was on the Tuesday of Easter week which may have contributed to the low numbers 	<p>What could be better:</p> <ul style="list-style-type: none"> • No participants responded to feedback requests 	<p>What could be better:</p> <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • “For future consideration. I feel the group had less participants due to the Easter break. A large majority of our clients have dropped out of school and work. Our clients have a lot of spare time whilst their peers work or study. The Easter break has been a time when their friends and family also have some time off, so I feel they chose to socialise with their peers over attending the group.” <p><u>Feedback form from peer support worker:</u></p> <ul style="list-style-type: none"> • “I noticed some of the other people (including a young person) began engaging a tiny bit less towards the proper Touch Rugby game too. Although the activities were a medium intensity and it was stated that this was preferable, perhaps consider looking into exchanging the intensity so there’s a mix of low intensity and medium intensity games, to decrease people getting worn out before the proper game starts” 	
<p>Session 5</p> <ul style="list-style-type: none"> • Indoor field hockey • 3/6 participants attended • 6 support workers attended (2 peer support workers) 	<p>What went well:</p> <ul style="list-style-type: none"> • High levels of social engagement; participants seemed comfortable and were organically engaging in conversation with each other and the facilitators and/or support workers • Participants seemed to be 	<p>What went well:</p> <ul style="list-style-type: none"> • No participants responded to feedback requests 	<p>What went well:</p> <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • Most enjoyable components: “The Team sports at the end of the session, warm up drills, the socialising, and the friendly atmosphere.” • Components most useful for recovery: “Reflective journal writing and the breathing exercises to use when feeling overwhelmed and unable to concentrate.” • “I think it’s great that we are able to exercise in a friendly and supportive environment.” <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> • Most enjoyable components: “Main game component at the end of the session and debrief/socialise with clients. Positive comments were made in the car on the way home regarding all aspects of the session. Warm up games were 	<p><u>In session:</u></p> <ul style="list-style-type: none"> • Constraints made for more experienced players (ie must keep cones on head while playing) <p><u>For next session/future programs:</u></p> <ul style="list-style-type: none"> • Find more opportunities to embed life skills into sport session • Provide more rationale for life skills as it relates to the sport to normalise skills and increase buy in • Find more opportunities to provide leadership opportunities to young people (e.g., taking on role of captain, instructor role in ice breakers, decision making in team building activities)

	<p>happy to pair with anyone in group</p> <ul style="list-style-type: none"> Group cohesion and rapport levels appeared high 		<p>well received and clients felt more relaxed than previous weeks.”</p> <ul style="list-style-type: none"> Components most useful for recovery: “Physical health goals were mentioned in the car on the way home. One client commented that she sleeps better on the days which she engages in Play On and it has made her consider joining further sports clubs in an effort to improve her sleep and overall physical health” 	
	<p>What could be better:</p> <ul style="list-style-type: none"> Engaging stronger players in supportive roles (i.e. neutral zones) Lack of congruence of the life skills within the session; create more opportunity to embed life skills within sporting activities. Finding the rationale behind players sitting out. Some players with lower levels of confidence appeared to be deterred by others playing with more intensity. 	<p>What could be better:</p> <ul style="list-style-type: none"> No participants responded to feedback requests 	<p>What could be better:</p> <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> “The amount of time spent on Ice breakers hence we are on week 5 of play on I felt it could be shorter as we all know each other.” “I feel like giving the young people some responsibility and enabling them to take on some leadership roles would be useful.” <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> “Consider allowing some clients to take on leadership positions in sports. Eg. rotating team captains etc. This could help develop confidence and rapport within the group.” 	

	<ul style="list-style-type: none"> Although participants were more engaged socially, they were less engaged in the sport components 			
<p>Session 6</p> <ul style="list-style-type: none"> Indoor field hockey 1/6 participants attended 6 support workers attended (2 peer support workers) 	<p>What went well:</p> <ol style="list-style-type: none"> Adapted to low participant numbers. Young person did not seem to mind, and support workers participated as normal Low intensity of activities led to more interaction and more team building components, opportunities to build team cohesion More opportunities to encourage leadership roles (e.g. each person had to choose a strategy) 	<p>What went well:</p> <ul style="list-style-type: none"> No participants responded to feedback requests 	<p>What went well:</p> <p><u>Feedback form from support worker:</u></p> <ul style="list-style-type: none"> Most enjoyable components: “The game where we sent different amounts of attackers/defenders depending on how many points we were after. It was good to see the client make some decisions and be involved in the strategy of the game. Unfortunately, none of my clients made it to the group this week. However, (the participant in attendance) appears more at ease in the group, more spontaneous in conversation with staff and play on facilitators and had built good rapport across the participants.” Components most useful for recovery: “Socialisation in what feels like a more natural and organic setting. I feel that the Play On study provided a great structured yet informal way for our clients to socialise.” “Elements and opportunities to delegate leadership to clients was a great way of involving and empowering them within the group. Building on interpersonal skills and confidence which they can take into their own life.” <p><u>Feedback form from peer support worker:</u></p> <ul style="list-style-type: none"> Most enjoyable components: “The social interaction and the mini game where we had to choose the difficulty level and you didn’t know what the other team’s strategy was.” 	

			<ul style="list-style-type: none"> • Components most useful for recovery: “Team building and working together to play a sport. This promotes socialisation, having fun and exercise.” • “All of what we were working on together tied in really well and skills/teamwork we can all apply in life.” • “I though <p><u>Feedback form from peer support worker:</u></p> <ul style="list-style-type: none"> • Most enjoyable components: “Game of choosing which number of points to score/how many players to send in to attack/defend.” • Components most useful for recovery: “Physical activity, socialisation, reflecting on what they’ve gained from attending and how they can implement it in their life.” • “I thought it was an excellent program and very relevant/useful.” 	
	<p>What could be better:</p> <ul style="list-style-type: none"> • Session felt a bit slow in general- could have upped the intensity in warm up activities (lowest level of physical activity in warm up) • Difficult have final debrief as planned due to low participant numbers, but still useful to test components 	<p>What could be better:</p> <ul style="list-style-type: none"> • No participants responded to feedback requests 	<p>What could be better:</p> <p><u>Feedback form from peer support worker:</u></p> <ul style="list-style-type: none"> • “Having a longer program? It went so quickly” • “Just having more of a consistent larger client base, which unfortunately we had no control over” 	

Table S5.2. *Process Evaluation Using the MRC Guidance for Process Evaluation*

Function	Data Sources	Relevant Questions	Study Findings	Future Questions
Description of intervention and its causal assumptions	<p>Development of a model through intervention mapping, including:</p> <ul style="list-style-type: none"> narrative review interviews with stakeholders (young people with FEP and their clinicians) discussions with service providers inclusion of relevant evidence based change mechanisms 	What are the causal assumptions underpinning the intervention?	<p>Study assumptions:</p> <ul style="list-style-type: none"> Important components of FEP functional recovery include physical activity, social connectivity, and life skills development Sport is a useful platform to foster physical activity, social connectivity, and life skills development Therefore, a sport-based life skills program for young people with FEP should provide functional recovery benefits 	<ul style="list-style-type: none"> How can sport be maximised to best foster levels of physical activity, social connectivity, and life skills development in young people with FEP? What program components yield long term benefits? What types of sport are most conducive to functional recovery in FEP?
Implementation	<ul style="list-style-type: none"> Participant feedback Participant interviews Facilitator observation and reflection notes 	Implementation Process: How is delivery achieved (e.g., training, support, resources)?	<ul style="list-style-type: none"> Facilitators had Masters level qualifications in sport and exercise psychology, and experience in playing and coaching sport, sport program delivery/development, and/or sport/exercise science or pedagogy Facilitators received training re: FEP psychoeducation The service provided critical support via design feedback, recruitment, transport, participation, and feedback during and after the intervention The service reported that the overall burden was manageable and that the support provided was within their functional recovery role 	<ul style="list-style-type: none"> How can the support from the service be maximised, but the burden be minimised? How can individual transport for the young people with FEP be supported?

			<ul style="list-style-type: none"> The service reported that the time required for transport was manageable for the 6 weeks, but unsustainable long term. Suggestions from the service to mitigate this include: working with a more established service (a larger client base may result in less geographic spread of clients, and a more established relationship with the clients would enable conversations and planning for individual transport), and a longer program (to enable time for conversations/planning re individual transport) 	
		<p>What is delivered:</p> <ul style="list-style-type: none"> Fidelity: Was the intervention delivered as intended? 	<ul style="list-style-type: none"> The intervention was delivered as intended, with subtle modifications made throughout 	<ul style="list-style-type: none"> How can the intervention format be delivered in other formats (e.g., via other service providers, as a RCT)
		<ul style="list-style-type: none"> Dose: What was the quantity of the intervention implemented? 	<ul style="list-style-type: none"> The intervention was offered once a week for 2 hours for 6 weeks The service, facilitators, and participants all reported that this was not sufficient time for the secondary outcomes to be developed or measured 	<ul style="list-style-type: none"> What quantity of intervention will maximise functional recovery benefits?
		<ul style="list-style-type: none"> Adaptations: What adaptations were made in the implementation phase? 	<ul style="list-style-type: none"> Modifications included participation of all facilitators (rather than active observation/note taking), faster progression to group activities, and opportunity for participants to vote on sport utilised 	<ul style="list-style-type: none"> What adaptations need to be made to deliver the intervention in other formats (e.g., via other service providers, as a RCT, within other

				cultures or regions, with other sports)
		<ul style="list-style-type: none"> • Reach: Does the intended audience come into contact with the intervention, and how? 	<ul style="list-style-type: none"> • The reach extended only to clients of the service partner 	<ul style="list-style-type: none"> • How can the reach be extended to other young people with FEP?
Mechanisms of impact	<ul style="list-style-type: none"> • Participant feedback • Participant interviews • Facilitator observation and reflection notes • Attendance and engagement records • Measurement engagement records and outcomes • Session plans/Modification records 	How did the delivered intervention produce change?	<ul style="list-style-type: none"> • Alignment between program offerings and young people's recovery goals fostered motivation • Environmental enablers fostered recruitment, attendance and engagement (i.e., structure, facilitators, staff participants) <ul style="list-style-type: none"> ○ Evidence based change methods embedded in the structure promoted skill development and recovery methods • Logistical support (i.e., transport, food, reimbursement) enabled recruitment, attendance, and engagement • Attendance and engagement led to recovery benefits, skill development, and transfer (see results section for details) 	<ul style="list-style-type: none"> • What components produced the most change? • How can change be sustained? • How can intervention components be more engaging and youth friendly?
		How did the participants respond to and interact with the intervention?	<ul style="list-style-type: none"> • Attendance for young participants was 46.9% • When in attendance, participation levels were high for all participants • Feedback collected from young participants during and after the 	<ul style="list-style-type: none"> • How can attendance and engagement be further supported? • How can we collect feedback from those who did not participate?

			<p>intervention was overwhelmingly positive</p> <ul style="list-style-type: none"> • Feedback from staff participants suggested that participating in the program was positive and beneficial for the young people 	<ul style="list-style-type: none"> • How can co-design be implemented more?
		How did the facilitators impact the intervention?	<ul style="list-style-type: none"> • The participants reported that the welcoming and engaging nature of the facilitators was critical to engagement and normalisation • The participants and facilitators reported that inclusion of staff participants was critical for modelling and normalisation, and that they played an important role in creating a safe and supportive environment • The staff participants were critical for the recruitment and transport of young people 	<ul style="list-style-type: none"> • What is the cost/benefit analysis of utilising multiple facilitators and staff participants? • How can young people be supported to facilitate their own transport?
		What were the unexpected pathways and consequences?	<ul style="list-style-type: none"> • The value of the staff participants for modelling and normalisation was underestimated • The benefits for the therapeutic relationship between the young people and the service staff (e.g. rapport building and power differential balancing) were unexpected • The challenges of recruitment and retention were greater than expected • The challenges of working with a young service were greater than expected 	<ul style="list-style-type: none"> • Will an established service be able to provide the necessary level of support? • What is the most beneficial facilitator to staff to young person ratio?

Outcomes	<ul style="list-style-type: none"> Participant feedback Participant interviews Facilitator observation and reflection notes Attendance and engagement records Measurement engagement records and outcomes 	<p>Primary: Is a sport-based life skills program for young people with FEP feasible and acceptable?</p>	<ul style="list-style-type: none"> The results provide a compelling preliminary case for the feasibility and acceptability of a sport-based life skills for young people with FEP, and suggest that future work in this area is warranted The results reveal the importance of partnering with a service for all phases of the intervention, and suggest that feasibility will be increased through collaboration with an established service 	<ul style="list-style-type: none"> Is a longer (e.g., 12 week) sport-based life skills program for young people with FEP feasible and acceptable? Are there other sport based formats that would be more feasible/acceptable?
		<p>Secondary: Did the participants demonstrate changes in:</p> <ul style="list-style-type: none"> Life skills development Physical activity levels Social engagement levels Psychosis recovery? 	<ul style="list-style-type: none"> The results indicate a positive trend in the secondary outcomes, and call for further investigation (see the results section for more details) 	<ul style="list-style-type: none"> Does a sport-based life skills program for young people with FEP produce changes in: <ul style="list-style-type: none"> Life skills development Physical activity levels Social engagement levels Psychosis recovery?
Context	<ul style="list-style-type: none"> Participant feedback Participant interviews Facilitator observation and reflection notes 	<p>How did context impact implementation and outcomes?</p>	<ul style="list-style-type: none"> The research study format (as opposed to a general functional recovery program provided by the service) may have impacted recruitment levels The large catchment area of the service strengthened recruitment and transport challenges 	<ul style="list-style-type: none"> How does working with an established service impact recruitment, retention, and outcomes? How does a longer program impact recruitment, retention, and outcomes?

			<ul style="list-style-type: none">• The newness of the service limited recruitment and retention (e.g., because of low client numbers and unestablished therapeutic relationships with clients)• The short length of the intervention limited the development of secondary outcomes	
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Table S5.3. *Process Evaluation Using the Bowen et al. 's (2009) Framework for Feasibility Studies*

Area of focus	Data Sources	Relevant questions	Study Findings	Future Questions
Acceptability	<ul style="list-style-type: none"> Participant feedback Participant interviews Facilitator observation and reflection notes 	To what extent was the program judged as suitable, satisfying, or attractive to participants?	<ul style="list-style-type: none"> Feedback collected from young participants during and after the intervention was overwhelmingly positive Feedback from staff participants suggested that participating in the program was positive and beneficial for the young people 	<ul style="list-style-type: none"> How can we the program and enjoyment? How the program be marketed to make it more attractive? How can young people with FEP be more involved in the design process?
Demand	<ul style="list-style-type: none"> Participant feedback Participant interviews Attendance and engagement records 	What is the demand for such a program?	<ul style="list-style-type: none"> Participants reported the need for a program that promotes physical activity, social connection, and life skills development in an engaging and normalised way Participants reflected on the novelty of this program, and how it is unlike any other resources they have or have been offered 	What regions, services, and/or phases of recovery are most in demand of such a program?
Implementation	<ul style="list-style-type: none"> Participant feedback Participant interviews Facilitator observation and reflection notes Attendance and engagement records Modification records 	To what extent can the program be successfully delivered?	<ul style="list-style-type: none"> Successful delivery was enabled through: <ul style="list-style-type: none"> rigorous program design process (intervention mapping) 	<ul style="list-style-type: none"> How can the support from the service be maximised, but the burden be minimised? How can stakeholders be further involved in the implementation process?

			<ul style="list-style-type: none"> ○ support from the service ○ qualified facilitators ○ flexible design 	
Practicality	<ul style="list-style-type: none"> ● Participant feedback ● Participant interviews ● Facilitator observation and reflection notes ● Attendance and engagement records 	To what extent can the program be carried out with intended participants using existing means, resources, and circumstances and without outside intervention?	<ul style="list-style-type: none"> ● Outside intervention was utilised by way of bringing an external program to an existing service. 	<ul style="list-style-type: none"> ● How could existing services implement the program with existing resources? ● What collaborations could enable limited outside resource use (e.g., university and service)?
Adaptation	<ul style="list-style-type: none"> ● Participant feedback ● Participant interviews ● Facilitator observation and reflection notes ● Session plans/Modification records 	To what extent does the program perform when changes are made for a new format or with a different population?	<ul style="list-style-type: none"> ● N/A 	<ul style="list-style-type: none"> ● What adaptations need to be made to deliver the intervention in other formats (e.g., via other service providers, as a RCT, within other cultures or regions, with other sports)?
Integration	<ul style="list-style-type: none"> ● Participant feedback ● Participant interviews ● Facilitator observation and reflection notes ● Session plans/Modification records 	To what extent can the program be integrated within an existing system?	<ul style="list-style-type: none"> ● The program was integrated into the functional recovery resources of an existing service 	<ul style="list-style-type: none"> ● How could a long term program be integrated sustainably into existing services?
Expansion	<ul style="list-style-type: none"> ● Participant feedback ● Participant interviews ● Facilitator observation and reflection notes 	To what extent can a previously tested program be expanded to provide a new program?	<ul style="list-style-type: none"> ● N/A 	<ul style="list-style-type: none"> ● How can a full-scale version of the program be implemented?

	<ul style="list-style-type: none"> • Session plans/Modification records 			
Limited efficacy	<ul style="list-style-type: none"> • Participant feedback • Participant interviews • Facilitator observation and reflection notes • Attendance and engagement records • Measurement engagement records and outcomes 	Does the program show promise of being successful with the intended population, even in a highly controlled setting?	<ul style="list-style-type: none"> • The results indicate that the program could be successful with the right service partner and facilitators, and design catered specifically to the population 	<ul style="list-style-type: none"> • Would a full-scale version of the program yield functional recovery benefits?

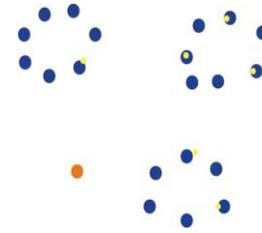
File S5.1. *Intervention Session Plans Week 1-6*

Session 1: Basketball (indoor)				
<p><i>Key Session Outcomes:</i> 1) Building rapport; 2) Physical activity; 3) Social interaction; 4) Skill development / confidence</p> <p><i>Materials needed:</i> basketballs (10-20), ball pump, cones (30), bibs (20), first aid kit, alternative activities (e.g., ring toss, skittles, beach bats), water, snacks, speaker</p> <p><i>Note:</i> Facilitators are to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities</p>				
PHASE	TIMING	KEY COMPONENTS TO TARGET	ACTIVITIES	KEY TEACHING/FACILITATING POINTS
INTRODUCTION ICE BREAKER(S)	20 min	<ul style="list-style-type: none"> • set expectations • build comfort/familiarity with group and program • get to know names 	<ul style="list-style-type: none"> • Acknowledgement of country: <ul style="list-style-type: none"> ○ “We wish to acknowledge the traditional custodians of the land we are meeting on, the Whadjuk people. We would like to acknowledge the strength, resilience and capacity of Noongar people in this land.” • Introduction (introduce facilitators) • Housekeeping <ul style="list-style-type: none"> ○ toilets, water, snacks, other activities, breaks, structure of session • Ice breakers <ul style="list-style-type: none"> ○ 1. this or that: create a line on the court with cones, present opposing preferences and have people go to one side of the line or the other depending on their preference(dogs or cats; vanilla or chocolate; coffee or tea; Eagles or Dockers; summer or winter; sunrise or sunset; 	Run by 1 facilitator, others participate Facilitators to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities

			<p>hamburger or hot dog, tomato or tomato; rover or ocean; Nutella or peanut butter)</p> <ul style="list-style-type: none"> ○ 2. ball pass/name game (say name and fav sport/team) ● Ground rules/expectations (group discussion with whiteboard; have group come up with list and prompt if any of the below aren't discussed) <ul style="list-style-type: none"> ○ Respect ○ Listen to your body/needs ○ Support others ○ Give it a go/challenge by choice ○ Come in the right mind (sober) ● Set Up <ul style="list-style-type: none"> ○ watches ○ workbooks (name on outside; inside: one thing you hope to get out of the session; # of steps you think you might do in today's session) 	
PHYSICAL WARM UP	10 min	<ul style="list-style-type: none"> ● elevated heart rate ● movement in major muscle groups ● social interaction/familiarity ● priming for physical skills required for day (e.g., hand-eye coordination, reflexes, spatial awareness) 	<ul style="list-style-type: none"> ● Dynamic movement and activities <ul style="list-style-type: none"> ○ Pairs: <ul style="list-style-type: none"> ▪ HSNT/Cone: (best 2/3): In pairs with 1 cone per pair. Facilitator calls out “head, shoulders, knees, toes, cone” in random order. Participants are to touch different parts on their own body when called. When “cone” is called, participants compete to grab the cone first. ▪ Tennis ball reflex challenge: In pairs with 2 tennis balls per pair. Partners face each other 1.5 arm length apart. One partner holds 2 tennis balls out in front at shoulder height with arm extended; other partner stands with hands behind back. Partner with balls 	Run by 1 facilitator, others participate or engage with those on sideline

			<p>randomly drops 1 ball; goal is for other partner to catch ball before it hits the ground. Challenge; drop 2 balls at once</p> <ul style="list-style-type: none"> ○ Group: <ul style="list-style-type: none"> ▪ Chasing game: “Bib Tag”. Two players attempt to catch group members (‘runners’) by throwing a soft bib they each possess. If a player is caught they stand ‘stuck’ at that point until another runner releases them by tapping them on the shoulder. ▪ The area played in is relative to the size of the group allowing enough space for players to move safely without collision. (e.g., 10 players = 25m x 25m area). ▪ Progression of the game - Once a runner is caught, instead of becoming stuck they go to pick up a spare bib and join the initial tagger(s) in catching remaining runners. <p>*To adjust the challenge the following adaptations were made where needed:</p> <ul style="list-style-type: none"> ▪ For those struggling: <ul style="list-style-type: none"> ● Inclusion of rest zone to the side of playing area that could be used when needed <ul style="list-style-type: none"> ○ Provide individual players with a small cone that may be used as a shield to deflect bibs that are thrown towards them. ▪ For those striving: 	
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			<ul style="list-style-type: none"> • Constraining their movement style. (e.g., instead of running freely, they must sidestep or race walk) • Providing a 'balance hat' in the form of a small cone. The player must keep this on their head without using their hands whilst moving around the area. 	
(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation (water, electrolytes, snacks available).		
SKILL LEARNING	20 min	<ul style="list-style-type: none"> • Shooting • Passing • Dribbling 	<p>Basketball confidence meter: "How's your basketball confidence?" Create a line of cones going from red to yellow to green; have participants and facilitators line up according to their basketball confidence/experience- red being low confidence/experience; green being high.</p> <p>Passing introduction: Players are each numbered from 1 to n within small groups (e.g., 4-6 players). Players start by passing in order (i.e., 1 to 2, 2 to 3, etc.) Players are then instructed to move ball around in a chest pass, bounce pass, and overarm passing techniques.</p> <p>Progression: Instructions are then called out that all groups follow while still passing. (1) Reverse = reverse the passing order (e.g., 3 to 2, 2 to 1 etc.). (2) Switch= move your ball to the next group clockwise (3) Rotate = move your whole group to change position with another group.</p>	<ul style="list-style-type: none"> • Run by 1 facilitator; others participate or engage with those on sideline • Can be creative and adaptive levels to make harder/easier.



Shooting Challenges: In pairs, players take a ball and hoop and find a safe space in the hall to practice the below levels in order. Once they have mastered the level successfully (i.e., consistent completion), they move on to the next. Each pair can be at a different level to the others within the group.

Levels:

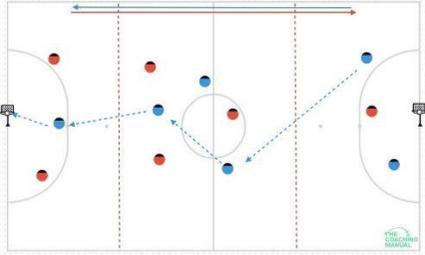
1. Shoot into partner's hands
2. Shoot over partner (arms by sides) into hoop 2m away
3. As level 2 but partner can now raise arms to block
4. Partner can now jump to block also
5. Both players now have hoops and play 1v1 game
6. Players then use hoop to practice 1 v1 shooting

Contingency game idea

If participants find the paired shooting challenges too easy or prefer a group based game:

Shooting Alamo. Two queues start at either end of the court. One at a time players dribble up to a cone and attempt to shoot into the hoop (distance of cone from hoop can be adjusted to adapt challenge). Once a player has shot they retrieve their ball and join the opposite queue and wait to shoot down the opposite end. The players try to score as many times in a set period of time.

(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation (water, electrolytes, snacks available).		
PLAY	30 min	<ul style="list-style-type: none"> • skill execution/ demonstration • teamwork/social interaction 	<p>Zone ball</p> <p>Players are organised into two even teams on a regular basketball court with players spread across three separate zones (see figure xx). The aim is of the game is to score by throwing the ball through the hoop their team is attacking. The following rules are applied to allow players to adapt to the challenge:</p> <p>5. Players cannot move with ball and must stay in zone (passing between each other only)</p>	<ul style="list-style-type: none"> • Run by 2 facilitators, other participates or engages with those on sideline • Provide opportunities for graded

			<p>6. Players can now move three steps when in possession of the ball but must still remain in their zone.</p> <p>7. Players can now move into the zone closest to them if they pass the ball into that zone.</p> <p>8. Players can now move freely (no step limit) with their zone and with step 3 still applied.</p> <p>Finally, players move into a regular basketball game and are able to move freely between all zones with no constraint on steps taken.</p>  <p>*To adjust the challenge the following adaptations were made where needed:</p> <p>Struggling</p> <ul style="list-style-type: none"> ● 3m safe zone = opposition players must stay 3 steps back from player in possession. ● Add neutral player to support attacking team. The team with the ball will always therefore have an extra player. ● Retreat rule. = opposition must move back to their half when ball is played from baseline. <p>Striving</p> <ul style="list-style-type: none"> ● Three second rule = these players are only allowed to possess the ball for three seconds at a time. ● Constrain advanced players to dribble with only less dominant hand. 	<p>participation if necessary</p>
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(BREAK)	3 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation (water, electrolytes, snacks available).		
COOL DOWN/DEBRIEF	10 min	<ul style="list-style-type: none"> • lower heart rate • catch breath • stretch major muscle groups • begin habit of reflection 	<ul style="list-style-type: none"> • Find someone to walk with to the other side of the court and back and share your favourite part of the session • Hamstring stretches- grass grazers (step forward while sweeping arms toward ground) • Reach arms up (deep breath in)/ reach to toes/knees/shins (breath out) x 3 • Repeat confidence meter and have participants compare to where they were at the beginning of session 	Run by 1 facilitator; others to fetch food out of refrigerator and set up
SOCIAL TIME/ SNACKS	15-20 min	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily 	light snacks (i.e., wraps, sandwiches, fruit) and water/electrolytes available	<ul style="list-style-type: none"> • Ask participants to return watches and record steps taken • Distribute vouchers • Facilitators to engage young people in casual conversation

FACILITATOR REFLECTION	30 min (post session)	<ul style="list-style-type: none"> • good, better, how approach • to promote reflection and begin to plan modifications for next week 	<ul style="list-style-type: none"> • Good, better, how: <ul style="list-style-type: none"> ○ RE: outcomes, logistical, design, overall (timing, progression, engagement, level, interaction, food, breaks, adverse events) • What went well? • What could be better and how? • How were the program components in relation to skill level? • How was the flow? • How was the timing? • How were the engagement levels? • How was interaction with the participants? • How did the team manage adverse events? • What modifications need to be made for next week? 	
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Session 2: Basketball (indoor)

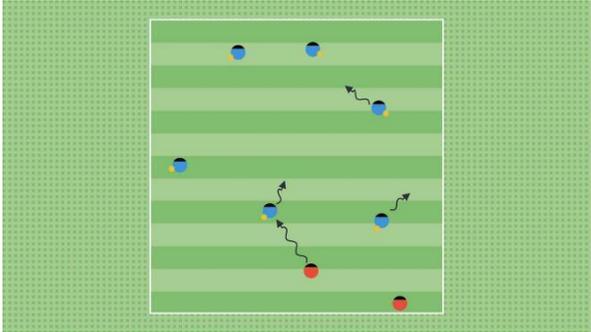
Key Session Outcomes: 1) Building rapport/building trust; 2) Social interaction; 3) Skill development / confidence; 4) Mental skills training: motivation; 5) Increased physical activity

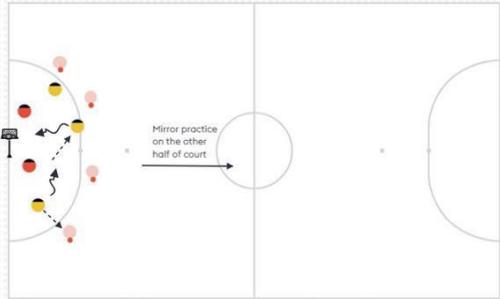
Materials needed: basketballs (10-20), ball pump, cones (30), bibs (20), first aid kit, alternative activities (e.g., ring toss, skittles, beach bats), water, snacks, speaker

Note: Facilitators are to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities

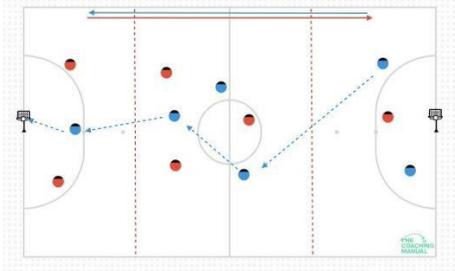
PHASE	Time	KEY COMPONENTS TO TARGET	ACTIVITIES	KEY TEACHING/ FACILITATING POINTS
INTRODUCTION	15 min	<ul style="list-style-type: none"> • reminder of expectations • build comfort/familiarity with group and program • get to know names 	<p>Arrival Activity: skittles, beach bats, ring toss etc.; music</p> <p>Acknowledgement of Country: same as session 1</p> <p>Welcome</p> <ul style="list-style-type: none"> • Introductions Housekeeping reminders (toilets, snacks, breaks, etc) • recap expectations created as a group in week 1 (while adding basic stretches- calf raises; leg swings; lunges) <p>Ice breaker: get in order of birthdays; share birthday and name</p> <p>Life Skills</p> <ul style="list-style-type: none"> • “Find your Why” <ul style="list-style-type: none"> ○ intrinsic vs. extrinsic motivation discussion (present as red vs. green motivation) 	<ul style="list-style-type: none"> • Engage participants in casual conversation upon arrival • Give participants watches and as they arrive (optional) • Encourage participants to engage in arrival activity (beach bats, ring toss, etc.) • Run by 1 facilitator, others participate

			<ul style="list-style-type: none"> ○ brainstorm reasons “why” people might play sport as group ○ individuals to record their red vs. green “whys” for coming to program in workbook ● Set up watches- guess how many steps? (record in workbook; closest from last week picks music) 	
PHYSICAL WARM UP	10-15 min	<ul style="list-style-type: none"> ● elevated heart rate ● movement in major muscle groups ● social interaction/ familiarity ● priming for physical skills required for day (e.g., hand-eye coordination, reflexes, spatial awareness) ● 	<p>Dynamic movement</p> <ul style="list-style-type: none"> ● HSNT/Cone:(best $\frac{2}{3}$): In pairs with 1 cone per pair. Facilitator calls out “head, shoulders, knees, cone” in random order. Participants are to touch different parts on their own body when called. When “cone” is called, participants compete to grab the cone first (challenge: turn around) <p>Foxes and farmers tag (see diagram)</p> <ul style="list-style-type: none"> ● One participant starts as the catcher (farmer) ● All other participants start as runners (foxes) ● Foxes begin with a bib tucked into the back of their shorts ● The farmer aims to run around and remove bibs from the foxes. ● If a fox loses their bib they then become a farmer. 	<ul style="list-style-type: none"> ● Run by 1 facilitator, others participate or engage with those on the sideline ● In head, shoulders, knees, and cone- facilitator to walk around so everyone can hear ● facilitators to explain why (in relation to basketball) during explanation (e.g., physical mobility, warming up major muscle groups, injury prevention, spatial awareness, reflexes, etc)

			<ul style="list-style-type: none">• The last fox in the box is the winner. 	
(BREAK)	3 min	5.6. To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.		

<p>SKILL LEARNING</p>	<p>20 min</p>	<ul style="list-style-type: none"> • recap shooting/passing • dribbling • defending • social interaction • physical activity 	<p>Confidence meter: how is this different than last week? (create a line of cones going from red to yellow to green; have participants and facilitators line up according to their basketball confidence/experience- red being low confidence/experience; green being high).</p> <p>Skill development</p> <ul style="list-style-type: none"> • 3 on 2 defense and attack (2 defenders vs 3 attackers; 1-2 in the rest zone; rotate after each score) <ul style="list-style-type: none"> ○ challenge: 3 defenders vs. 2 attackers ○ option: progress via wave practice to integrate whole group • Team Shoot off: 2 teams aiming to score from four balls against two defenders.  <ul style="list-style-type: none"> • Constraints (from attackers perspective) <ul style="list-style-type: none"> ○ Struggling: Defenders must hold bib together whilst defending ○ Striving: Must shoot within 15 seconds of picking ball up off the cone 	<ul style="list-style-type: none"> • 2 facilitators to deliver, 1 to participate or engage with those on the sideline • facilitators to encourage reciprocal learning and increased challenges in skill development • facilitators to take mental notes of participants helping/coaching/supporting one another • add water break in middle if needed • facilitators to prompt use of life skill (motivation) where appropriate
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			<ul style="list-style-type: none"> ○ Progression: Can you score more points than the team in the opposite half 	
(BREAK)	3 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.		
PLAY	30 min	<ul style="list-style-type: none"> • skill execution/demonstration • teamwork/social interaction • physical activity • opportunity to use life skill (“find your why”) 	<p>Zone ball</p> <p>Players are organised into two even teams on a regular basketball court with players spread across three separate zones (see figure xx). The aim is of the game is to score by throwing the ball through the hoop their team is attacking. The following rules are applied to allow players to adapt to the challenge:</p> <ol style="list-style-type: none"> 1. Players cannot move with ball and must stay in zone (passing between each other only) 	<ul style="list-style-type: none"> • delivered by 1 facilitator; 2 to participate or interact with those on the sideline • be aware of bib sizing when determining teams • be aware of skill level when assigning teams (strongest players on opposite teams) • add water breaks throughout if needed

			<ol style="list-style-type: none"> 2. Players can now move three steps when in possession of the ball but must still remain in their zone. 3. Players can now move into the zone closest to them if they pass the ball into that zone. 4. Players can now move freely (no step limit) with their zone and with step 3 still applied. <p>Finally, players move into a regular basketball game and are able to move freely between all zones with no constraint on steps taken.</p>  <p>*To adjust the challenge the following adaptations were made where needed:</p> <p>Struggling</p> <ul style="list-style-type: none"> ● 3m safe zone = opposition players must stay 3 steps back from player in possession. ● Add neutral player to support attacking team. The team with the ball will always therefore have an extra player. 	<ul style="list-style-type: none"> ● facilitators to prompt use of life skill (motivation) where appropriate
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			<ul style="list-style-type: none"> Retreat rule. = opposition must move back to their half when ball is played from baseline. <p>Striving</p> <ul style="list-style-type: none"> Three second rule = these players are only allowed to possess the ball for three seconds at a time. Constrain advanced players to dribble with only less dominant hand. 	
COOL DOWN/DEBRIEF	10 min	<ul style="list-style-type: none"> lower heart rate catch breath social interaction begin habit of reflection 	<p>Cool down</p> <ul style="list-style-type: none"> walk with another: share one thing the other person did well and/or fav part of session? Reach arms up (deep breath in)/ reach to toes/knees/shins (breath out) x 3 confidence meter- compare to beginning of session <p>Debrief</p> <ul style="list-style-type: none"> encourage participants to reflect on “find your why” for session in notebooks- what kept you motivated? prompt “find your why” reflection/discussion for other areas in life- what is your motivation for other areas of life? How can you increase your “green” motivation? 	one facilitator to deliver; two others to set up food etc.

			Note: next week's sport: ultimate frisbee, touch rugby, soccer	
SOCIAL TIME/ SNACKS	20 min	<ul style="list-style-type: none"> informal social interaction rehydrate and refuel healthily 	light snacks (i.e., wraps, sandwiches, fruit) and water/electrolytes available	<ul style="list-style-type: none"> Ask participants to return watches and record steps taken Distribute vouchers Facilitators to engage young people in casual conversation
FACILITATOR REFLECTION	30 min (post session)	(same as session 1)	(same as session 1)	

Session 3: Touch Rugby (indoor)

Key outcomes: 1) Building rapport/building trust; 2) Social interaction; 3) Skill development / confidence; 4) Increased physical activity; 5) Mental skills training: goals

Materials needed: Equipment: rugby balls (10-20), cones (30), bibs (20), first aid kit, alternative activities (e.g., ring toss, skittles, beach bats), water, snacks

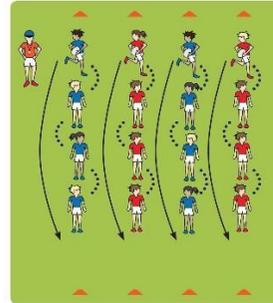
Note: Facilitators are to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities

PHASE	TIMING	KEY COMPONENTS TO TARGET	ACTIVITIES	KEY TEACHING/ FACILITATING POINTS
INTRODUCTION /ICE BREAKER(S)	20 min	Build rapport and familiarity, foster social interaction, introduce mental skills component	<p>Arrival Activity: skittles, beach bats, ring toss etc.; music</p> <p>Acknowledgement of Country: same as session 1</p> <p>Welcome: introductions, housekeeping reminder; recap expectations (while adding in basic stretches- calf raises; leg swings; lunges)</p> <p>Ice breaker: find someone else; learn name and favourite meal to cook or have cooked for them; introduce partner to group</p> <p>Life skills</p> <ul style="list-style-type: none"> • Check in: “Find your Why”- did you notice red/green motivation in your life? Connect motivation to goal setting • Set up watches (closest steps from last week picks music) 	<ul style="list-style-type: none"> • Engage participants in casual conversation upon arrival • Give participants watches and as they arrive (optional) • Encourage participants to engage in arrival activity (beach bats, ring toss, etc.) • Run by 1 facilitator, others participate

			<ul style="list-style-type: none"> • Action goals <ul style="list-style-type: none"> ○ Something in the here and now that is measureable; important in sport training ○ Includes What? How? and Why? components ○ Have each person set an action goal; write in workbook and include what, how, and why elements. (ex: number of steps per session, participate in all activities, get to know someone new) 	
PHYSICAL WARMUP	10 min	<ul style="list-style-type: none"> • elevated heart rate • movement in major muscle groups • social interaction/familiarity • priming for physical skills required for day (e.g., hand-eye coordination, reflexes, spatial awareness) 	<p>Over/under Relay</p> <ul style="list-style-type: none"> • Participants start in queues of 5 to 7 with the person at the front of each queue starting on line 1 with a ball in their hands (see diagram) • On the ‘go’ the teams pass the ball between them in an ‘over-under’ fashion whereby the first person passes the ball over their head followed by the second person passing the ball between their legs and so on. • When the ball reaches the final person they run to the front of the queue one step ahead of the person behind them and begin the process again. • The aim is for the queues to race by progression their queue forwards in this manner towards the finish line (line 2 in diagram) <ul style="list-style-type: none"> Progressions: <ul style="list-style-type: none"> - Alternate the challenge to ‘side to side’ (i.e., moving the ball around the left 	<ul style="list-style-type: none"> • Run by 1 facilitator, others participate or engage with those on the sideline • facilitators to explain why (in relation to rugby) during explanation (e.g., physical mobility, warming up major muscle groups, injury prevention, spatial awareness, reflexes, etc

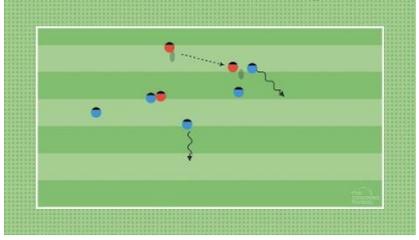
hand side of your body followed by the next person moving it around their right hand side)

- Combine a combination of over-under and side to side (i.e. “a over- under-side-side” pattern)



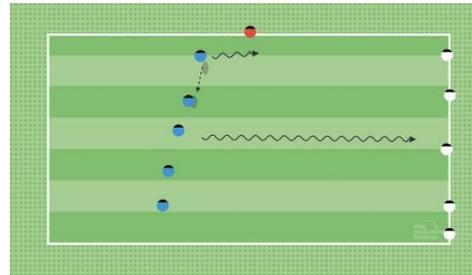
Ball Tag

- One participant starts at the tagger with a ball in their hands.
- The rest are runners and find a space within a set, safe space (diagram 1)
- The aim is for the tagger to run and touch another participant with the ball.
- Once a player is tagged, they become the tagger and must now chase the other players.
- The game comes to an end after a set period of time (e.g., 2 minutes)

			 <p>Progression</p> <ul style="list-style-type: none"> • Instead of the person being tagged switching with the tagger, they now join the tagger in catching the remaining runners. The ball may be passed between the taggers to tag runners. As more players are tagged, the more players the one ball can be passed between to catch the remaining runners.  <p>Contingency:</p> <ul style="list-style-type: none"> ➤ For participants who don't feel comfortable with the game environment individual ball handling challenges can be set. For example, Moving ball around body, Throw-clap-catch, figure of 8 (in and around legs) etc. 	
(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.		

<p>SKILL LEARNING</p>	<p>20 min</p>	<ul style="list-style-type: none"> comfort with rugby ball, rugby rules familiarity, passing, spatial awareness, 	<p>Confidence meter: 1) touch rugby confidence; 2) confidence in ability to give it a go</p> <p>Wave passing drill</p> <ul style="list-style-type: none"> Participants start in groups of 4 to 6 standing side by side along a starting line (see diagram x.x) On the command they aim to pass the ball along their line whilst running across to the finish line as a group During this they must adhere to simple rules including: <ol style="list-style-type: none"> Passing the ball either sideways or backwards Passing and receiving whilst moving in a forwards direction Everyone must make or a receive a pass on each run through Once the group has finished, the next group waiting at the finish line begins in the opposite direction (i.e., Wave 2). Progressions Challenges are added that included the following <ul style="list-style-type: none"> Try to make as many passes as possible on each run (go all the way along and back) 	<ul style="list-style-type: none"> 2 facilitators to deliver, 1 to participate or engage with those on the sideline facilitators to encourage reciprocal learning and increased challenges in skill development facilitators to take mental notes of participants helping/coaching/supporting one another add water break in middle if needed facilitators to prompt use of life skill (action goals) where appropriate
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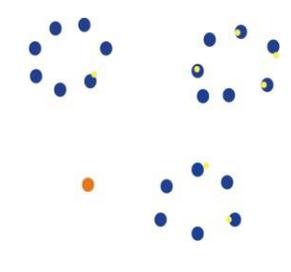
- Try to add in overlaps/underlaps between players, i.e. moving in directions other than just straight lines.
- Add in static defenders who can intercept.
- Add in moving defenders who can intercept the ball.

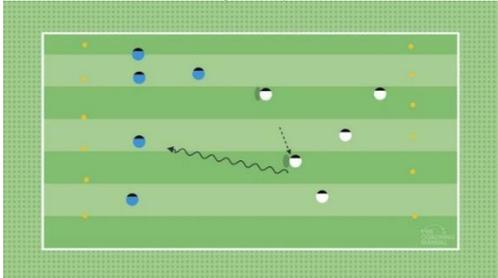


Contingency activity:
“Catch this”

As with basketball activity, players are each numbered from 1 to n within small groups (e.g., 4-6 players). Players start by passing in order (i.e., 1 to 2, 2 to 3, etc.) Players are then instructed to move ball around in a chest pass, bounce pass, and overarm passing techniques.

Progression: Instructions are then called out that all groups follow while still passing. (1) Reverse = reverse the passing order (e.g., 3 to 2, 2 to 1 etc.). (2) Switch= move your ball to the next group clockwise (3) Rotate = move your whole group to change position with another group.

			<p>Add in challenges such as:</p> <ul style="list-style-type: none"> ○ Increase speed. ○ Add in more balls ○ Move as a group while passing the ball. 	
(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.		
PLAY	30 min	<ul style="list-style-type: none"> • skill execution/demonstration • teamwork/social interaction 	<p>Constraints based approach to tag rugby game</p> <p>Set up (see diagram):</p> <ul style="list-style-type: none"> • A pitch is marked out with four boxes in each corner • Two even teams are created. <p>Rules:</p> <ul style="list-style-type: none"> • Each team tries to score by running over end line with the ball (Not diving touchdown) • Constraints (Progressed in order to allow the game to progress from simple to more complex rules) 	<ul style="list-style-type: none"> • delivered by 1 facilitator; 2 to participate or interact with those on the sideline • be aware of bib sizing when determining teams • be aware of skill level when assigning teams (strongest players on opposite teams) • add water breaks throughout if needed • facilitators to prompt use of life skill (motivation) where appropriate

			<ol style="list-style-type: none"> 1. Rugby netball. Players cannot move with the ball and can only intercept to win possession. 2. Players get three steps when they have ball in hands. 3. Players can move freely with the ball but must pass (free pass) to teammate if they are tagged by opposition. 4. Pass they make following being tagged must now move backwards only. 5. All passes must now move backwards. (Normal tag rugby rules) 	<ul style="list-style-type: none"> • facilitators to explain where/how to “tag”; reinforce that it is tag and not contact
COOL DOWN/ DEBRIEF	15 min	<ul style="list-style-type: none"> • lower heart rate • catch breath • promote habit of reflection 	<p>Cooldown</p> <ul style="list-style-type: none"> • Walk with someone- share favourite part of session • Hamstring stretch- “grass grazers” • Glute stretch- figure 4 or foot to bum • Reach arms up (deep breath in)/ reach to toes/knees/shins (breath out) x 3 <p>Debrief</p> <ul style="list-style-type: none"> • confidence meter: 1: touch rugby; 2: ability to give it a go next week (prompt comparison to beginning of session) 	Collect watches and HR monitors, record steps, distribute vouchers

			<ul style="list-style-type: none"> • check in with goal... was it realistic? Too hard? too easy? what helped you accomplish it? What would help you accomplish next week? • Discussion/workbooks <ul style="list-style-type: none"> ○ have participants apply action goal concepts to other goals they are currently working on (one thing that you can do today, tomorrow, or next week?; how, why?) ○ Encourage writing in notebooks and sharing with person next to them and/or group 	
SOCIAL TIME/ SNACKS	20 min	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily 	light snacks (i.e., wraps, sandwiches, fruit) and water/electrolytes available	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily
FACILITATOR REFLECTION	30 min (post session)	(same as session 1)	(same as session 1)	(same as session 1)

Session 4: Touch Rugby (outdoor)

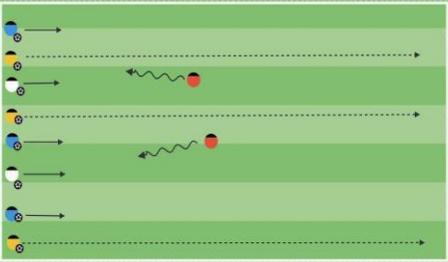
Key Outcomes: 1) Building rapport/building trust; 2) Social interaction; 3) Skill development / confidence; 4) Increased physical activity; 5) Mental skills training: breath control; 6) cater to individuals (e.g., injury, personal goals)

Materials needed: rugby balls (10-20), cones (30), bibs (20), first aid kit, alternative activities (e.g., ring toss, skittles, beach bats), water, snacks

Note: Facilitators are to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities

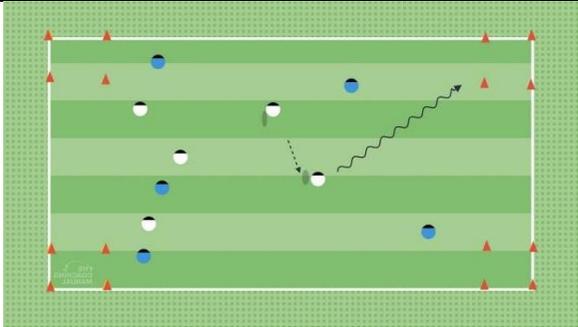
PHASE	TIMING	KEY COMPONENTS TO TARGET	ACTIVITIES	KEY TEACHING/ FACILITATING POINTS
INTRODUCTION/ ICE BREAKER(S)	20 min	Build rapport and familiarity, foster social interaction, introduce life skills component	<p>Arrival Activity: skittles, beach bats, ring toss etc.; music</p> <p>Acknowledgement of Country: same as session 1</p> <p>Welcome: introductions, housekeeping reminder; recap expectations (while adding in basic stretches- calf raises; leg swings; lunges)</p> <p>Ice breaker: find a partner and share an action goal incorporated into your week last week, or one that you can incorporate this week</p> <p>Life skills</p> <ul style="list-style-type: none"> • breathing activity: “circle breath” <ul style="list-style-type: none"> ○ Complete breath- slow and controlled ○ Start with one hand on stomach and one hand on chest ○ Think about lungs expanding from bottom/diaphragm ○ Inhale through nose, out through mouth, pausing between 	<ul style="list-style-type: none"> • Engage participants in casual conversation upon arrival • Give participants watches and HR monitors and as they arrive (optional) • Encourage participants to engage in arrival activity (beach bats, ring toss, etc.) • Run by 1 facilitator, others participate

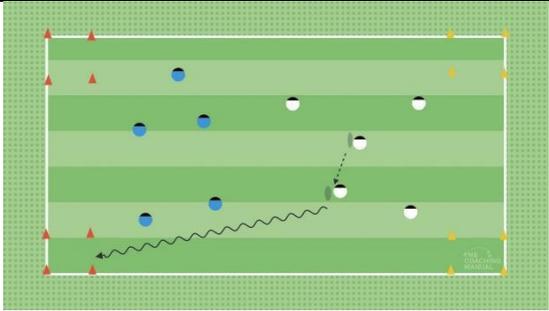
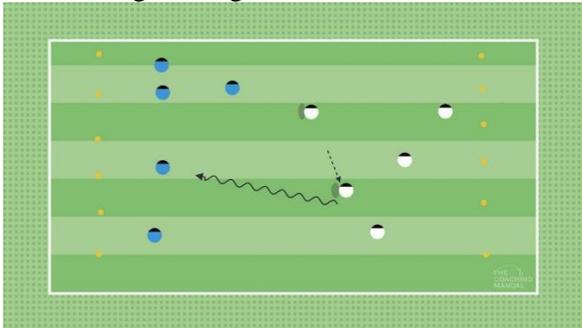
			<ul style="list-style-type: none"> ○ Exhale should be longer than the inhale (ie in for 4, out for 5- modify for each individual) ● Have participants repeat exercise; have those using a HR monitor note their HR before and after exercise, and to note resting HR mentally or in workbook ● Discuss the importance of breath control in sport 	
PHYSICAL WARMUP	10 min	<ul style="list-style-type: none"> ● elevated heart rate ● movement in major muscle groups ● social interaction/familiarity priming for physical skills required for day (e.g., hand-eye coordination, reflexes, spatial awareness) 	<p>Dynamic movement: Naughts and crosses</p> <ul style="list-style-type: none"> ● Create large 3x3 grid with cone ● Teams compete to get 3 bibs (each team has a different colour) in a row. ● Teams compete simultaneously (not turn by turn) ● Players on each team take turns running the bib; must return to team tag next player relay style before they run the bib ● Adaptations <ul style="list-style-type: none"> ○ To make easier/encourage leadership, Add in guidance player at the end of the box to help. ○ Challenge: can remove other team's bib instead of adding your own <p>Tag Game: mice tails</p> <ul style="list-style-type: none"> ● Players run from end to end without getting their bibs removed by taggers in the middle. ● Players must hold a ball each ● If tagged (bib removed) they become a tagger in the middle. 	<ul style="list-style-type: none"> ● Run by 1 facilitator, others participate or engage with those on the sideline ● facilitators to explain why (in relation to rugby) during explanation (e.g., physical mobility, warming up major muscle groups, injury prevention, spatial awareness, reflexes, etc ● Prompt use of circle breathing where appropriate

			<ul style="list-style-type: none"> Last one crossing is the winner. 	
(BREAK)	5 min	<p>To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.</p> <p>Note: prompt use of circle breathing during breaks, and have participants take note of HR monitor before and after break/breath work</p>		
SKILL LEARNING	20 min	<p>comfort with rugby ball, rugby rules familiarity, passing, spatial awareness</p>	<p>Confidence meter: 1: touch rugby; 2: ability to give it a go (compare to last week)</p> <p>‘Retrieve the ball’ Set up:</p> <ul style="list-style-type: none"> Two teams of approx. 6-8 members pass three balls around within a predefined area (see diagram 1). The three balls each have a different sign marked on them O, X, ▲. <p>Stage 1</p> <ul style="list-style-type: none"> When the coach calls the sign the teams must work out where this ball is and pass to the coach before the other team. <ul style="list-style-type: none"> Stage 2 	<ul style="list-style-type: none"> facilitators to create/seek opportunities to foster individual needs (e.g., catering to injury; providing opportunity for leadership) 2 facilitators to deliver, 1 to participate or engage with those on the sideline facilitators to encourage reciprocal learning and increased challenges in skill development add water break in middle if needed

			<ul style="list-style-type: none"> ○ A defender is added to each box from the opposite team. ○ On the call of a certain sign, the defender aims to retrieve the by tagging players in possession of it. On tagging the player they inspect the ball. If they get the incorrect ball they must pass this back to the team (remembering where it was) and try again to regain correct ball. Whichever defender retrieves the correct ball first wins a point for their team. ● Stage 3 <ul style="list-style-type: none"> ○ The coach now calls all three signs in a specific order. ○ The defender must now retrieve all three balls in the correct order in the same manner of tagging players. e.g., X then ▲ then O. ○ Again, the defender that retrieves the balls fastest wins one point for their team. ○ The game is over either after a predetermined period of time or certain score is attained. 	<ul style="list-style-type: none"> ● facilitators to prompt use of life skill (circle breath) where appropriate
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(BREAK)	5 min	<p>To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.</p> <p>Note: prompt use of circle breathing during breaks, and have participants take note of HR monitor before and after break/breath work</p>		
PLAY	30 min	<ul style="list-style-type: none"> • skill execution/demonstration • teamwork/social interaction 	<p>4 corner ball Set up (see diagram):</p> <ul style="list-style-type: none"> • A pitch is marked out with four boxes in each corner • Two even teams are created. <p>Rules:</p> <ul style="list-style-type: none"> • The ball can move in any direction and players can also run with the ball in their hands. • Any team can score in any corner • Once a player is tagged they must stop and pass the ball to a teammate. • After a team has received 3 tags they must turn the ball over to the opposition. • Players can only be tagged when in possession of ball 	<ul style="list-style-type: none"> • delivered by 1 facilitator; 2 to participate or interact with those on the sideline • facilitators to explain where/how to “tag”; reinforce that it is tag and not contact • facilitators to determine result of dropped ball or missed pass depending on skill levels (e.g., play on, or turnover) • facilitators to remind how/where to tag • be aware of bib sizing when determining teams

			 <p>Progression</p> <ul style="list-style-type: none"> • Players can only score by receiving a pass in one of the four boxes (scoring team keeps possession; one free pass after scoring or turnover) • Players can only score by receiving a pass in one of the four boxes. However, on scoring that team must switch directions and try to score in other end to confirm the goal • Coaches set specific ends that each team must score (see diagram 2). Player must touch ball on ground to score. Players can run in or be passed to in either or their target boxes. 	<ul style="list-style-type: none"> • be aware of skill level when assigning teams (strongest players on opposite teams) • add water breaks throughout if needed • facilitators to prompt use of life skill (circle breath) where appropriate
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			 <p>Progression rules</p> <ol style="list-style-type: none"> 1. Ball can now only move backwards between teammates. 2. Players attack one end zone replicating a conventional rugby pitch as opposed to original target boxes. 	
<p>COOL DOWN/DEBRIEF</p>	<p>15 min</p>	<ul style="list-style-type: none"> • lower heart rate • catch breath • develop habit of reflection 	<p>Circle breath: prompt use of circle breathing, and have participants take note of HR monitor before and after break/breath work</p> <p>Confidence meter: touch rugby confidence (compare to beginning of session)</p> <p>Cooldown</p>	<ul style="list-style-type: none"> • 1 facilitator to deliver; others to set up food etc. • Collect watches and HR monitors, record steps, distribute vouchers

			<ul style="list-style-type: none"> • Walk with someone- share favourite part of session • Hamstring stretch- “grass grazers” • Glute stretch- figure 4 or foot to bum • Reach arms up (deep breath in)/ reach to toes/knees/shins (breath out) x 3 • breath work paired with HR monitor <p>Debrief</p> <ul style="list-style-type: none"> • Notebooks: reflect on when/where would breath work be helpful • conversation about elevated steps and elevated HR in relation to health • Vote on next week’s sport : ultimate frisbee, soccer, hockey 	
SOCIAL TIME/ SNACKS	20 min	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily 	light snacks (i.e., wraps, sandwiches, fruit) and water/electrolytes available	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily
FACILITATOR REFLECTION	30 min (post session)	(same as session 1)	(same as session 1)	(same as session 1)

Session 5: Hockey

Key outcomes: 1. Building rapport/building trust 2. Social interaction 3. Skill development / confidence 4. Increased physical activity 5. Mental skills training: breath control

Materials Needed: hockey sticks (20), balls (20), cones (30), bibs (20), first aid kit, alternative activities (e.g., ring toss, skittles, beach bats), water, snacks

Note: Facilitators are to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities

PHASE	TIMING	KEY COMPONENTS TO TARGET	ACTIVITIES	KEY TEACHING/ FACILITATING POINTS
INTRODUCTION/ ICE BREAKER(S)	20 min	Build rapport and familiarity, foster social interaction, introduce mental skills component	<p>Arrival Activity: skittles, beach bats, ring toss etc.; music</p> <p>Acknowledgement of Country: same as session 1</p> <p>Welcome: introductions, housekeeping reminder; recap expectations (while adding in basic stretches-calf raises; leg swings; lunges)</p> <p>Ice breaker: paper airplane/questions</p> <ul style="list-style-type: none"> • Provide each person with a piece of paper and a pen • Each person writes 1-2 questions they might want to know about others in the group (e.g., if you could travel anywhere in the world, where would it be and why?) • Each person folds paper into a paper airplane • At the same time, everyone throws paper airplane • Progress by picking up someone else's paper airplane and throwing it (continue for a minute) 	<ul style="list-style-type: none"> • Engage participants in casual conversation upon arrival • Give participants watches and HR monitors and as they arrive (optional) • Encourage participants to engage in arrival activity (beach bats, ring toss, etc.) • Run by 1 facilitator, others participate

			<ul style="list-style-type: none"> When the facilitator calls time, pick up a nearby paper airplane, find a partner, unfold paper airplanes, and ask and answer the questions on the paper with one another <p>Life skills</p> <ul style="list-style-type: none"> breathing activity-review circle breath; begin with pushing all air out and holding to demonstrate effect; add pauses at top and bottom; challenge: extend count from last week notice heart rate before and after practice confidence meter (hockey ability; ability to give it a go) 	
PHYSICAL WARM UP	10 min	<ul style="list-style-type: none"> elevated heart rate movement in major muscle groups social interaction/familiarity priming for physical skills required for day (e.g., hand-eye coordination, reflexes, spatial awareness) 	<p>Dynamic movement: Group bib tag</p> <ul style="list-style-type: none"> start slow to warm up (e.g., walking only) progression - once tagged you go pick up a spare bib, work in teams with a bib provide rest zone area progress with sticks and balls: Catchers aim to throw bib on the balls of the runners. If caught a player is stuck until another runner passes their ball between their legs and releases them. 	<ul style="list-style-type: none"> 2 facilitators to deliver, 1 to participate or engage with those on the sideline facilitators to create/seek opportunities to foster individual needs (e.g., catering to injury; providing opportunity for leadership) facilitators to encourage reciprocal learning and increased challenges in skill development

				<ul style="list-style-type: none"> • add water break in middle if needed • facilitators to prompt use of life skill (circle breath) where appropriate • Use rest zone and constraints to encourage gradual warm up
(BREAK)	5 min	<p>To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.</p> <p>Note: prompt use of circle breathing during breaks, and have participants take note of HR monitor before and after break/breath work</p>		
SKILL LEARNING	20 min	comfort with hockey stick, rules familiarity, passing, spatial awareness,	<p>“Bringing home the bacon”</p> <p>Set up:</p> <ul style="list-style-type: none"> • Two even teams are created with each team being numbered 1 to N (e.g., 1 to 10 if 10 players). • Within this set up each player has a player on the opposite team with the same corresponding number. Player are attempted to be matched on general ability. • A regular hockey pitch is create with both teams lined up along one sideline (see diagram 1) • A hockey ball is placed in the middle of the pitch. <p>Rules</p> <ul style="list-style-type: none"> • When the coach calls a number, the player with that number from each team runs out onto the pitch and attempts to score with the ball left in the middle of the pitch by striking it into the opposing team’s goal 	adjust according to skill level and engagement

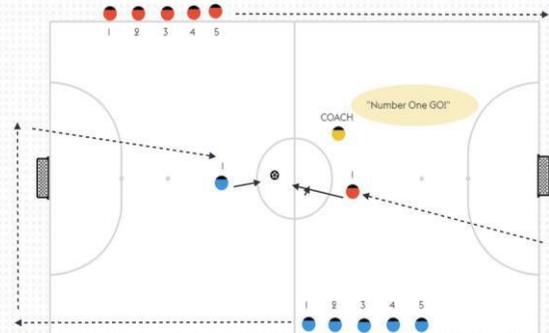
- If a player scores a goal this is added to their team total.
- The game ends after a certain period of time or number of goals.

Progressions

- Coach may call 2 numbers with multiple players working together (e.g., passing, dribbling) to try and score a goal in line with the same rules
- The coach can continue to increase the number of numbers call to enhance the difficult of the task.

Constraint options:

- If obvious differences in ability occur between two players with the same number the following constrains are imposed on the stronger player.
 - Stronger player can walk only
 - One handed hockey sticks
 - Player must balance cone on head while playing.



(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation. Note: prompt use of circle breathing during breaks, and have participants take note of HR monitor before and after break/breath work		
PLAY	30 min	<ul style="list-style-type: none"> • skill execution/demonstration • teamwork/social interaction 	Small sided game with above constraints if needed <ul style="list-style-type: none"> • additional constraints <ul style="list-style-type: none"> ○ safe zone ○ neutral player ○ round robin competition 	
COOL DOWN/DEBRIEF	15 min	<ul style="list-style-type: none"> • lower heart rate • catch breath • foster habit of reflection 	<p>Circle breath: prompt use of circle breathing, and have participants take note of HR monitor before and after break/breath work</p> <p>Confidence meter: touch rugby confidence (compare to beginning of session)</p> <p>Cooldown</p> <ul style="list-style-type: none"> • Walk with someone- share favourite part of session • Hamstring stretch- “grass grazers” • Glute stretch- figure 4 or foot to bum • Reach arms up (deep breath in)/ reach to toes/knees/shins (breath out) x 3 • breath work paired with HR monitor <ul style="list-style-type: none"> ○ Rhythmic breathing: inhale for 4, hold for 4, exhale for 4, pause for 4. <p>Debrief</p> <ul style="list-style-type: none"> • Notebooks: reflect when/where would breath work be helpful 	<ul style="list-style-type: none"> • 1 facilitator to deliver; others to set up food etc. • Collect watches and HR monitors, record steps, distribute vouchers

			<ul style="list-style-type: none"> • Set action goal re: breath work: what, how, why 	
SOCIAL TIME/ SNACKS	20 min	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily 	light snacks (i.e., wraps, sandwiches, fruit) and water/electrolytes available	<ul style="list-style-type: none"> • informal social interaction • rehydrate and refuel healthily
FACILITATOR REFLECTION	30 min (post session)	(same as session 1)	(same as session 1)	(same as session 1)

Session 6: Hockey

Key outcomes: 1. Building team cohesion 2. Social interaction 3. Skill development / confidence 4. Increased physical activity 5. Mental skills training: breath control 6. reflection

Materials Needed: hockey sticks (20), balls (20), cones (30), bibs (20), first aid kit, alternative activities (e.g., ring toss, skittles, beach bats), cardboard pieces for team building (15), water, snacks

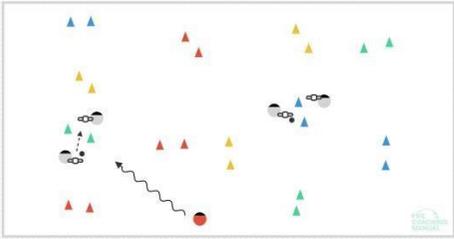
Note: Facilitators are to treat all participants and support workers equally; support workers and facilitators participate alongside young people for all activities

PHASE	TIMING	KEY COMPONENTS TO TARGET	ACTIVITIES	KEY TEACHING/ FACILITATING POINTS
INTRODUCTION/ ICE BREAKER(S)	10 min	Build rapport and familiarity, foster social interaction, introduce life skills component	<p>Arrival Activity: skittles, beach bats, ring toss etc.; music</p> <p>Acknowledgement of Country: same as session 1</p> <p>Welcome: introductions, housekeeping reminder; recap expectations (while adding in basic stretches- calf raises; leg swings; lunges)</p> <p>Life skills</p> <ul style="list-style-type: none"> • Acknowledge last session. • Remind participants of “finding their why”- what brought you here today? What is one thing you want to get out of this session? (Action goal related to this: what, how, why) 	<ul style="list-style-type: none"> • Run by 1 facilitator, others participate • Engage participants in casual conversation upon arrival • Give participants watches and HR monitors and as they arrive (optional) • Encourage participants to engage in arrival activity (beach bats, ring toss, etc.)
PHYSICAL WARM UP	20 min	<ul style="list-style-type: none"> • movement in major muscle groups • social interaction/familiarity • team building 	<p>Crocodile river</p> <ul style="list-style-type: none"> • 2 teams trying to get across crocodile infested river 	<ul style="list-style-type: none"> • 1 facilitator to lead, 2 others to moderate • be aware of even mix of participants on teams;

		<ul style="list-style-type: none"> • leadership and decision making opportunities 	<ul style="list-style-type: none"> • Can use “magic stones” (cardboard pieces) that float and keep you safe as long as there is bodily contact on them • As soon as no one is touching magic stones, they disappear • People are only safe on the stones- if a hand or foot touches the river, it will get bitten off and they must proceed without using it • If someone ends up in the river with no part of them on the stone, the whole team has to start over • Play <ul style="list-style-type: none"> ○ one stone for each person on the team ○ river as wide as 1.5 meters x people on team ○ teams cross in opposite directions ○ give 2-3 minutes to strategise/practise before starting ○ goal is to be the first team with all members safely across ○ Challenge: add 1 cone per team as “oxygen mask” that everyone must breath into once every minute to stay alive <p>Zip tag (If time allows and/or not liking problem solving)</p> <p>Set up:</p> <ul style="list-style-type: none"> • Players all start in the box with. • Taggers tag by brushing the back of runners with their hand (i.e., pulling down an imaginary zip on runners backs) 	<p>encourage opportunities to lead</p>
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			<ul style="list-style-type: none"> • If a player is tagged they must crouch down until they are 'zipped' back up by someone brushing their hand up on their back. • The game is over when there are no more runners remaining or after a predestined period of time. <p style="text-align: center;">Stage 1:</p> <ul style="list-style-type: none"> • Three taggers are placed in the box. • Everyone else is a runner. • Any runner can zip a caught person back up and bring them back into the game. <p style="text-align: center;">Stage 2:</p> <ul style="list-style-type: none"> • Three medics are added to the game, keeping the three taggers. • In this stage, only medics can zip players back up making it harder to keep runners in the game. • Note. Medics cannot be unzipped at this point. <p style="text-align: center;">Stage 3:</p> <ul style="list-style-type: none"> • Players are grouped and bibbed in four equal teams • In this version players can tag players from any of the other three teams. • However, only your teammates can re-zip you and bring you back into the game if you are caught. • Once your team is all zipped your team is out of the game. 	
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(BREAK)	5 min	<p>To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.</p> <p>Note: prompt use of circle breathing during breaks, and have participants take note of HR monitor before and after break/breath work</p>		
SKILL LEARNING	20 min	<p>Build comfort with sticks and balls, hockey rules familiarity, passing, tackling, spatial awareness</p>	<p>Guardians of the Galaxy</p> <p>Set up:</p> <ul style="list-style-type: none"> • A box is created with 4 different colour gates (two cones of the same colour) placed at different points within. • At least 3 sets of each colour gates are needed • Players are then put in pairs each with a stick and one ball between them <p>Rules</p> <ul style="list-style-type: none"> • The aim for the players is to pass the balls between as many gates as possible. • Players take turn to dribble the ball in between passing through each set of gates. • Player can't pass through the same colour twice in a row • The aim for pairs is to try to pass through as many as gates as possible in a set period of time. <p>Progressions:</p> <ul style="list-style-type: none"> • Defenders are added in the box to try and tack the players dribbling and knock their ball out of the box. • If their ball leaves the box, a pair's score reverts back to zero. 	<ul style="list-style-type: none"> • 2 facilitators to deliver, 1 to participate or engage with those on the sideline • facilitators to create/seek opportunities to foster individual needs (e.g., catering to injury; providing opportunity for leadership) • facilitators to take note of any adaptations needed/utilised • facilitators to encourage reciprocal learning and increased challenges in skill development • add water break in middle if needed • facilitators to seek opportunities to embed life skills training throughout

			 <p>Risky business</p> <p>Set up</p> <ul style="list-style-type: none">• Two teams are created each with an even number of players.• Each team takes turn as the attacking team. <p>Rules</p> <ul style="list-style-type: none">• As the attacking team, each individual in turn gets to choose a challenge for their team to score a certain amount of points.• Points are only attained if their team scores and the number of points give is progressive in line with the difficulty (see ‘options’ below).	
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			<ul style="list-style-type: none"> Once the player chooses the challenge the <div> </div> <p>coach plays the ball in and the players attempt to score past their defending opposition.</p> <ul style="list-style-type: none"> Once every player has chosen a challenge the other turn become the attackers and attempt to beat the opposition's overall score to win the game. Each team gets two attempts as the attacking team before scores are totalled and the winner determined. Point Options <ul style="list-style-type: none"> 5 Points = 1 attacker v 2 defenders 4 Points = 1v1 3 Points = 3v2 2 Points = 2v1 1 Point = 3v1 	
(BREAK)	5 min	To allow participants to catch their breath, get a drink or a snack, and engage in informal social interaction. Facilitators are to engage participants in casual conversation.		

		Note: prompt use of circle breathing during breaks, and have participants take note of HR monitor before and after break/breath work		
PLAY	30 min	<ul style="list-style-type: none"> • skill execution/demonstration • teamwork/social interaction 	<p>Small sided game with constraints if needed</p> <ul style="list-style-type: none"> • constraint options: <ul style="list-style-type: none"> ○ walking only ○ one handed hockey sticks ○ keep cone on head ○ additional constraints <ul style="list-style-type: none"> - safe zone - neutral player - round robin competition <p>Wrap activity</p> <ul style="list-style-type: none"> • Penalty shootout 	<ul style="list-style-type: none"> • facilitators to create/seek opportunities to foster individual needs (e.g., catering to injury; providing opportunity for leadership) • facilitators to take note of any adaptations needed/utilised • facilitators to seek opportunities to embed life skills training throughout
COOL DOWN/DEBRIEF	20 min	<ul style="list-style-type: none"> • lower heart rate • catch breath • foster habit of reflection 	<p>Cool down</p> <ul style="list-style-type: none"> • Walk with someone- share favourite part of program • Hamstring stretch- “grass grazers” • Glute stretch- figure 4 or foot to bum • Reach arms up (deep breath in)/ reach to toes/knees/shins (breath out) x 3 <p>Debrief</p> <ul style="list-style-type: none"> • think back to first week: confidence in ability to participate in program vs. today • Reflection in workbooks: <ul style="list-style-type: none"> ○ What challenges did you overcome? ○ What are you most proud of? ○ What motivated you to attend? ○ How did you ask for/receive/give support? 	

			<ul style="list-style-type: none"> ○ What will you take forward from here? (set action goal) ● Visualise transfer <ul style="list-style-type: none"> ○ Hand out multi coloured post-it notes ○ Have everyone answer: What will you take from this program to other parts of your life? (can write on multiple post-its) ○ Instruct (and facilitators model) sticking post-its to board 	
SOCIAL TIME/ SNACKS	20 min	<ul style="list-style-type: none"> ● informal social interaction ● rehydrate and refuel healthily 	light snacks (i.e., wraps, sandwiches, fruit) and water/electrolytes available	
FACILITATOR REFLECTION	30 min (post session)	(same as session 1)	(same as session 1)	(same as session 1)

Chapter 6: General Discussion

This PhD thesis chronicles the exploration, development, implementation, and evaluation of a sport-based life skills program for young people recovering from first episode psychosis (FEP). It combines seemingly disparate literature from the fields of sport-based life skill development and FEP recovery to highlight sport as a novel and much needed recovery avenue. The aims of this PhD thesis were accomplished in four phases, as documented in the previous chapters and reviewed below.

6.1. Process and Outcomes

First came the exploration phase, in which I conducted a narrative review to address the question: Should sport-based life skills interventions be developed for young people recovering from first episode psychosis? A narrative was developed through a broad, critical review of literatures on (i) first episode psychosis recovery (FEP); and (ii) life skills and sport, highlighting the conceptual (and limited empirical) links between the two. This style of review allowed for a critical examination of evidence from seemingly distinct literatures to address a question yet to be explored empirically. The review process highlighted important overlaps between psychosis recovery and sport. A review of the FEP recovery literature revealed that important components of an individual's recovery following a psychotic episode are: 1) physical activity, 2) opportunities to build life skills, and 3) social connectivity. A review of the sport and life skills literature suggested that sport can be a powerful platform from which to: 1) promote physical activity, 2) teach life skills, and 3) foster social connectivity within vulnerable populations. Despite the clear links between the two fields, mental health interventions that combine both life skills training components and physical activity in a context that promotes social connectivity are scarce to none. The results suggested that sport-based interventions could be an opportunity to provide life skills training, social connectivity, and physical activity opportunities in one intervention to individuals recovering from their first psychotic episode. As such, in this chapter I called for their development and provided empirically-based recommendations for intervention design.

In the second phase, I built on the call to action highlighted in the narrative review by conducting a qualitative study explore the barriers and enablers to sport participation for young people with FEP. I used a semi-structured interview format to conduct 1-1 interviews with young people (aged 16-25 years; n=10) with FEP, and 1-

1 interviews and focus groups with their clinicians (n=33). Questions focused on barriers and facilitators (intrapersonal, interpersonal, psychological, environment, health/safety, logistical) to sport participation in young people with FEP. Thematic analysis was used to analyse the data. Four themes (and eleven sub-themes) were developed from the analysis: 1) the need for sport in FEP recovery (perceived benefits; resource gap); 2) barriers (logistical; psychological); 3) enablers (positive environmental expectations and experiences); and 4) program design (sport program/type; life skills training; application to barriers/enablers). The participants responded favourably to the idea of using sport to promote recovery post-FEP, and provided insight into why sport is currently underutilised within FEP recovery efforts. The barriers, enablers, and specific suggestions for how to limit the barriers and strengthen the enablers provided a valuable starting point sport-based intervention design within FEP.

The first two phases formed the foundation of the third phase, in which I used an intervention mapping approach (Bartholomew Eldredge et al., 2016) to systematically develop a sport-based life skills intervention for young people recovering from FEP. The process began with a needs assessment to understand the problem, in which the narrative review and qualitative study from phases one and two were critical. I then conducted an analysis of the outcomes and objectives needed for change, and highlighted specific evidence-based change methods that could inform relevant practical application strategies. This systematic process culminated in an evidence-based framework for a feasibility and pilot study.

In the fourth and final phase I delivered and evaluated a feasibility and pilot study of a sport-based life skills intervention for young people with FEP in partnership with a local early psychosis functional recovery service provider. The primary aims were to assess the feasibility and acceptability of utilising sport-based life skills within FEP recovery effort and test intervention components. The secondary aim was to evaluate the potential recovery benefits. Seven young people (aged 15-25 years) with FEP participated in a six-week sport program alongside their support workers from the service. The program consisted of various sporting activities, which were designed to promote physical activity, maximise social connectivity, and teach life-skills (e.g., motivation, emotional regulation, and goal-setting) that are relevant and transferrable to other contexts (e.g., school, employment, independent living). The support participants (that is, the young

people's community and peer workers) engaged with the program at the same level as the young people, with the role of providing support and normalising/modelling engagement. The young and support participants provided feedback during and after the program via questionnaires and interviews. Quantitative measurements were offered to the young participants pre- and post- intervention. We used thematic analysis (Braun, Clarke, & Weate, 2016) to analyse the qualitative data, and compared this information with other data collected (e.g., attendance, feedback, quantitative measurements). We conducted a process evaluation using Moore and colleagues' (2015) MRC guidance for process evaluation and Bowen and colleagues' (2009) framework for feasibility studies. The results indicated that, despite challenges with engagement for young people with FEP, sport-based life skills programming may be a useful and feasible recovery outlet. In addition, the results highlighted specific intervention components that were useful to promote engagement and recovery benefits. This study serves as a critical foundation for future sport-based work within FEP recovery.

6.2. Significance and Strengths

This PhD contributes to scientific knowledge by combining established literature bases (i.e., sport-based life skills development, FEP functional recovery, intervention mapping) to create a foundation for an innovative recovery platform for young people with FEP. This contribution is important considering the documented need for dynamic, engaging, and early interventions for positive functional recovery outcomes in FEP (see McGorry & Goldstone, 2016; Crlenjak et al., 2015). This series of papers responds to this need in three distinctly novel ways. First, they are the first to explore and design a *sport-based intervention* specifically for a FEP population. Thus far, researchers have focused on promoting physical activity within FEP populations through exercise interventions with some occasional sporting options (e.g., see Firth et al., 2016 a,b,c), but without structured and specialised sport delivery. This absence is surprising given the inherent benefits of sport beyond physical activity (e.g., social connection, normalising components), and may be related to the additional challenges to engagement that a sport intervention creates as previously discussed in the qualitative study (e.g., increased social interaction leading to increased social anxiety, previous bad experiences in sport). Second, these papers are the first to apply *sport-based life skills training* components in FEP

research. The narrative review pointed to the clear theoretical link between life skills development and functional recovery improvements in FEP (e.g., motivation, confidence, and emotional regulation), and that sport-based life skills training has been successfully implemented within vulnerable populations (e.g., Hermens, Super, Verkooijen, & Koelen, 2017). The papers in this PhD are the first to apply these principles to a FEP population, and affirm the question posed in the narrative review - "Is sport an untapped resource in FEP recovery?". Lastly, this PhD is the first to utilise an intervention mapping approach within FEP research. Intervention mapping (Bartholomew Eldredge et al., 2016) is a well-established and highly utilised process within health-related intervention design in other areas (e.g., disease prevention, Garba & Gadanya, 2017; cancer treatment, Lamort-Bouché et al., 2018). It has limited, although promising, application within mental health promotion (e.g., van Oostrom et al., 2007; Wheeler, Fowler, Hattingh, 2013), yet scholars have yet to capitalise on its use within FEP research and intervention development. The use of intervention mapping within this PhD is applicable to mental health research beyond sport and/or FEP. In all, these novel contributions to the literature base provide starting points for new research and clinical avenues within FEP recovery, and add depth to the sport-based life skills and intervention mapping literature bases.

The strengths of this PhD lie largely in the utility of an innovative approach to address an urgent problem. The approach is novel in ideology as discussed above, and also in application. Innovative components included the use of co-design elements (e.g., involving young people in the design process through interviews), participatory action research elements (e.g., seeking feedback from young people during the intervention and making changes accordingly over the course of the intervention), support workers as participants (including those with a lived experience of psychosis), and normalising elements (e.g., food, informal social interaction time). Other strengths include perseverance despite the challenges of working with this population (e.g., engagement), and the successful use of collaboration (e.g., alliance between university, early psychosis service provider, and clients).

6.3. Limitations

This PhD thesis is not without limitation. The novelty of the approach is a strength, but it also led to a broad and cautious approach in an effort to test various

intervention components while also meeting the needs of the population. For example, elements of co-design and life skills training were included at a relatively shallow level. This enabled testing of feasibility (e.g., acceptability), but made it challenging to assess their impact on recovery. Limited resources resulted in short intervention duration, and reliance on the service partner for practical issues such as recruitment, transportation. In addition, partnering with a new service in phase four heightened challenges in recruitment and retention. This made it difficult to assess the feasibility of using sport (e.g., vs. exercise), especially considering that other researchers have not reported the same engagement challenges in exercise specific interventions within FEP (e.g., Firth et al., 2016a). The question still remains - were the engagement challenges reported in phase four due to sport itself (e.g., enhanced anxiety resulting from the social and/or competitive nature of sport, previous bad experiences), or other factors such as the partnering with a new service (e.g., limited rapport between support workers and clients, low client numbers)? In addition, the intervention mapping process was time consuming, and may be impractical within the parameters of some research projects. On this note, these limitations speak in part to the strength of this PhD thesis. The structure and time allowed in a PhD endeavour enabled the exploration of this novel approach which may not be afforded within the general research or practice constraints. It is also important to note that this research was conducted in Perth, Western Australia, and therefore may have limited applicability to other cultures or geographic regions. Lastly, it should be considered that I came into this research program looking to utilise sport for mental health promotion. As such, there may be inherent bias in my conviction that sport is an ideal avenue for recovery within FEP. I was aware of this throughout the research program, and took measures to avoid the “sport evangelist” mindset, that is, the tendency to “blindly believe that sport participation inevitably contributes to youth development because sport’s assumed essential goodness and purity is passed on to those who partake in it” (Coakley, 2011, p. 306). Such measures included engaging in rigorous systematic processes (e.g., intervention mapping), and discussing this bias with my supervisors and service partners throughout, but it is likely that unavoidable bias remains. In all, despite these limitations, the foundation of knowledge created in this PhD is ripe with opportunities to be built upon.

6.4. Future Directions

Throughout this PhD thesis, the results were often presented as “starting points” for future research and practice. The logical next step is to explore how these starting points can be extended in future work. I implore researchers and practitioners to add depth to their FEP recovery efforts by considering how sport, sport-based life skills training, and/or intervention mapping could add value to their clients’/participants’ recovery journeys. There are various opportunities for expansion on the research in this PhD. The MRC’s recommendation to pilot any uncertain intervention components before implementing a large-scale intervention applies here (Moore et al., 2015). Although the results of this PhD suggest that sport-based programming may be useful and feasible for young people recovering from FEP, they also raise many questions that prompt further exploration. Future research could include piloting similar versions of the intervention that address some of the highlighted challenges or limitations identified here. For example, valuable knowledge could be gained from running a similar intervention in conjunction with a more established service, in a different geographical region, within a different culture, with different sports/activities, and/or for a longer time frame. In these various circumstances, the intervention mapping process would be helpful to cater the design to the needs of the specific population.

Throughout the PhD, the intervention mapping process highlighted critical intervention components relevant to the specific target population’s needs and resources (e.g., co-design and participatory action elements, peer support workers as participants, and food to encourage casual social interaction). Given the positive reaction to these elements, it would be beneficial for future research to explore these components more thoroughly. For example, although elements of co-design and participatory research were included, these efforts were done at a relatively shallow level, and future work could explore this approach more deeply (see Nakarada-Kordic et al., 2017; Baum, MacDougall, & Smith, 2006). In addition, the intervention included subtle elements of sport-based life skills training as suggested in the needs assessment (via interviews and focus groups). This allowed for the acceptability of sport-based life skills training to be assessed. Positive levels of acceptability indicate that future work should pilot the inclusion of life skills training elements in a more overt way, which would enable a greater degree of development and transfer (see Pierce, Gould, & Camire, 2017). Overall, the results of this PhD

form a valuable platform from which to assess the feasibility of similar interventions, and to further test specific intervention components.

6.5. Conclusion

This PhD thesis suggests that sport - made up of physical activity, structure, and rules, ripe with learning opportunities, and rich with humanising and normalising components - may be just what the doctor ordered when it comes to FEP recovery. Through chronicling the exploration, development, implementation, and evaluation of a sport-based life skills program for young people recovering from FEP, this PhD highlights sport as an untapped resource for FEP functional recovery efforts, and lays the groundwork for future work in this area. Researchers, practitioners, and policy makers can benefit from the findings reported in this thesis. Researchers can look to utilise this thesis as a foundation for further feasibility and pilot studies that capitalise on the benefits of sport for FEP recovery, or apply some of the mechanisms (e.g., intervention mapping, use of peer support workers as participants) to FEP recovery interventions outside of sport. Practitioners may wish to consider how sport could be utilised within their existing FEP recovery frameworks, paying attention to the specific program design recommendations and components. Policy makers might take note of the challenges reported, such as limited resources (of the mental health services and for the research itself) and red tape within the ethics approval process, to inform their decisions.

This PhD thesis laid the groundwork for the next chapter of my personal journey. At the beginning of this pursuit, it was so clear to me on paper that sport and FEP recovery efforts was a good fit; I simply could not understand the paucity of research and practice in this area. However, as I began to understand the challenges of engaging this population, the limited resources within early intervention services, and the sometimes seemingly insurmountable red tape in the ethics process, I began to get it. Overall, this process has taught me the benefits of being willing to embrace the challenges, the importance of minimising unnecessary red tape, and the value of collaboration. Moments of this PhD pursuit will continually impact me. I will never forget witnessing people come out of their shell throughout the intervention, and seeing glimmers of their personality shining. To see someone go from quietly struggling with a sport skill to fist pumping after an achievement, or to watching awkward silences make way for laughter and banter, are defining experiences for me.

To hear reports from the facilitators, support workers, and participants of forgetting “for even a moment” that this program was about mental health or research, and rather just about a group of people having fun. Sport allowed us all to be in the moment - connecting, laughing, moving our bodies, having fun, and feeling hope in tomorrow.

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Appendix A: Published Article

Published Article (Chapter 2)

Brooke, L. E., Lin, A., Ntoumanis, N., & Gucciardi, D. F. (2019). Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action. *Early Intervention in Psychiatry, 13*, 358-368. doi:10.1111/eip.12720

Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action

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Aim: The objective of this narrative review is to address the question: Should sport-based life skills interventions be developed for young people recovering from first episode psychosis?

Methods: A prose was developed through a broad, critical narrative review of literatures on (1) first episode psychosis recovery (FEP); and (2) life skills and sport, highlighting the conceptual (and limited empirical) links between the two. This style of review allowed for a critical examination of evidence from seemingly distinct literatures to address a question yet to be explored empirically.

Results: The review process highlighted important overlaps between psychosis recovery and sport. A review of the FEP recovery literature reveals that important components of an individual's recovery following a psychotic episode are: (1) physical activity, (2) opportunities to build life skills, and (3) social connectivity. A review of the sport and life skills literature suggests that sport can be a powerful platform from which to: (1) promote physical activity, (2) teach life skills, and (3) foster social connectivity within vulnerable populations. Despite the clear links between the two fields, mental health interventions that combine both life skills training components and physical activity in a context that promotes social connectivity are scarce to none.

Conclusions: We suggest that sport-based interventions could be an opportunity to provide life skills training, social connectivity and physical activity opportunities in one intervention to individuals recovering from their first psychotic episode. We call for their development, and provide empirically-based recommendations for intervention design.

KEY WORDS

early intervention, first episode psychosis, functional recovery, life skills, sport

1 | INTRODUCTION

Targeting intervention to people at their first episode of psychotic illness has been shown to reduce functional (social and occupational) impairment later in life (McGorry, Killackey, & Yung, 2008). Over the past two decades, clinical services have emphasized early intervention, and evidence suggests that this shift coincides with improved remission rates (Lally et al., 2017). As well as the management of psychotic symptoms and co-morbid psychopathology, early intervention in psychosis includes practices that enable functional recovery. Functional recovery goals are supported in various ways, including integral efforts to: (1) increase physical activity (eg, Firth, Cotter, Elliott, French, & Yung, 2015), (2) build life skills (eg, Lemos-Giraldez et al., 2015), and (3) promote social connectedness (eg, Alvarez-Jimenez

et al., 2013). To date, the majority of intervention work has targeted only one or two of these elements directly. As such, there is a need for an approach in which physical activity, life skills and social connectivity are targeted in a coherent and integrative fashion. The overarching objective of this article is to present sport as an ideal context to assimilate the three.

For the purposes of this paper, it is important to clearly define and distinguish physical activity, sport and exercise. The three concepts are closely related, yet there are important differences that are relevant in the context of this review. Physical activity has been defined as "any bodily movement produced by skeletal muscles that requires energy expenditure" (WHO, 2017), whereas exercise is "a subset of physical activity that is planned, structured, and repetitive, and has as a final or intermediate objective of the improvement of

physical fitness” (AUSGovernment, 2011, p.7). Sport is also a subset of physical activity. Although it bears resemblance to exercise and some people may use sport to meet exercise requirements, not all exercise is sport. Sport is a broad concept that has been defined in various ways, but always containing elements of physical activity, organisation, rules, and competition. For example, the AUSGovernment (2011) defines sport as a type of physical activity “involving physical exertion and skill as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations” (p. 7). As we will discuss, it is through these embedded structures within sport that enable it to be a platform for engagement in physical activity, social connectivity and life skills training. In this context, life skills are best defined as cognitive, emotional and behavioural skills learned in one context (eg, sport) that are transferred to and used effectively in other contexts (eg, education; Gould & Carson, 2008).

In this paper, we first provide a review of each physical activity, life skills, and social connectivity in regards to psychosis recovery in

an aim to outline the relevant background information and to support our later call to action. We then connect sport to each of the three tenets to illustrate the opportunity that sport presents as a tool for functional recovery efforts in first episode psychosis (FEP). We conclude with a call to action for the research and development of sport-based life skills interventions for FEP, and offer empirically-based recommendations. Figure 1 illustrates the underpinnings of the argument presented.

2 | RATIONALE FOR AND OVERVIEW OF METHODOLOGICAL APPROACH

The research question evolved organically through discussions pertaining to combined areas of expertise (sport and exercise psychology, health psychology, youth mental health/FEP). Sport was identified as a context and medium through which to teach life skills, which led to the research question about the potential utility of sport engagement

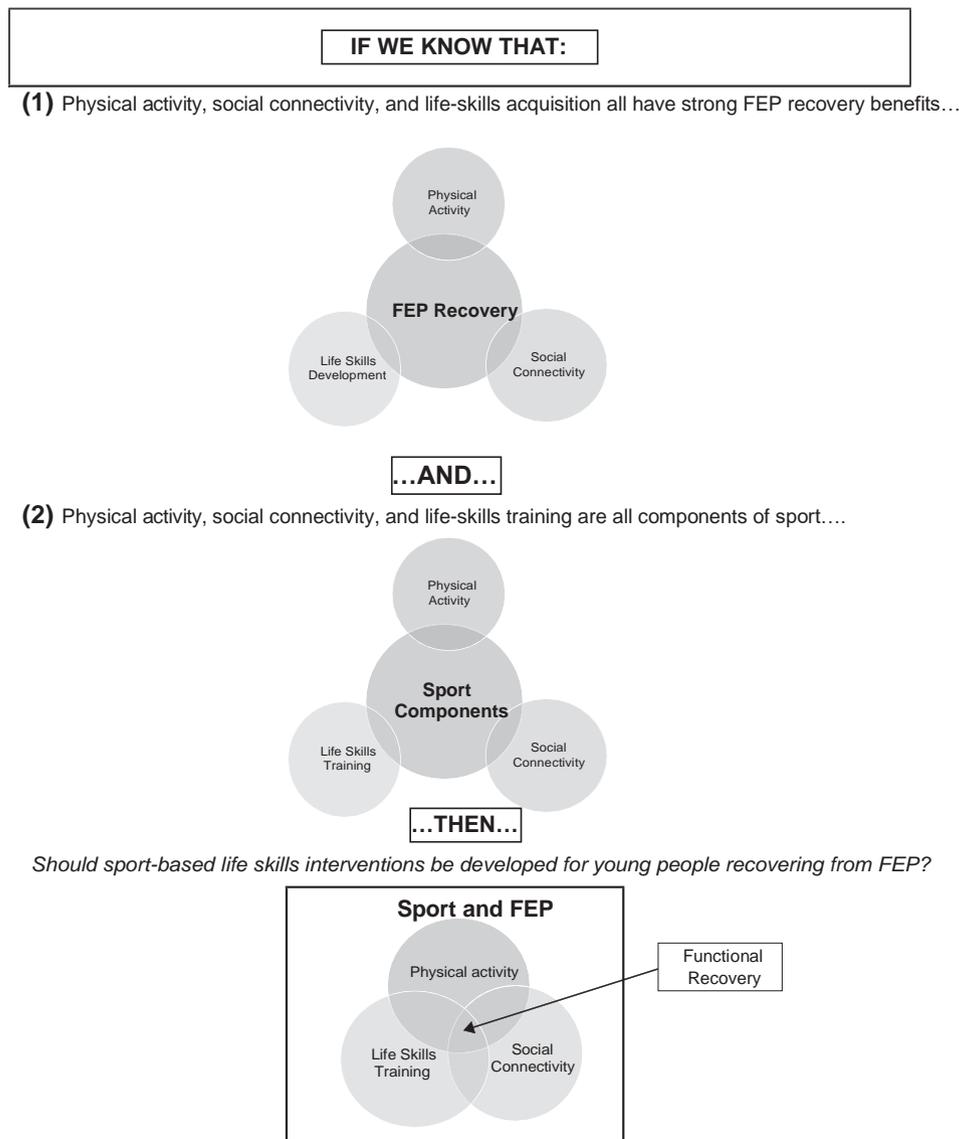


FIGURE 1 Sport-based life skills interventions should be used in first episode psychosis (FEP) recovery. This figure illustrates the underpinnings of the argument presented in the narrative review

TABLE 1 Methods: search and analysis process

Phase	Description
Review style	<ul style="list-style-type: none"> · Narrative review with a critical approach. · Goal was to review distinct research areas to assess the question: <i>Should sport-based life skills interventions be developed for young people recovering from first episode psychosis?</i>
Search strategy: <i>approach</i>	<ul style="list-style-type: none"> · Deductive approach: psychosis recovery literature was examined through a sport lens, and the sport and life skills literature was examined through a psychosis recovery lens. This approach has its benefits in that it allows undiscovered connections to be explored, yet has limitations (eg, unsystematic exhaustive search, potential bias in selection and interpretation).
Search strategy: <i>process</i>	<ul style="list-style-type: none"> · Broad search of psychosis recovery literature (focus on recent systematic reviews and meta-analyses/syntheses) using terms such as “psychosis recovery”, “psychosis” and “functional recovery” · Broad search of sport and life skills literature (focus on recent systematic reviews and meta-syntheses), using terms such as “sport” AND “life skills”. · Broad search of general sport components (eg, definition, reach). · Continually and intuitively narrowed search as overlaps emerged, using the basic components of sport (eg, physical activity, group/social dynamics and life skills training) as a foundation for the searches (eg, “physical activity” OR sport OR exercise AND “psychosis recovery”; “social connectivity” AND “psychosis recovery”).
Data management	<ul style="list-style-type: none"> · All papers of interest were uploaded to NVivo 11 to allow them to be coded as read.
Theme identification/drawing conclusions	<ul style="list-style-type: none"> · Using the sources as “data”, the phases of thematic analysis (Braun & Clarke, 2006) were used to manage and deductively analyse sources and minimize bias (ie, familiarize oneself with data, search for themes, review themes, define and name themes, produce the report). · Papers were coded as they were read to help identify overlapping themes. · Initial themes were both broad (eg, psychosis recovery in general, life skills transfer within sport; side-effects of antipsychotic medication) and narrow (eg, physical activity and FEP recovery; sport to break stigma; stigma and FEP recovery) in nature. · Themes that did not support the hypothesis (eg, potential harm of sport, benefits of individual support for FEP and barriers to engagement) were included, and are discussed in intervention design recommendations

to mental health promotion/use with a population who have experienced or are experiencing mental health problems. A preliminary search revealed a paucity of research relating sport-based life skills interventions and mental illness. Upon further discussions and a cursory review of the literature, the notion that sport-based life skills interventions may meet the needs of people recovering from FEP emerged. Feedback was sought from several local FEP clinicians and services in Perth, Australia, who provided support for the need and feasibility of the idea. Subsequently, a narrative review was chosen to determine existing empirical support of the idea. Our approach was informed by previous narrative reviews in which scholars have forwarded a thesis regarding the unrealised potential of certain intervention approaches within the health sector, both within the FEP literature (eg, friends interventions in psychosis; Harrop, Ellett, Brand, & Lobban, 2015) and beyond (eg, bike sharing schemes to promote physical activity; Bauman, Crane, Drayton, & Titze, 2017). Our approach has been considered by some scholars (eg, Grant & Booth, 2009) to be called a critical review, in which a critical lens comparing diverse bodies of work can enable “conceptual innovation” to form a hypothesis, serving as a subsequent “launch pad” for further research (p. 93). A summary of the search and analysis process can be found in Table 1.

A more systematic approach (eg, systematic review, meta-analysis, or meta-syntheses) was deemed an inappropriate option for this paper. The overarching goal of this review was to present an argument for sport's *potential* utility within FEP recovery efforts because sport has not been explored empirically in this population. Instead, we aimed to strike a balance between purposeful selection and systematic coverage of the literature to help us best present a case for this thesis. In other words, we focused on identifying the most significant literature with regard to the aims of our paper, rather than producing a comprehensive search using systematic processes.

3 | PHYSICAL ACTIVITY IS IMPORTANT FOR PSYCHOSIS RECOVERY AND PREVENTION

3.1 | Physical activity is particularly critical for people with severe mental illnesses like psychosis

The protective and therapeutic health benefits (eg, on physical health, cognition, healthy aging) of regular physical activity in the general population are well known. In regards to mental health, recent research has revealed that physical activity may prevent the development of depression (Harvey et al., 2017; Schuch et al., 2018), and well over two decades of research indicates that physical activity is an effective component to the treatment of a variety of mild mental illnesses like depression and anxiety (eg, Biddle & Mutrie, 2007; Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014). It is clear from this body of work that physical activity is an accessible and affordable form of treatment that, in some cases, is as effective as psychotherapy (eg, Paluska & Schwenk, 2000). It can be argued, however, that physical activity's protective health benefits are even more critical for individuals with severe mental illness (SMI). First, individuals with a SMI (ie, schizophrenia, bipolar disorder and major depressive disorder) have an increased risk of chronic physical disease, particularly metabolic syndrome (MetS) (Vancampfort et al., 2015) and subsequent cardiovascular disease (CVD), contributing to a significantly higher risk of developing and dying from CVD compared to that of the general population (Correll et al., 2017). Furthermore, studies indicate that the risk of diabetes for individuals with SMI is double that of the general population (Vancampfort et al., 2016), and, more specifically, that an increased risk of diabetes is present in people with FEP who are not being treated with antipsychotic medication (Pillinger, Beck, Stubbs, & Howes, 2017). The mortality rate for people with SMI is roughly two

to three times higher than that of the general population, with their life expectancy shortened by 13 to 30 years (De Hert et al., 2011).

The effects of SMI on physical health are multi-faceted, but a large contributing factor is the use of antipsychotic medication. This knowledge is concerning given that antipsychotic medications remain first line treatment of psychotic illnesses. The benefits of antipsychotics come at a high cost - high enough that "in any other scenario, the responsible physician's response would be to seek an alternative" (Lancet, 2011, p. 611). The side-effects of antipsychotics are well-documented and include rapid weight gain, lethargy/sedation and increased appetite contributing to the high incidence of cardiometabolic problems and diabetes within FEP populations (eg, Foley & Morley, 2011; Tek et al., 2016). Although there is no difference in these risk factors between the general population and individuals at the onset of psychotic illness (Foley & Morley, 2011), the incidence of metabolic syndrome multiplies by five after only a few years of antipsychotic treatment (De Hert et al., 2011). As such, there has been a stern call for interventions and treatment protocols that counteract the negative effects of using antipsychotic medication in the treatment of psychotic illness, with increased physical activity being a top complementary choice (eg, International Physical Health in Youth (iphYs) Working Group, 2013).

3.2 | Physical activity interventions have been successful with SMI, and, more specifically, FEP populations

Numerous studies have shown that for people with SMI, physical activity can improve cardiorespiratory fitness and/or lower BMI to protect against the deleterious health outcome and accompany the diagnoses (eg, Rosenbaum, Hobson-Powell, Davison, Elliot, & Ward, 2017; Vancampfort et al., 2017), alleviate symptoms of mental illness (eg, Bonsaksen & Lerdal, 2012; Schuch et al., 2016), improve cognitive functioning (eg, Firth et al., 2016), enhance social competence and self-reliance (eg, Soundy et al., 2014), and bolster markers of overall mental health and quality of life (eg, Firth et al., 2015; Rosenbaum et al., 2014; Soundy et al., 2014). Interventions that use sport as a mode of physical activity for people with SMI have reported functional recovery and quality of life benefits such as a sense of achievement, purpose and belonging; positive sense of identity and enhanced confidence; and positive social experiences (eg, Carless & Douglas, 2016; Soundy et al., 2015).

In recent years, there has been a growing amount of promising research on exercise-based early interventions specifically for the treatment and recovery of psychosis. The early stages of psychosis, particularly the time following a FEP, are considered a critical time in which the detrimental trajectory of the psychological and physical effects of psychosis could be altered (Hughes et al., 2014). Researchers have demonstrated that exercise for people with FEP can be successful in limiting antipsychotic induced weight gain (Curtis et al., 2016), and increasing aerobic fitness (Rosenbaum et al., 2015), both strong markers of metabolic syndrome prevention and psychosocial recovery. Alongside the physical health benefits, exercise interventions reduce psychotic symptoms (Firth et al., 2016) and improve cognitive dysfunction (Firth et al., 2015), provide a welcomed

distraction to psychotic symptoms such as hearing voices (Alexandratos, Barnett, & Thomas, 2012), ease the stigma of mental illness through engagement in a normalized activity (Ellis, Crone, Davey, & Grogan, 2007), provide opportunities for interactive social engagement (Carless & Douglas, 2008), offer a sense of purpose and control (Alexandratos et al., 2012), and lead to less use of inpatient mental health services (Korge & Nunan, 2017). Importantly, there is evidence to suggest that physical activity interventions are feasible and may lead to sustained levels of physical activity post intervention (Firth, Carney, French, Elliott, & Yung, 2016), and that cardiorespiratory fitness may protect against future psychosis (Kunutsor, Laukkanen, & Laukkanen, 2018).

The research supports the importance of regular physical activity for the physical and mental health of people with SMI and psychosis. However, despite these findings, people with SMI (Stubbs et al., 2016; Vancampfort et al., 2017) and, more specifically, FEP (Stubbs et al., 2016), report levels of physical activity well under the World Health Organisation recommendations (WHO, 2017), and well below the general population. Furthermore, these groups report significantly higher levels of sedentary behaviour when compared to healthy controls (Stubbs, Williams, Gaughran, & Craig, 2016; Vancampfort, Firth, et al., 2017). Considering that both low levels of physical activity (WHO, 2017) and high levels of sedentary behaviour (eg, Patterson et al., 2018) are independent risk factors of CVD in the general population, the combination only exasperates existing or future cardiometabolic problems in SMI or FEP, and makes proactive health behaviour less likely or possible (Vancampfort, Firth, et al., 2017). As such, it is unsurprising that reported levels of cardiorespiratory fitness in people with SMI are significantly lower than those of healthy controls (Vancampfort, Rosenbaum, et al., 2017). The inherent conundrum is that the increased need for physical activity within this population is coupled with increased barriers to exercise (eg, weight gain makes exercise more critical, but also more daunting; Rubinstein & Breitborde, 2016). These findings highlight the need for continued and evolved physical activity interventions for people with psychotic illness that are both effective and engaging.

3.3 | FEP physical activity interventions are typically one dimensional

Exercise interventions show success in fostering both mental and physical health, but, for the most part, they do so through the one-dimensional focus on *individual* physical exercise. To date, FEP exercise interventions tend to be individually-focused and only provide exercise instruction, perhaps missing ripe opportunities for further functional recovery and social connectivity; both of which are critical components of psychosis recovery and prevention (McGorry & Goldstone, 2016). There are exceptions to this unidimensional focus on physical exercise, however, the impact on functional recovery or social functioning is generally unmeasured, or the additional components are not prominent in the intervention. For example, Curtis et al. (2016) found that an exercise intervention that had additional life skills/lifestyle intervention components (eg, cooking classes and goal-setting) was successful in attenuating antipsychotic weight gain in FEP, although they did not measure other components of recovery.

Firth et al. (2016) included group sport or exercise as an option in an FEP exercise intervention that measured various markers of recovery, but this group element was minimal overall (ie, less than 10% of all recorded sessions).

Given that early psychosis services are reliant on funding that is often scarce, there is a need to explore multi-dimensional group-based physical activity interventions that have the potential to offer “more bang for the buck”. Along the same lines, given that individuals with FEP tend to find it challenging to engage in interventions because of symptoms and other illness-related factors (eg, increased anxiety, decreased motivation, social stigma; Firth et al., 2016; McCarthy-Jones, Marriott, Knowles, Rowse, & Thompson, 2013), there is a need to find ways to maximize the time that they engage with physical activity-focused programmes. One possibility in this regard is to embed life skills training within physical activity interventions, with the acquisition and transfer of life skills as a primary outcome.

3.4 | Life skills are important for psychosis recovery and prevention

3.4.1 | What are life skills?

Broadly speaking, life skills can be defined as “those skills that enable individuals to succeed in the different environments in which they live, such as school, home and in their neighbourhoods. Life skills can be behavioural (communicating effectively) or cognitive (making effective decisions); interpersonal (being assertive) or intrapersonal (setting goals)” (Danish, Forneris, Hodge, & Heke, 2004, p. 40). Life skills training occurs when these skills are learned in one context (eg, sport) and successfully applied in another (eg, education) (Gould & Carson, 2008). Life skills training aims to foster elements that promote positive health, not just target symptoms of ill-health. This focus is in line with the WHO definition of health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2017, para. 1) and mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community” (para. 2). These definitions are strikingly similar to that of functional recovery within FEP.

3.5 | Life skills help the multifaceted psychosis recovery process

It could be argued that life skills acquisition is at the crux of psychosis recovery, and embedded into functional recovery efforts. A core measure of recovery from psychosis is functional recovery, despite recurring symptoms (McGorry & Goldstone, 2016). One is said to have achieved a level of functional recovery post-psychotic episode when they regain the ability to live and function in an independent and meaningful way (Hughes et al., 2014). Functional recovery is fostered through a focus on the subjective and personal markers of recovery (eg, changes in goals, feelings, and values; Morera, Pratt, and Bucci 2017) and opportunities for social, personal, vocational, and educational growth (eg, Hughes et al., 2014; Shepherd, 2016). Someone who has achieved a level of functional recovery will demonstrate

self-management of the illness (eg, noticing and managing triggers; eg, Lemos-Giraldez et al., 2015) and a growth-focused perspective (eg, working toward goals), and will express feelings such as hope, optimism, self-belief, and control (Shepherd, 2016; Morera, Pratt, & Bucci, 2017). Both clinicians (Morera, Pratt, & Bucci, 2017) and patients (Pitt, Kilbride, Nothard, Welford, & Morrison, 2007) have rated targets of functional recovery as more important than symptom remission. Functional recovery is supported through development of the emotional, cognitive, and behavioural skills targeted within life skills training. If we bring our attention back to the definition of life skills training, one could argue that functional recovery and life skills training are essentially different terms for nearly the same concept. This is evidenced, in, for example, Lemos-Giraldez et al.' (2015) recovery measure, the Stages of Recovery Instrument (STORI), which illustrates the notion that psychosis recovery is a process that leads to a satisfying life, rather than a binary (symptoms present or not) biomedical outcome, and includes indices of goal setting, self-awareness, confidence, control, and optimism. In essence, the psychosis recovery literature uses life skills as indicators of functional recovery; such life skills can be trained and transferred to other contexts. This overlap warrants research into psychosis recovery interventions that contain clear components of life skills training, and encourage transfer of these skills to other areas of life. Interventions utilizing physical activity for SMI (eg, Soundy et al., 2014) and, more specifically, FEP (eg, Firth et al., 2016) show encouraging results for the potential for physical activity (including sport) to be used to foster life skills training within this population. However, as previously discussed, much of this work is one-dimensional in that it only utilizes individual exercise, and functional recovery markers tend to be secondary research outcomes to objective markers of primary outcomes like symptomatology and BMI. Sport may be one option to embed life skills training within FEP interventions and promote functional recovery through creating opportunities for social connectedness.

3.6 | Social connectedness is important for psychosis recovery and prevention

3.6.1 | Psychosis and social isolation

Psychosis leads to social isolation and withdrawal for various reasons, including: (1) effects of both positive and negative symptoms, (2) effects of antipsychotic medication, and (3) the stigma surrounding mental illness, and, more specifically, psychotic illness. Firstly, the symptoms of psychosis (eg, paranoia) and co-morbid psychopathology (such as social anxiety) can threaten social relationships and connection (Mancuso, Horan, Kern, & Green, 2011; McCarthy-Jones et al., 2013). Furthermore, negative symptoms are predictors of poor social recovery and functioning (eg, symptoms such as lethargy, avolition and apathy make engaging in social interactions daunting), whereas negative symptoms such as inappropriate emotional responses and impaired attention may make social attempts unsuccessful (Gee et al., 2016; Schlosser et al., 2015). Secondly, the side-effects of antipsychotic medication are profound. Significant weight gain is common, leading to shame and embarrassment that encourages withdrawal from social relationships (McCarthy-Jones et al., 2013; Tek et al., 2016). Finally, the stigma surrounding mental illness cannot be

underestimated. Research indicates that people who experience psychosis are one of the most stigmatized minority groups within society, and that most of the general population hold negative perceptions about people with psychosis (Vass et al., 2015). People with a psychotic illness are more likely to experience ostracism and bullying, which exacerbates the social divide (Harrop et al., 2015). As psychosis normally develops between adolescence and young adulthood—a time where most young people are attempting to establish themselves as an independent adult—such severe social disruptions at this critical age in development are concerning, and extra care must be taken to promote functional recovery (Harrop et al., 2015; McGorry & Goldstone, 2016).

3.6.2 | Psychosis, recovery and social connectedness

Social isolation that accompanies psychosis has detrimental effects on the individual and their recovery trajectory, and prohibits them from experiencing the well-documented benefits of social connectedness. It has been demonstrated that social engagement and social support are critical components of functional recovery following a psychotic episode. A meta-synthesis of qualitative studies exploring the experience of psychosis found that functional recovery comes largely through non-judgmental support of family and friends, connections with others with a shared experience, and restoring severed relationships (McCarthy-Jones et al., 2013). In an examination of the quality and frequency of social interactions during clinical recovery of FEP, researchers found frequency of interactions with friends (but not the quality of such interactions) to be a significant indicator of clinical recovery (Bjornestad et al., 2017). This finding is promising as it suggests that even surface level interactions could aid in recovery, calling for further research that promotes social interaction. This finding echoes a “call to action” made earlier by Harrop et al. (2015) in which they presented a wealth of evidence to support the need for “friends interventions” for young people with psychosis. The need to counteract the tendency toward isolation and the benefits of social connectedness are clear—what is needed are more interventions specifically addressing these needs in people with early psychosis, and sport may be an optimal avenue. Physical activity interventions for SMI show promising effects on social components of recovery, including enhanced social competence (eg, Soundy et al., 2014), and suggest that sport can provide positive relational experiences (Carless & Douglas, 2016) and critical opportunities to give and receive social support (Soundy et al., 2015). More specifically, in regards to FEP, researchers have demonstrated that physical activity can promote psychosocial functioning (eg, Firth, Carney, Elliott, et al., 2016; Firth, Carney, French, et al., 2016; Firth, Carney, Jerome, et al., 2016), yet the use of sport for FEP has been explored in only a limited manner.

3.7 | Sport is an ideal context in which to integrate physical activity, life skills and social connectivity

3.7.1 | Sport characteristics and reach

Sport is far bigger than the sum of its components within society. Major sporting events draw massive following, and participation in organized sport is a societal norm for many cultures across the globe. In 1978, the United Nations (UN) declared access to sport for children

a fundamental right, not a privilege (UN, 2014). The weight of sport's cultural value is profound—sport has been described as a “global language,” and as having the power to transcend social, cultural, and political divides (Conrad & White, 2015). As such, sport has been used as a medium to promote international peace (eg, Georgiadis & Syrigos, 2009), help trauma victims (eg, Ravizza, 2008), support victims of natural disaster (eg, Kunz, 2009), lead human rights moments (eg, Donnelly, 2008), and teach valuable life skills to socially vulnerable youth (eg, Hermens, Super, Verkooijen, & Koelen, 2017). Perhaps Nelson Mandela said it best when he noted, “We can reach far more people through sport than we can through political or educational programmes. In that way, sport is more powerful than politics” (Bailey, 2008, p. 85). The reach of sport is especially important in regards to FEP recovery when the previously discussed stigmatising properties of psychotic illness are considered (eg, Wood, Byrne, Burke, Enache, & Morrison, 2017). Beyond its potential to be a uniting force, sport also offers many health benefits.

3.8 | The health benefits (physical, mental and developmental) of sport are widespread

Sport provides an engaging and accessible environment in which to develop positive habits that contribute to healthy and productive living. A core component of sport is physical activity, the health (physical and mental) benefits of which are immense for mental illness and FEP. Beyond physical activity, the structure (eg, rules routine, discipline, feedback, social camaraderie, positive role models, mentorship) of sport yields a context ripe for developmental benefits. The effects of sport on development have been examined, with particular emphasis on positive youth development. Participation in sport can support the healthy growth of young people, including physical health benefits (eg, healthy weight maintenance, enhanced cardiorespiratory functioning, decreased risk of diabetes and heart disease), psychosocial well-being (eg, leadership development, enhanced self-esteem, enhanced academic performance), mental health benefits (eg, fewer symptoms of depression, less drug use, and less incidence of suicidal behaviour) and physical developmental gains (eg, increased motor skills) in its participants (eg, Agans, Etekal, Erickson, & Lerner, 2016; Holt, 2016; Vella, Swann, Allen, Schweickle, & Magee, 2017). Sport participants acquire a variety of important social, emotional and behavioural life skills (eg, managing emotions, goal setting, and effective communication) that can be transferred and applied to important life contexts, such as independent living and positive community engagement (Gould & Carson, 2008). There is evidence that long-term participation in organized sport can sustain these benefits (Hermens et al., 2017; Holt, 2016). As such, there has been extensive effort into using sport as a framework and intervention context to promote the positive development of youth, in both healthy and vulnerable populations.

3.9 | Sport has been used as a platform to teach life skills to vulnerable populations

We have already presented evidence to support the importance of life skills in FEP recovery, and argued that the goal of functional recovery

in FEP shares essential components with life skills training. Our proposal that sport may be a platform to teach life skills to people with FEP is supported by the existing evidence that demonstrates the sporting environment as a powerful teaching context, and this capacity has been capitalized by using sport to teach life skills to socially vulnerable youth. A recent systematic review of such literature indicates that the utility of this work is broad (Hermens et al., 2017). Multiple populations have been targeted (eg, low-socioeconomic background, delinquent, minority, immigrant), with a variety of intervention approaches (eg, school-based, summer camp, after school), sports, (eg, mixed sport, basketball, swimming, football), and life skills training methods (eg, mentor training, leadership training, social skills instruction, critical thinking sessions) utilized. This work commonly uses interviewing and pre/post-test quantitative methods (rarely including a control group) to assess a variety of targeted emotional life skills (eg, mood improvement, self-worth), cognitive life skills (eg, self-confidence, motivation), and social life skills (eg, communication, conflict resolution). Although there is room for enhanced methodological rigour within this body of research, overall, the existing evidence suggests that sport programmes can be used as a platform to teach life skills to socially vulnerable youth. This preliminary evidence inspires further work, including application to other socially vulnerable populations, such as people with SMI.

3.10 | Sport provides a platform for social connectivity

We previously presented evidence describing the challenges people with FEP face in regards to social isolation, and the need for social interaction for recovery. Sport offers an avenue to meet this need. Social connectivity is a key benefit of participation in organized sport. Sport creates opportunities for social relationships to flourish (eg, through an inbuilt community), has the potential to nurture critical social skills (eg, through role models and communication training) and support the development of one's social identity (eg, through leadership development and belonging to a community; Conrad & White, 2015). Unsurprisingly, therefore, youth sport participants report greater levels of confidence in social settings and greater satisfaction with their social environment, compared to their peers uninvolved in sport (Holt, 2016). The positive effects of sport participation for social connectivity extend beyond the general population. For example, socially vulnerable youth (eg, from low-socio-economic backgrounds) have demonstrated stronger social connections and life skills following a sport-based participation programme (Hermens et al., 2017). Sport programmes for individuals with SMI have been shown to help provide a positive sense of identity and purpose, increased social confidence, and an enjoyable social experience to look forward to (Soundy et al., 2015). With sport participation comes the opportunity to engage in a normalized activity, which can help ameliorate the negative stigma of mental illness that is so crippling to relationships (Conrad & White, 2015; Soundy et al., 2015). For these reasons, sport represents an ideal context in which to foster and sustain a sense of social connection with others.

3.11 | Call to action and development recommendations for sport based life skills intervention to support FEP recovery

3.11.1 | Call to action

Thus far, we have discussed the benefits of physical activity, life skills training, and social connectivity for the general population. We presented evidence to suggest that these three components are fundamentally important for people with SMI, and, more specifically, individuals with a FEP; the evidence suggests that the degree of recovery from psychosis may hinge on these three components. Because the fundamental components of sport include physical activity, social connectivity, and the potential for life skills development, we contend that sport-based life skills interventions designed specifically for people with FEP could aid in the recovery process. In the following sections, we detail three key elements to consider for the development of such interventions.

3.11.2 | Early intervention greatly reduces chance of chronic illness

Targeting people at their first episode of psychotic illness has been shown to reduce functional (social and occupational) impairment later in life. The effectiveness of early intervention is explained by at least four factors: (1) the years immediately following onset of psychosis are considered a critical period in the sense that individuals are most vulnerable to relapse (Hughes et al., 2014); (2) onset generally occurs at an especially sensitive developmental time, and at this early stage of illness individuals are less removed from the developmental trajectory of their healthy peers, and thus benefit most from early intervention (McGorry et al., 2008); (3) individuals are more likely and able to engage in help-seeking behaviour at this early stage, before the side-effects worsen (Hughes et al., 2014); and (4) people who are younger and less burdened by cardiometabolic diseases are at a more optimal age to engage in and create physical activity habits (Firth, Carney, Elliott, et al., 2016). In addition to these social and health benefits, early intervention is more cost effective; specifically, it is estimated that specialized early intervention psychosis programmes can offer greater recovery rates at one third the cost of standard care (Mihalopoulos, Harris, Henry, Harrigan, & McGorry, 2009).

3.11.3 | Feasibility matters: Considering barriers and enablers to participation

It is important that intervention designs account for the barriers and enablers to sport participation for people with FEP. Physical activity interventions for people with SMI have historically low recruitment and retention rates. Scholars urge that for people with FEP, it is critical that interventions offer personalisation for the intervention, even in group settings (eg, offering varying options or supporting individual goal setting; eg, Curtis et al., 2016; Firth, Carney, Elliott, et al., 2016). Although it is important to cater to the individual, adherence can be maximized through a combination of group and individual work (Ward, White, & Druss, 2015). In a recent qualitative exploration of the effects and determinants of exercise participation in people with FEP, Firth, Carney, Jerome, et al. (2016) found both autonomy (eg, choosing the activity) and social support (eg, having an exercise

buddy) to be critical factors in engaging participants; in contrast, anxiety and lack of motivation were key barriers. In a subsequent survey study, Firth, Rosenbaum, Stubbs, et al. (2016) found that increased fitness/energy, distraction, and gaining confidence were the strongest motivating factors. Motivating factors are important, as they need to be prominent enough to override the psychosocial vulnerabilities created by both positive and negative symptoms that can make engagement challenging (Soundy et al., 2014). More broadly, the stigma of mental illness must be kept in mind such that interventions should include normalizing components (eg, marketing materials and attire of programme facilitators that lessen the feeling of being “other” for the participants; see Gronholm, Thornicroft, Laurens, & Evans-Lacko, 2017). Considering the novelty of this call to action, it would be valuable to explore the feasibility of a sport based-life skills intervention specifically for young people with FEP via general perceptions of such a programme, its preliminary effects, and the perceived barriers and enablers to engagement.

3.11.4 | Methodological rigour is needed in regards to sport-based life skills interventions

One must be cautious of the common “sport evangelist” mindset. This mindset is the tendency within the field to “blindly believe that sport participation inevitably contributes to youth development because sport’s assumed essential goodness and purity is passed on to those who partake in it” (Coakley, 2011, p. 306). It is easy to fall into the trap of assuming that life skills will naturally be acquired and transferred to other domains through sport participation with little systematic effort, despite evidence on the contrary (Pierce, Gould, & Camire, 2017). One must be aware that sport also has the capacity to do harm (eg, through exclusion or comparison to more successful peers; Conrad & White, 2015), and be mindful of the intervention design and processes to utilize and maximize the benefits of sport. The use of people with sport expertise and an understanding of relevant theory to develop and facilitate the work may support this effort. As with any intervention programme, clarity and detail is imperative in regards to programme components, life skills definition, life skill measurement, and mechanisms of life skill transfer (Pierce et al., 2017). Key considerations for life skills training are the notions of training and transferability; that is, life skills are developed in one context and then applied effectively in another domain, demonstrating the interactive nature of development. It is important to note that the transfer of life skills across contexts doesn’t just happen automatically, but is maximized via systematic attempts to create an environment that promotes transfer, including (1) similarity of context, (2) opportunities to use skills, (3) support for transfer, and (4) rewards for transfer (Pierce et al., 2017).

4 | LIMITATIONS

This review is not without its limitations. The narrative review approach taken allowed for the amalgamation of separate research areas to highlight a gap in the research and clinical care practices. However, because our focus was on evidence that was relevant to our thesis, the unsystematic nature of our search meant that we may

have missed important studies and/or been biased in selection and interpretation. Efforts to eliminate such bias included reflective team discussions. Furthermore, study quality was unassessed and therefore excluded from the synthesis of information.

5 | CONCLUSIONS

The conceptual and empirical evidence presented in this paper highlights the potential for sport-based life skills interventions to be a powerful tool in the recovery of FEP, and the prevention of future relapse. We discussed recovery post-FEP as a complex process with two main goals: (1) minimize symptoms and (2) enable functional recovery. We have demonstrated that these two goals are supported by physical activity, life skills acquisition, and social connectivity. Against this conceptual backdrop, we argued that sport is an ideal platform to integrate these three components. As such, we provided a call to action that sport-based life skills interventions should be developed for those recovering from FEP and suggestions for intervention design.

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Appendix B: Published Article

Published Article (Chapter 3)

Brooke, L. E., Gucciardi, D. F., Ntoumanis, N., & Lin, A. (2019). Qualitative investigation of perceived barriers to and enablers of sport participation for young people with first episode psychosis. *Early Intervention in Psychiatry*. doi: 10.1111/eip.12854

Qualitative investigation of perceived barriers to and enablers of sport participation for young people with first episode psychosis

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Abstract

Aims: The aim and objective of the study was building on a previous call for the development of sport-based life skills interventions for young people with first episode of psychosis (FEP) (Brooke, Lin, Ntoumanis, & Gucciardi, 2018), to explore the barriers and enablers to sport participation for young people with FEP.

Method: We used a semi-structured interview format to conduct one-to-one interviews with young people (aged 16-25; n = 10) with FEP, and one-to-one interviews and focus groups with their clinicians (n = 33). Questions focused on barriers and facilitators (intrapersonal, interpersonal, psychological, environment, health/safety, logistical) to sport participation young people with FEP. Thematic analysis was used to analyse the data.

Results: Four themes (and 11 sub-themes) emerged from the analysis: (a) the need for sport in FEP recovery (perceived benefits; resource gap); (b) barriers (logistical; psychological); (c) enablers (positive environmental expectations and experiences) and (d) programme design (sport programme/type; life skills training; application to barriers/enablers).

Conclusion: The participants responded favourably to the idea of using sport to promote recovery post-FEP, and provided an insight into why sport is currently under-utilized within FEP recovery efforts. The barriers, enablers, and specific suggestions for how to limit the barriers and strengthen the enablers are valuable for sport-based intervention design, and may be applicable to non-sport-based interventions for people with FEP.

KEYWORDS

early intervention, first episode psychosis, functional recovery, life skills, sports

1 | INTRODUCTION

It is well documented that early intervention following an individual's first episode of psychosis (FEP) is critical to reduce long-term negative impact on functioning, health, and well-being (eg, Santesteban-Echarri et al., 2017). In conjunction with symptom reduction, the predominant treatment goal post-FEP is increased functional recovery levels. Some

integral components of functional recovery include: (a) physical activity (PA) to promote mental health and well-being (Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014; Schuch et al., 2018), and combat the cardiometabolic problems associated with psychotic illness and medication (Correll et al., 2017; Vancampfort et al., 2015); (b) social connectivity in an effort to target the ill-effects of social isolation associated with FEP (Gee et al., 2016; McCarthy-Jones,

Marriott, Knowles, Rowse, & Thompson, 2013) and (c) life skills development to support an individual's ability to cope and thrive after experiencing a FEP at a critical time in psychosocial development (McGorry & Goldstone, 2016).

Published interventions that combine PA, social connectivity, and life skills development for FEP are scarce. Sport has been forwarded as a useful intervention platform from which to combine these three components (Brooke et al., 2018). First, sport is a type of PA "involving physical exertion and skill as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations" (Commonwealth of Australia, 2011, p. 7). Although related, sport is different to exercise, which is "a subset of physical activity that is planned, structured, and repetitive, and has as a final or intermediate objective of the improvement of physical fitness" (p. 7). The difference between sport and exercise is critical for the understanding of the context of this paper. It is through the structures embedded within sport (eg, rules, competition, organization, community) that sport is able to provide opportunities for more than just PA, as the next two points will illustrate. Second, it is well documented that sport has the capacity to promote social connectivity and bring people from varying backgrounds together, transcending social, cultural and political divides (Conrad & White, 2015). Lastly, sport has been shown to be a useful platform from which to teach essential life skills (eg, confidence, communication, emotional regulation) to vulnerable populations (Hermens, Super, Verkooijen, & Koelen, 2017). Life skills in this context are defined as cognitive, emotional and behavioural skills that can be learned in one context (eg, through sport) and transferred to and used effectively in other contexts (such as education; Gould & Carson, 2008).

Given the documented need for dynamic early-intervention approaches (Santesteban-Echarri et al., 2017), combined with the call for more PA-based interventions for people with FEP (iPHYS, 2013) and a recent call to action for further exploration into the use of sport within psychosis recovery (Brooke et al., 2018), we sought to develop a sport-based life skills intervention for young people recovering from FEP. As a starting point, an intervention mapping approach was employed (Bartholomew Eldredge et al., 2016). Part of the first step of intervention mapping is conducting a needs assessment to understand the problem (in this case, limited functional recovery post-FEP), the community (mental health services) and relevant stakeholders (young people with FEP and their families, and clinicians). To this end, we conducted interviews and focus groups with young people with FEP and their clinicians to gather information on the barriers and enablers to sport participation for young people with FEP.

2 | METHODS

2.1 | Participants

Participants were young people with a recent FEP receiving treatment from one of six local early-intervention psychosis services within the wider Perth region. Recruitment was conducted through the clinical

care teams at the services, and the services were asked to refer only young people who were stable enough in their symptomatology to participate. Inclusion criteria for young people were (a) between 16 and 25 years of age, and (b) had experienced a FEP within the past 3 years and (c) who were referred to the researchers for the interview by their clinical care team. Clinicians from the same early-intervention services working with young people with FEP were also recruited for interviews and/or focus groups. Rolling recruitment occurred over a period of 10 months until a sufficient level of data saturation was reached (O'Reilly & Parker, 2013).

2.2 | Procedures

We selected a semi-structured format for the focus-group and individual interviews for its ability to collect in-depth information, while encouraging participants to describe their own specific experiences, perceptions and expertise (Sparkes & Smith, 2014). In the interviews with young people, participants' beliefs, motivations and attitudes towards sport and sport-based programming were explored. Questions focused on barriers and facilitators (intrapersonal, interpersonal, psychological, environment, health/safety, logistical) to sport participation. Focus groups and interviews questions for clinicians related to their views on the barriers and enablers to sport participation for their clients, sport intervention design and recruitment suggestions. In all focus groups and interviews, an iterative approach was taken in which the interview guide evolved as interviews progressed, informing new initial and follow-up questions as the researcher's understanding of the local psychosis population's needs and resources expanded. For example, a point raised in one interview would be addressed in another even if it did not arise during the conversation organically, with an effort to ask the question in a non-leading manner (eg, "Other young people have expressed that having their clinician present at the sport program would be helpful, whereas some have said that they would prefer that they not attend. What are your thoughts on this?"). The interview guide is detailed in Table 1. Ethics approval for the study was obtained from the Western Australia Department of Health and Curtin University.

2.3 | Data analysis

All interviews and focus groups lasted 30 to 60 minutes, were transcribed verbatim, and analysed by the first author using NVivo Software (version 11; QSR, 2010). Thematic analysis was used because of its ability to generate key patterns in a way that is flexible and accessible (Braun, Clarke, & Weate, 2016). The data was analysed in a six-step iterative process, as outlined by Braun et al. (a) familiarization with data, (b) initial code generation, (c) theme search, (d) theme review, (e) theme definition and naming and (f) report production. First, the analyst—who has previous experience with thematic analysis—immersed themselves in the data by reviewing it empathetically and taking rough notes. Next, meaningful data segments were coded systematically and codes were collated and then organized into initial themes, allowing the data rather than the research questions to

TABLE 1 Interview guides for clinicians and young people with first episode psychosis

Participant type	Sample interview questions
Clinician	<ul style="list-style-type: none"> · What is your reaction to the idea of a sport programme designed to aid in the treatment and prevention of psychosis? · Have you heard of any similar programmes? (if yes, ask them to elaborate about their experience) · Would you be interested in recommending your clients to participate in such a programme? (why or why not?) · What would make participation challenging for your clients? <ul style="list-style-type: none"> ○ What barriers to sport participation would be unique to an FEP population? ○ What barriers to retention in such a programme would be unique to an FEP population? ○ Follow up with questions about cognitive, emotional, physical and environmental barriers. ○ Follow up with questions about timing, transportation and other logistical issues to be considered. · What psychological and/or emotional symptoms would deem an individual unfit for such a programme? · What ethical issues must we take into account? · What psychological safety issues must we take into account with a sport-based programme for young people with FEP? · What would you foresee being the potential risks of participation? <ul style="list-style-type: none"> ○ How can we limit these risks? ○ What actions can we take to mitigate harm? · What would help enable participation for your clients? · What steps can we take to encourage programme retention? · What sports would your clients be interested in playing? <ul style="list-style-type: none"> ○ Would your clients be more interested in individual or team sports? Why? · Would your clients be comfortable with playing sport with those of a different gender? · What would be the best way to advertise such a programme? · What psychological measurements would be relevant to consider using to evaluate the effectiveness of a sport-based life skills programme with an FEP population? · Are there any other considerations we should be aware of when designing such a programme?

(Continues)

TABLE 1 (Continued)

Participant type	Sample interview questions
Young people with first episode psychosis	<ul style="list-style-type: none"> · What role does sport play in your life? <ul style="list-style-type: none"> ○ What is your previous experience with sport? ○ Do you currently play any sports? ○ Are you a fan of any sport teams/athletes? ○ Do you enjoy any sports recreationally? ○ Are you physically active in other ways? ○ How has your involvement in sport/physical activity changed following their experience with a psychotic episode? · What is your reaction to the idea of a sport programme designed to aid in the treatment and prevention of psychosis? · Have you heard of or participated in any similar programmes? <ul style="list-style-type: none"> ○ (if yes, ask them to elaborate about their experience) · Would you be interested in participating in a sport-based programme to help young people develop skills that can be transferred to other areas of their life? (why or why not?) · What would make you more/less interested in participating? <ul style="list-style-type: none"> ○ Follow up with questions about timing, transportation and other logistics. · What would make it challenging for you to participate? (follow up with questions regarding logistical, psychological, social, etc., barriers) · What make it easier for you to participate? (follow up with questions regarding logistical, psychological, social, etc., barriers) · What would make you feel safe to participate (psychologically and otherwise)? · What sports would you be interested in playing? · Would you be more interested in individual or team sports? Why? · Would you be interested in playing with those of a different gender? · Sport can be a great platform to learn life skills like motivation, goal-setting, emotional regulation, etc.—what are your thoughts on a sport programme that is designed to teach these skills as part of the recovery process? · What would be the best way to advertise such a programme? · Is there anything else that you would like to add?

Note. Consent was obtained before beginning the interviews. With the young people, time was spent at the beginning of the interview to build rapport through friendly chat. The questions in this table only serve as a guide; probing follow-up questions were asked where relevant, and questions informed from previous interviews were added where appropriate.

drive the process. These themes were then reviewed and compared against the transcripts and the original codes. At this stage, it was verified that the themes and sub-themes were endorsed by a majority of the participants, and were refined accordingly. Next, the themes were named and defined. Throughout the coding, theme generation, and theme naming/refining stages, group discussions among the research group provided clarification via the challenging of ideas or interpretations. Young people and support worker data were analysed separately, and themes were combined where appropriate.

2.4 | Results

Ten young people ($M_{age} = 21.0$, 90% male, 75% live in family home, 90% completed final year of schooling, 100% Caucasian, 75% employed at least part time) and 33 clinicians (5 focus groups of 5-8 people; 7 one-to-one interviews) took part in this study. Four themes and 11 sub-themes relevant to programme design and implementation emerged from the analyses. Data across both the clinician and client groups were similar, thus we report themes together, with relevant group differences noted. The themes (and corresponding sub-themes) were: (a) need for sport in FEP (perceived benefits; resource gap); (b) barriers (logistical; psychological); (c) enablers (positive environmental expectations and experiences) and (d) programme design (sport programme/type; life skills training; application to barriers/enablers).

2.5 | Need for sport in FEP

All participants expressed support for a sport programme to promote recovery in young people with FEP.

2.5.1 | Perceived benefits

Participants discussed the potential benefits of a sport programme for young people with FEP. Young people expressed that they would be drawn to such a programme predominantly for fun, opportunities for building connections with others, and fitness/health. Participants indicated that a fun environment would provide a welcomed distraction to their mental illness or other life struggles:

For me, I think it would just be that time to just forget about things and just focus on something that you enjoy. Just have a bit of fun with that (young person).

In addition, young people were interested in the opportunity to socialize, and connect with others with a shared experience. Clinicians expressed similar views, yet their dialogue focused more on the benefits of PA, social opportunity and a sense of belonging:

Socialization and stigma, all these issues for these young people. And just getting a group, getting them a sense of community, getting them doing things other young people would be doing (clinician).

Clinicians discussed the cardiometabolic problems that accompany psychosis, and the importance of PA to combat these problems.

2.5.2 | Resource gap

Despite the acknowledged benefits of a sport programme for psychosis recovery, the participants noted few opportunities to engage in sport through their health services. The majority of services involved in the study offered opportunities for PA via group-based exercise (eg, yoga, walking, cycling, gym-based exercise). However, none of the services offered sport-based PA options as part of their therapeutic programme. Some of the young people recalled enjoying sporting opportunities while in hospital, and expressed interested in a sport programme as part of (or supported by) their mental health service provider:

Yeah, it'd definitely be interesting. When you mentioned it, I thought, "Oh, what a great idea." Sports always helped me, and I know that even when I was in hospital, they had a basketball hoop outside, and that helped me with my life, just getting outside and doing something, taking your mind off things. And I think that would be great for so many other people that've experienced mental health issues, because it does. It's like another world. It takes your mind off things. Just, yeah, it's great for that (young person).

Many of the clinicians noted that services were "resource poor" and unable to offer sport programmes, or support a client's engagement in community sport programmes. The majority of the young people revealed that they had prior experience in organized sport, but that many of them had disengaged in sport for various reasons, including their mental illness. As one clinician described:

One of the things that I've noticed with a few young people is they were very actively involved in sports at school, but they haven't been engaged in sports as an independent adult. It's really tricky for them, especially with a mental illness.

Participants explained that participating in existing community sport channels (or returning to their previous sport clubs) is difficult for young people with FEP:

I would definitely want to try (getting involved in sport again) because it's good for me, but it's mainly just getting the funds to do it, which is my problem because I'm not able to work (young person).

I think sports can sometimes break down barriers, but it's just the initial step to getting into it. I have a client who would love to be doing sport, but he can't handle

being around his old (sporting friends) because he had some poor incidents with them, in terms of his psychosis. They now haven't supported him, and he feels he can't go back to (sport). Not only has he lost that friendship group, but he lost that hobby (clinician).

2.6 | Barriers

Participants reported several perceived barriers to engagement in a sport programme for young people with FEP. They highlighted logistical and psychological barriers, and emphasized how these are interrelated.

2.6.1 | Logistical barriers

All participants expressed logistical concerns that could limit engagement in a sport-based life-skills programme, the most predominant of which were limited resources and location. Limited resources included financial resources to buy sport clothing and equipment, and transportation challenges. Clinicians discussed that most clients do not drive, and cannot always rely on friends or family for rides. Public transportation is both expensive and psychologically daunting for some young people with FEP. The young people reported that they generally do not drive, and tend to rely on bike, skateboard, foot or, if necessary, public transport. In regards to location, participants explained that the need to travel a far distance negatively affects motivation, and can also trigger psychological symptoms like anxiety or paranoia in regards to transport options, especially on public transportation:

A lot of (clients) don't go very far from their houses really and they get quite anxious and potentially more paranoid the longer they have to travel on public transport (clinician).

2.6.2 | Psychological barriers

Psychological barriers were the most commonly discussed topic they emphasized that psychotic symptoms create barriers that are challenging to navigate for both the young person and their service provider. The primary psychological barriers discussed were anxiety, low motivation and low self-efficacy.

Anxiety

Anxiety included both generalized and social anxiety, and experiences such as fear of judgement, fear of meeting new people and anxiety pertaining to navigating transportation or trying something new. Many of the conversations about anxiety led to the stigma of mental illness, which participants described as creating and/or having a compounding effect on anxiety:

Because it can be a little bit embarrassing. Like, I don't really mind, I don't care who knows, but like, it is a bit like, to really go from being a certain type of person and you have an episode and it's like, maybe there's something wrong with me, and then you know, like, you're not exactly the same as you once were. You kind of second-guess yourself a little bit more... you've just gotta be careful of, like, being judged (young person).

In talking about anxiety, some of the participants suggested that the residual paranoia also contributes to anxiety, and could foster distrust and provide a barrier to engagement:

There's general anxiety, and then some of my clients have got an underlying paranoia about the sporting clubs or clubs in general or the government or local council and things like that (clinician).

Clinicians suggested that, in regards to sport participation, many of their clients have experienced social marginalization and had negative experiences with organized sport, further contributing to anxiety. This notion was absent from the young people's discussions of their past experiences with sport, all of whom expressed a positive history with sport; however, it may be that those clients with bad sport experiences did not choose to engage in the interviews.

Low motivation

All participants suggested that low motivation would be a barrier to engagement in a sport programme. Low motivation was described by participants as a direct result of psychosis, antipsychotic medication and substance use. Many clinicians gave the example of low attendance numbers in functional recovery programmes because of low motivation, even when other barriers like transportation are absent. Young people described low motivation as a constant barrier in their general life and regarding PA in particular:

Well, probably just being tired from work or if it's a bit late and I've had a shower, then I'm just like "I'm already ready for bed." Those are the main things that stop me from going to the gym. But also, because I smoke a bit of weed, so if I've had some weed than that would be another reason why I wouldn't go because I'm just stoned, that's it (young person).

Participants also expressed a desire to learn ways to overcome low motivation:

Like getting more motivated would be definitely one of the things (I need) because I find it's hard to get motivated these days, especially because of my psychosis. So, yeah just having more motivation to go out and

having someone to give you motivation to go would definitely be a big help (young person).

Low self-efficacy

Participants, particularly clinicians, frequently pointed to low self-efficacy as a barrier, suggesting that low confidence in one's ability to participate in the sport activities, to engage successfully in social interaction, and/or to navigate transportation options would serve as barriers to engagement:

Not knowing what to expect, not knowing who's going to be there and not thinking that they can do it, so this confidence kind of (clinician).

Some of the young people expressed concerns regarding perceived sporting incompetence—especially relative to their past experiences—as potentially heightening their anxiety and resistance to engage in a sport programme:

Just being worried that you're not at that same level as before. I always had a huge anxiety because I didn't want to let the team down (young person).

2.6.3 | Interplay of barriers

It is clear that each of the identified discussed barriers on their own could limit engagement, but participants described them as being interrelated. For example, a low degree of anxiety on its own may not necessarily prohibit engagement, but if coupled with low motivation and/or low-self efficacy, the barriers to participation may become insurmountable. Psychological and logistical barriers share the same interplay. For example, participants indicated low motivation may not necessarily preclude participation in a sport programme, but if the programme is far away and/or is challenging to get to, the chance of attending may decrease.

2.7 | Enablers

Participants reported potential enablers to participation in a sport-based, life-skills programme, the majority of which related to positive environmental expectations and experiences.

2.7.1 | Positive environmental expectations and experiences

Participants explained that the expectations of the sport programme environment are critical to facilitating initial engagement and that the actual experiences of the environment will determine sustained participation. It is important that young people expect and experience an environment that is safe, flexible, supportive, normalized and

logistically easy; and that they experience (but not necessarily initially expect) an environment that is conducive to growth experiences.

Safety

Participants described a safe environment as one that is inclusive, inviting and informed. Young people described feeling included when they do not anticipate or experience judgement, such as when there are others there with a shared experience:

Like, I remember being really confident while I was (at a hospital-based exercise group) because I felt like there was other people that were going through the same thing as me and it didn't feel as weird... So you can be yourself a little bit more. So I think with other people who have gone through psychosis if that was, if somehow that was made known, that there would be other people who have experienced the same thing (young person).

Perceptions of inclusion were also characterized by an environment that is open and friendly (eg, familiar faces). In terms of feeling informed, participants described key aspects as knowledge of processes or activities, who will be there, and available resources should they experience challenges. Participants indicated that expectations and experiences of environmental safety are heightened when the facilitators are inclusive (ie, knowledgeable and empathetic about psychosis), inviting (ie, are a familiar and friendly face) and informed (ie, the mental health history, needs and triggers of the young person are known). Clinicians emphasized the importance of recruiting through the clinical care teams to promote safety, thereby ensuring that only individuals at an appropriate point in their recovery are invited into a sport intervention.

Flexibility

It was clear that the needs of young people with FEP are varied, and there is no "one size fits all" approach; a sport programme designed for young people with FEP must be flexible to allow for different needs. This variance includes sport preferences, sport experience/abilities, recovery trajectories, backgrounds and symptomology. The programme would need to allow for variations in individual symptoms for day-to-day or week-to-week (such as allowing graded participation). Participants expressed the importance of meeting the individual needs of the young people where possible, which could be accomplished in part by, for example, asking the individual what they want to get out of the programme, what their concerns are, and how they would like to be supported.

Well, probably having someone like you, or a person that knows about the program very well to maybe talk to them first, so have a meeting before the thing, ask them similar questions, like "What are you ..." not afraid of, but "Are you willing to come to the group?" Or, "What do you want in terms of ...What do you

want to get out of the group?" And I think that if you have that talk, then the time when you do, they'll go. When it is time to come to the group, then they actually have someone that they feel like they can rely on, that they know, so that it's not just them by themselves there (young person).

Support

The expectation and receipt of support is important for initial engagement and sustained participation in the sport programme. This support can come from programme itself, the mental health service provider, fellow participants or others (eg, family or peers). The support could be logistical (eg, transport support), emotional (eg, listening and reassuring in a challenging moment) or motivational (eg, encouraging reminders or positive feedback). The participants expressed that the opportunity for a young person to bring a supportive peer may enhance actual and perceived support:

Bring a brother, or bring, bring a cousin or whatever. It doesn't matter, bring somebody. That would make you feel a lot more comfortable being outdoors. I guess you would have a lot more fun and...It wouldn't really be like about the illness, it would like be more of a community thing (young person).

Normalization

Participants stressed the importance of meeting the specific needs of young people with psychosis, yet they also emphasized they are young people before "young people with psychosis," and that the environment should reflect this. Mental illness should be considered, but not at the expense of a sense of normalcy. Participants indicated that an environment feels normalized when it is relatable, fun and real. They described a relatable environment as one where people can connect over commonalities. These commonalities may be, for example, a shared experience of psychosis between participants, or a shared common interest between participant and facilitator. An environment is more relatable when there are limited power differentials (eg, participants have opportunities to lead). Participants, especially the young people, described an environment as fun if it emphasizes the activity over recovery. Participants described an environment that is real as one that looks and feels like a sport programme more than anything else:

I think sometimes with stuff like this you have to be careful that you don't place too much emphasis on the mental health because a lot of our client group don't want to be associated with stuff like that. You need to be kind of careful when marketing that whole mental health side of things. If you focus on that too much, then it kind of may push people away (clinician).

Logistical ease

All participants stated that if the participants expect and experience the process of sport engagement (eg, enrolling, getting to the venue, filling out forms, getting home) to be straight-forward and affordable, they will be more likely to attend and return.

Growth experiences

The participants expressed that the above enablers, combined with growth experiences, will foster sustained engagement. Growth experiences occur when individuals experience growth in their physical abilities (eg, enhanced sporting skills), their health (eg, enhanced fitness), their psychosocial functioning (eg, successful social interactions), life skills (eg, enhanced motivation or confidence), or when they overcome a challenge (eg, navigate public transport despite anxiety). Participants suggested that if the sport programme environment enables such experiences, then the barriers to engagement will be easier to overcome and the individual will be more likely to return. It is important to note that such experiences should not necessarily be the selling point of the programme to obtain initial engagement. Although some young people expressed the opportunity for growth experiences as a motivating factor to attend, most explained that if the programme was advertised as promoting such growth experiences, they may be less likely to attend:

Yeah, because if they feel like they're going to meet a bunch of new people, like that's great for them, but if you remind them they're meeting people it's not going to work because that can provoke anxiety (clinician).

2.8 | Programme design

Participants offered specific design recommendations for a sport programme for young people with FEP. The design recommendations related to: (a) sport/programme type preferences, (b) the inclusion of a life skills training element within the programme and (c) specific ways to limit barriers and strengthen enablers (see Table 2 for application suggestions).

2.8.1 | Sport or programme type preferences

Participants provided feedback on four different types of sport programmes: (a) a multiple week, single sport programme, (b) a multiple week multi-sport programme, (c) a condensed 2 to 4 day retreat style programme and (4) a one-to-one mentoring programme that would connect participants with existing sport programmes within the community with support provided. The responses to each were positive, with mixed preferences on a top choice. In general, a multi-sport format was preferred over a single sport as it might appeal to more people, and more easily allow participants to reintegrate after a missed session. Many participants expressed interest in a combination of the three programme types (eg, multi-week programme that leads into

TABLE 2 Design recommendations from participants to limit barriers and strengthen enablers

Barrier/enabler (sub-theme)	Design recommendations: Do	Design recommendations: Do not
Barriers: <i>logistical</i>	<ul style="list-style-type: none"> · Provide transport support (eg, rides or vouchers) · Provide support for transport planning (eg, help young person map out route; have someone do route with them first time) (C only) · Consider proximity (eg, run programme in close proximity to young people's homes and public transport lines) · Provide sport kit if needed (C only) 	
Barriers: Psychological; <i>anxiety</i>	<ul style="list-style-type: none"> · Provide opportunities to "meet and greet" (eg, BBQ before programme begins) · Encourage "bring a friend" (eg, young people bring a friend, family member, clinician, partner, etc. to accompany them and participate in programme) · Provide support for transport planning (eg, help young person map out route) · Consider proximity (eg, run programme in close proximity to young people's homes and public transport lines) · Programme facilitators to have a presence at the service to become "familiar faces" (C only) 	
Barriers: Psychological; <i>low motivation</i>	<ul style="list-style-type: none"> · Provide reminders · Provide food · Provide opportunity to reflect on and practice growth experiences (C only) 	
Barriers: Psychological; <i>low self-efficacy</i>	<ul style="list-style-type: none"> · Allow graded participation (eg, allow a participant to initially observe, and slowly encourage participation) · Model participation (eg, facilitators with low sport skills still participate) · Adjust rules of play to suit abilities · Provide basic sport skill training through simple and fun activities · Encourage goal-setting · Provide support for transport planning (eg, help young person map out route; have someone do route with them first time) (C only) · Provide activities that facilitate social interaction 	
Enablers: Positive environmental experiences and expectations; <i>safe</i>	<ul style="list-style-type: none"> · Learn mental health history of participants · Create a collaborative (eg, engage young person in process) support/crisis management plan for each individual · Create regular feedback loop between programme and care team · Clarify resources available to participants (eg, who to go to for more support, transport/kit support) · Encourage "bring a friend" (eg, young people bring a friend, family member, clinician, partner, etc. to accompany them and participate in programme) 	<ul style="list-style-type: none"> · Allow facilitators to just observe

(Continues)

TABLE 2 (Continued)

Barrier/enabler (sub-theme)	Design recommendations: Do	Design recommendations: Do not
	<ul style="list-style-type: none"> · Educate facilitators on psychosis and what to expect, and how to support · Recruit through service to ensure physical and mental fitness to participate (C only) 	
Enablers: Positive environmental experiences and expectations; <i>flexible</i>	<ul style="list-style-type: none"> · Discuss mental health history, needs, concerns and goals with each participant · Cater programme activities to needs/abilities of participants · Provide a range of sport options · Provide alternative activities · Allow graded participation (eg, allow a participant to initially observe, and slowly encourage participation) 	<ul style="list-style-type: none"> · Mandate regular attendance · Require participation
Enablers: Positive environmental experiences and expectations; <i>supportive</i>	<ul style="list-style-type: none"> · Provide transport support (eg, rides or vouchers) · Provide support for transport planning (eg, help young person map out route; have someone do route with them first time) (C only) · Provide sport kit if needed (C only) · Create a collaborative (eg, engage young person in process) support/crisis management plan for each individual · Create regular feedback loop between programme and care team · Clarify resources available to participants (eg, who to go to for more support, transport/kit support) · Encourage "bring a friend" (eg, young people bring a friend, family member, clinician, partner, etc. to accompany them and participate in programme) · Educate facilitators on psychosis and what to expect and how to support 	
Enablers: Positive environmental experiences and expectations; <i>normalized</i>	<ul style="list-style-type: none"> · Focus on fun components (eg, sport activity, social time, eating) · Encourage facilitators to engage with participants and find common ground · Use facilitators that participants can connect with (eg, similar age, lived experience, etc.). · Encourage facilitators and leads to participate · Encourage participants to lead where relevant · Be aware of language (eg, terms like goal setting or mindfulness have been over used with this population and therefore will carry little value) (C only) · Prioritize "getting foot in the door," and creating an enjoyable experience 	<ul style="list-style-type: none"> · Focus on mental illness · Market only recovery components
Enablers: Positive Environmental Experiences and Expectations; <i>Logistically easy</i>	<ul style="list-style-type: none"> · Provide transport support (eg, rides or vouchers) · Provide support for transport planning (eg, help young person map out route; have someone do route with them first time) (C only) 	

(Continues)

TABLE 2 (Continued)

Barrier/enabler (sub-theme)	Design recommendations: Do	Design recommendations: Do not
	<ul style="list-style-type: none"> · Consider proximity (eg, run program in close proximity to young people's homes and public transport lines) · Provide sport kit if needed (C only) · Minimize data collection (eg, overlap with service data collection if possible) (C only) · Prioritize "getting foot in the door," and creating an enjoyable experience. Make first experience(s) as enjoyable and logistically easy as possible. 	
Enablers: Positive environmental experiences and expectations; <i>growth experiences</i>	<ul style="list-style-type: none"> · Be aware of language (eg, terms like goal-setting or mindfulness have been overused with this population and therefore will carry little value) (C only) · Provide time to reflect, discuss and share (C only) · Prioritize "getting foot in the door," and creating an enjoyable experience. Then, once confidence builds and anxiety decreases, include targeted growth experiences 	<ul style="list-style-type: none"> · Focus only recovery/growth components

Note. Some "do not" cells are empty as there were not specific recommendations for what not to do for each type of barrier/enabler. Some recommendations are repeated due repetition across themes. Recommendations were made by both clinicians and young people unless noted ("C only" or "YP only").

a retreat and culminates with connecting participants to existing community programmes). Some clinicians provided caution regarding any overnight programme because of managing substance use. Popular sport preferences were touch Australian rules football, touch rugby, ultimate Frisbee and soccer, but the consensus was that any sport would be advisable providing the programme caters for all levels of sporting experience.

2.8.2 | Life skills training element

Participants provided feedback on the inclusion of a life skills training element within a potential sport programme. Participants responded positively to this notion, but also expressed caution. All underscored the importance of life skills for functional recovery, and were responsive to the idea that sport can be used to teach such skills. Young people were predominantly interested in developing motivation, social skills, confidence and emotional regulation, whereas clinicians focused more on the need for motivation, social skills and confidence building. Both groups suggested that a life-skills training element be embedded gently, so as not to hinder engagement. Young people in particular expressed that their desire to engage in a sport programme would be largely to forget about their mental illness or be distracted from symptoms; a heavy focus on life skills training could impede this.

2.8.3 | Application

Participants were asked to provide specific recommendations in regards to strengthening enablers or limiting barriers to participation

in a sport programme for young people with FEP. A summary of their responses is provided in Table 2.

3 | DISCUSSION

This study is the first to explore barriers to and enablers of sport participation for young people with FEP, and adds to the limited qualitative literature exploring PA engagement in people with FEP (see Firth et al., 2016). This knowledge is particularly important considering challenges of engagement in recovery services for people with FEP (Tindall, Allott, Simmons, Roberts, & Hamilton, 2018). Our results indicate that the dynamic nature of sport (encompassing PA, social connectivity and life skills development) may provide an opportunity to maximize the time that young people with FEP engage with recovery focused activities. Participants' responses suggest that gaining initial engagement in sport-based programmes will be challenging, but that the growth opportunities inherent in sport may facilitate subsequent increased engagement. Echoing a finding by Firth et al. (2016), we found that catering to the specific needs of people with FEP is imperative for adherence and engagement. Similarly, the importance of designing to the preferences and needs of young people has been supported in exercise programmes for young people with depression (eg, Carter et al., 2015). The knowledge that individual preferences are important to young people is valuable within sport programme design and beyond.

Barriers to PA for people with FEP such as low motivation and symptomatology have been previously reported (see Firth et al., 2016;

Vancampfort et al., 2018). However, the anxiety and low confidence found in the current study have not been documented elsewhere. It may be that the components of sport trigger greater levels of social anxiety and lower levels of self-efficacy (eg, because of the group aspect or specialized skills required). Such an interpretation could explain previous findings that people with FEP prefer gym-based exercise to sport (Firth, Carney, Jerome, et al., 2016). It may not be that the gym is actually preferred over sport, but that the gym may appear more safe and accessible—an important notion to explore further and consider in intervention design.

The importance for an environment to cater to the needs of the individual and provide support and the opportunity to relate to others was evident in this study. Motivational theories, such as self-determination theory (SDT), provide a conceptual backdrop upon which to interpret these findings. Informed by SDT, social contexts can nurture people's inner motivation by satisfying their psychological needs of autonomy (eg, engaging the individual in designing their care plan), relatedness (eg, providing an environment where participants and facilitators can relate to one another) and competence (eg, catering a programme to meet the needs of the individual so that they can set and achieve goals; Ryan & Deci, 2017). Promoting autonomy and social support have been found to be critical in engaging people with FEP in exercise (Firth, Carney, Elliott, et al., 2016). Self-efficacy has been found to be important to sustain PA intentions in people with psychosis (Lee et al., 2018). In addition, Vancampfort et al. (2018) showed that autonomous forms of motivation (eg, enjoy the activity itself, value the benefits of an activity) may play a pivotal role in adopting and maintaining PA activity for people with FEP. Taken together with past work, our findings underscore the importance of a motivationally enriched sport-based, life-skills programme (eg, see Ntoumanis, Quested, Reeve, & Cheon, 2018 as to how to create motivationally supportive sports environments).

4 | LIMITATIONS AND FUTURE DIRECTIONS

The findings have implications for FEP intervention globally, but it is necessary to consider that our interviews and focus groups were conducted in and around Perth, Australia. Demographic information for the clinicians was not collected; such information could have provided additional context for the interpretation of the results. In addition, the sample of young people was relatively small. Although a sufficient level of data saturation was reached in these interviews, it is important to note that all the young people were Caucasian, predominantly male, and had a sporting background. In discussions regarding the limited diversity in participants, the services reported that their client base is predominantly male, and that more male clients were eligible and/or interested in participating. This may speak to the demographic within this population that are interested in sport, and the reports by young people in this study may be limited in regards to their application to other genders or ethnicities. Future work should further explore and consider how gender and culture may influence barriers

and enablers to sport participation, and sporting preferences for young people with FEP.

The current study highlights some of the many benefits that sport participation affords, and implores future work in FEP recovery to consider the use of sport. However, it is important to note that just because the benefits of sport participation are well documented, not all sport is inherently beneficial. It is important that researchers and service providers do not take on the “sport evangelist” mindset, that is, “blindly believe that sport participation inevitably contributes to development because sport's assumed essential goodness and purity is passed on to those who partake in it” (Coakley, 2011, p. 306). For example, researchers have found that sport participants do not automatically inherit sport-based life skills development simply through participation, but that systematic efforts are required for life-skills development and transfer (Pierce, Gould, & Camire, 2017). In addition, despite the many positive benefits of sport participation, there are also potential dark sides to sport that must be considered. For example, it has been documented that sport settings can be home to bullying (eg, Mishna, Kerr, McInroy, & MacPherson, 2019), discrimination (eg, Krane, 2016) and increased substance use (eg, Grace, Knight, Rodgers, & Clark, 2017). Given the vulnerability of people with FEP to such problems, it is critical that researchers and service providers consider the positive effects against these potential dark sides when using or encouraging sport with this population.

5 | CONCLUSION

The findings emphasize the unique and varied needs of young people experiencing FEP. Our findings provide knowledge that can be used to guide the design of sport-based interventions for this population, and may be useful in early intervention design in general. The participants reported noteworthy challenges in engaging young people with FEP in sport. However, the reports given by participants suggest that the potential recovery benefits within sport should implore us to persevere in seeking ways to limit the barriers and maximize enablers enough to enable engagement.

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DATA ACCESSIBILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action

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Appendix E: Attribution Statements

Attribution statements for Chapter Two and Chapter Three

Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action

Qualitative investigation of perceived barriers to and enablers of sport participation for young participants with first episode psychosis

To Whom It May Concern,

I, Lauren Brooke, contributed the conception and design, acquisition of data and method, analysis, and interpretation and discussion for the publications entitled:

- Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action
- Qualitative investigation of perceived barriers to and enablers of sport participation for young participants with first episode psychosis

I, as a Co-Author, endorse that this level of contribution by the individual indicated above is appropriate.

Daniel Gucciardi

Ashleigh Lin

Nikos Ntoumanis

To Whom It May Concern,

I, Daniel Gucciardi, contributed in a supervisory role for the publications entitled:

- Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action
- Qualitative investigation of perceived barriers to and enablers of sport participation for young participants with first episode psychosis

I, as a Co-Author, endorse that this level of contribution by the individual indicated above is appropriate.

Lauren Brooke

Ashleigh Lin

Nikos Ntoumanis

To Whom It May Concern,

I, Ashleigh Lin, contributed in a supervisory role for the publications entitled:

- Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action
- Qualitative investigation of perceived barriers to and enablers of sport participation for young participants with first episode psychosis

I, as a Co-Author, endorse that this level of contribution by the individual indicated above is appropriate.

Lauren Brooke

Daniel Gucciardi

Nikos Ntoumanis

To Whom It May Concern,

I, Nikos Ntoumanis, contributed in a supervisory role for the publications entitled:

- Is sport an untapped resource for recovery from first episode psychosis? A narrative review and call to action
- Qualitative investigation of perceived barriers to and enablers of sport participation for young participants with first episode psychosis

I, as a Co-Author, endorse that this level of contribution by the individual indicated above is appropriate.

Lauren Brooke

Ashleigh Lin

Daniel Gucciardi

Appendix F: Ethical Approval

Ethical Approval for Chapter Three

Qualitative investigation of perceived barriers to and enablers of sport participation for young participants with first episode psychosis



Government of **Western Australia**
North Metropolitan Health Service
Mental Health

15 May 2017

Ms Lauren Brooke
 Curtin University
 School of Physiotherapy and Exercise Science
 3/135 Alice Street
 DOUBLEVIEW WA 6018

Dear Ms Brooke

(Project 13_2016) A Mixed-Methods Investigation of Perceived Barriers and Enablers of Sport Participation for Young People Experiencing First Episode Psychosis

The above research project was considered by the North Metropolitan Health Service – Human Research Ethics Committee and found to be satisfactory and compliant with the NHMRC requirements and the WA Health Research Governance Policy.

On behalf of the NMHS-MH HREC I hereby grant ethical approval to the study.

This project has ethical approval until the **13 October 2020**. If you would like to extend your project beyond this date, please write to the NMHS MH Research Ethics and Governance Office requesting an extension of up to three additional years.

This approval is in conjunction with the Terms of Approval statement, which is attached to this letter.

The NMHS MH reviewed and approved the following documents:

- National Ethics Application Form (NEAF) v2.2;
- Western Australian-Specific Module v1, 01 August 2016;
- WA Health Research Protocol v3, 01 August 2016;
- FEP Client Poster v 2, 01 October 2016;
- FEP Relative Poster v2, 01 October 2016;
- Relative Invitation to participate v3, 01 December 2016;
- Clinician Invitation to participate v3, 01 December 2016;
- Client Invitation to participate v3, 01 December 2016;
- Parent/Guardian Information Sheet and Consent Form v3, 01 December 2016;
- Client Information Sheet and Consent Form v3, 01 December 2016;
- Relative Information Sheet and Consent Form v3, 01 December 2016;
- Clinician Information Sheet and Consent Form v3, 01 December 2016;

- Minor Client Information Sheet and Consent Form v3, 01 December 2016;
- FEP Client Questionnaire v2, 01 October 2016;
- FEP Relative Questionnaire v1, 01 August 2016;
- FEP Relative Interview Guide v1, 01 August 2016;
- Client Interview Guide v2, 01 October 2016;
- Clinician Interview Guide v1, 01 August 2016.

This ethics approval is given for this project to be conducted at the following sites:

- 🕒 PaRK/RUAH Early Intervention for Psychosis Services (EIP) ;
- 🕒 Bentley EIP;
- 🕒 Fremantle EIP ;
- 🕒 Midland Headspace Youth Early Psychosis Program (HYEPP);
- 🕒 Osborne Park HYEPP;
- 🕒 Joondalup HYEPP.

Please note that your project is subject to institutional monitoring, in accordance with section 5.5 of the National Statement on Ethical Conduct in Human Research and with the WA Health Research Governance Policy and Procedures.

This letter constitutes ethics approval only. This project CANNOT proceed at any NMHS MH site until institutional authorisation has been obtained from the Executive Director or Delegate of the institution.

The NMHS-MH HREC wishes you well for this project.

Please quote Project Number (**13_2016**) on all correspondence associated with this project and address it to:

NMHS-MH REGO
 Executive Officer
 Gascoyne House, Graylands Campus
 Locked Bag No. 1
 PO CLAREMONT WA 6910

Yours sincerely

Camelia Zota

Delegate of the Chair
 pp Prof Flavie Waters
 Chair NMHS MH HREC



Office of Research and Development

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28-Feb-2017

Name: Daniel Gucciardi
Department/School: School of Physiotherapy and Exercise Science
Email: D.Gucciardi@curtin.edu.au

Dear Daniel Gucciardi

RE: Reciprocal ethics approval
Approval number: HRE2017-0070

Thank you for your application submitted to the Human Research Ethics Office for the project A Mixed-Methods Investigation of Perceived Barriers and Enablers of Sport Participation for Young People Experiencing a First Episode Psychosis.

Your application has been approved by the Curtin University Human Research Ethics Committee (HREC) through a reciprocal approval process with the lead HREC.

The lead HREC for this project has been identified as North Metropolitan Health Service- Mental health- Human Research Ethics Committee.

Approval number from the lead HREC is noted as 13_2016.

The Curtin University Human Research Ethics Office approval number for this project is **HRE2017-0070**. Please use this number in all correspondence with the Curtin University Ethics Office regarding this project.

Approval is granted for a period of one year from **28-Feb-2017** to **27-Feb-2018**. Continuation of approval will be granted on an annual basis following submission of an annual report.

Personnel authorised to work on this project:

Name	Role
Gucciardi, Daniel	Supervisor
Brooke, Lauren Elizabeth	Student
Ntoumanis, Nikos	Supervisor

You must comply with the lead HREC's reporting requirements and conditions of approval. You must also:

- Keep the Curtin University Ethics Office informed of submissions to the lead HREC, and of the review outcomes for those submissions
- Conduct your research according to the approved proposal
- Report to the lead HREC anything that might warrant review of the ethics approval for the project

- Submit an annual progress report to the Curtin University Ethics Office on or before the anniversary of approval, and a completion report on completion of the project. These can be the same reports submitted to the lead HREC.
- Personnel working on this project must be adequately qualified by education, training and experience for their role, or supervised
- Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, that bears on this project
- Data and primary materials must be managed in accordance with the [Western Australian University Sector Disposal Authority \(WAUSDA\)](#) and the [Curtin University Research Data and Primary Materials policy](#)
- Where practicable, results of the research should be made available to the research participants in a timely and clear manner
- The Curtin University Ethics Office may conduct audits on a portion of approved projects.

This letter constitutes ethical approval only. This project may not proceed until you have met all of the Curtin University research governance requirements.

Should you have any queries regarding consideration of your project, please contact the Ethics Support Officer for your faculty or the Ethics Office at hrec@curtin.edu.au or on 9266 2784.

Yours sincerely

Professor Peter O'Leary
Chair, Human Research Ethics Committee

Appendix G: Ethical Approval

Ethical Approval for Chapter Five

Enhancing Functional Recovery for Young People Recovering from First Episode
Psychosis Via Sport-Based Life Skills Training: Outcomes of a Feasibility and Pilot
Study



Research Office at Curtin

GPO Box U1987
Perth Western Australia 6845

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Facsimile +61 8 9266 3793
Web research.curtin.edu.au

21-Nov-2018

Name: Daniel Gucciardi
Department/School: School of Physiotherapy and Exercise Science
Email: D.Gucciardi@curtin.edu.au

Dear Daniel Gucciardi

RE: Ethics approval
Approval number: HRE2018-0748

Thank you for submitting your application to the Human Research Ethics Office for the project **A Sport-Based Life Skills Intervention for First Episode Psychosis: a Pilot Study**.

Your application was reviewed by the Curtin University Human Research Ethics Committee at their meeting on **06-Nov-2018**.

The review outcome is: **Approved**.

Your proposal meets the requirements described in National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*.

Approval is granted for a period of one year from **21-Nov-2018** to **21-Nov-2019**. Continuation of approval will be granted on an annual basis following submission of an annual report.

Personnel authorised to work on this project:

Name	Role
Brooke, Lauren Elizabeth	Student
Gucciardi, Daniel	Supervisor
Brooke, Lauren Elizabeth	Student
Lin, Ashleigh	Supervisor
Ntoumanis, Nikos	Supervisor

Standard conditions of approval

1. Research must be conducted according to the approved proposal
2. Report in a timely manner anything that might warrant review of ethical approval of the project including:

- proposed changes to the approved proposal or conduct of the study
 - unanticipated problems that might affect continued ethical acceptability of the project
 - major deviations from the approved proposal and/or regulatory guidelines
 - serious adverse events
3. Amendments to the proposal must be approved by the Human Research Ethics Office before they are implemented (except where an amendment is undertaken to eliminate an immediate risk to participants)
 4. An annual progress report must be submitted to the Human Research Ethics Office on or before the anniversary of approval and a completion report submitted on completion of the project
 5. Personnel working on this project must be adequately qualified by education, training and experience for their role, or supervised
 6. Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, that bears on this project
 7. Changes to personnel working on this project must be reported to the Human Research Ethics Office
 8. Data and primary materials must be retained and stored in accordance with the [Western Australian University Sector Disposal Authority \(WAUSDA\)](#) and the [Curtin University Research Data and Primary Materials policy](#)
 9. Where practicable, results of the research should be made available to the research participants in a timely and clear manner
 10. Unless prohibited by contractual obligations, results of the research should be disseminated in a manner that will allow public scrutiny; the Human Research Ethics Office must be informed of any constraints on publication
 11. Ethics approval is dependent upon ongoing compliance of the research with the [Australian Code for the Responsible Conduct of Research](#), the [National Statement on Ethical Conduct in Human Research](#), applicable legal requirements, and with Curtin University policies, procedures and governance requirements
 12. The Human Research Ethics Office may conduct audits on a portion of approved projects.

Special Conditions of Approval

This letter constitutes ethical approval only. This project may not proceed until you have met all of the Curtin University research governance requirements.

Should you have any queries regarding consideration of your project, please contact the Ethics Support Officer for your faculty or the Ethics Office at hrec@curtin.edu.au or on 9266 2784.

Yours sincerely

Professor Peter O'Leary
Chair, Human Research Ethics Committee