Faculty of Health Sciences
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Understanding the Potential of Sport for Promoting Physical Activity and Psychological Well-Being in Middle-Aged and Older Adults

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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 acknowledgment 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 Curtin University Human Research Ethics Committee (EC00262), Approval Numbers HRE2020-0742 (Chapter 3) and HRE2021-0360 (Chapter 4).

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Date: 27/01/2023

Acknowledgement of Country

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Statement of Contributors

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The purpose of this statement is to detail the nature and extent of the intellectual contribution by the PhD Candidate, Hamsini Sivaramakrishnan, and all other co-authors of this study publication. Hamsini Sivaramakrishnan contributed to the conception and design of the study, led data collection, analysis, and interpretation, and manuscript writing. Professor Daniel Gucciardi contributed to data analysis and interpretation, and manuscript editing. Matthew McDonald contributed to data collection and manuscript editing. Associate Professor Eleanor Quested contributed to the conception and design of the study, data interpretation, and manuscript editing. Professor Nikos Ntoumanis contributed to the conception and design of the study, data interpretation, and manuscript writing. Professor Cecilie Thøgersen-Ntoumani and Dr Boris Cheval contributed to manuscript editing.

I affirm the details stated in the Statement of Contribution are true and correct.

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List of Abbreviations

Australian Institute for Health and Welfare ..... AIHW
Grading of Recommendations, Assessment, Development and Evaluations .....GRADE
Index of Relative Socio-Economic Advantage and Disadvantage ..... IRSAD
International Physical Activity Questionnaire – Short Form..... IPAQ-SF
Metabolic Equivalents ..... METs
Physical Activity Neighbourhood Environment Survey.....PANES
Preferred Reporting Items for Systematic Review and Meta-Analysis ..... PRISMA
Template for Intervention Description and Replication ..... TIDieR
World Health Organisation.....WHO

Thesis Abstract

Background: Insufficient physical activity is considered a global public health challenge. A majority of middle-aged and older adults are insufficiently active. Physical activity is associated with a wide range of physical, psychological, and social health benefits, while insufficient physical activity is associated with poor health. Participation in sport, a specific form of physical activity, is known to confer unique social benefits such as the provision of a social network and reduced loneliness. Sport may also be more appealing for those who may not be attracted to more traditional forms of exercise. A lack of appropriate sport opportunities that cater to the ageing adult demographic group has been frequently cited as a reason for inactivity. Hence, there is a growing need to identify novel ways to engage this age group in physical activity. Walking sport programmes could provide a means to engage inactive adults in team sports at a reduced level of cardiovascular intensity that may be achievable yet sufficient to experience the benefits associated with physical activity and sport participation. However, there is limited empirical evidence to support the implementation and delivery of appealing, feasible, and sustainable walking sport programmes.

Aim: The aim of this thesis was to understand the potential of sport (and specifically walking sport) programmes to promote health-enhancing physical activity and psychological well-being in middle-aged and older adults.

Methods: A systematic review and meta-analysis ($k = 25$) examined the psychosocial outcomes of sport participation for middle-aged and older adults using a three-level meta-analytic approach (Study 1, Chapter 2). Then, a qualitative study (Study 2, Chapter 3) and mixed-methods study (Study 3, Chapter 4) were conducted to understand the potential appeal, feasibility, and sustainability of walking sport programmes as a means to promote physical activity in middle-aged and older adults. Using one-to-one semi structured interviews, the

qualitative study focused on the experiences of key stakeholders (i.e., decision-makers, facilitators, and players; $n = 21$) involved in community-based walking sport programmes. Reflexive thematic analysis was used to analyse data inductively. An explanatory sequential mixed-methods approach (in two phases), guided by the social-ecological model, was applied in Study 3 (Chapter 4). In phase one, an online questionnaire was administered to middle-aged and older adults ($n = 282$). Hierarchical multiple linear regressions were used to identify significant predictors of intentions to participate in walking sports. In phase two, a subset of questionnaire respondents scoring in the top and bottom 10 percentile on intentions to participate in walking sports ($n = 17$) were interviewed. Deductive reflexive thematic analysis was used to contextualise the findings obtained in phase one.

Results: The findings of the systematic review and meta-analysis (Study 1) confirm the association between sport participation and psychosocial benefits ($g = .33$). Small to moderate associations were observed for social, positive psychological, perceived physical, and cognitive outcomes, but not for negative psychological outcomes. The findings of the qualitative study (Study 2) identified four key themes – 'A renewed lease of life', 'Navigating ageing stereotypes', 'Tension between organisational demands and players' needs', and 'Walking sport facilitators as catalysts of success'. These themes provided insight into aspects of acceptability, feasibility, and sustainability of walking sport programmes. The regression findings of the mixed-methods study (Study 3) highlighted that perceived health status, attitudes, subjective norms, and distance of venue were significant predictors of intentions. Subsequent qualitative analyses identified contextual considerations for implementing walking sport programmes in four themes – 'What's in a name? The need for attractive nomenclature',' Overcoming a fear of the unknown', 'Congruence between personal physical activity needs and sport offering', and 'Promoting achievability of the activity'. These themes highlighted the complexity in health promotion and that physical

activity interventions require consideration of the multitude of influences that may predict an individual's desire and ability to engage in a specific behaviour.

Conclusions: Overall, the findings of this thesis highlight the potential of sport (and specifically walking sport) as a means to promote physical activity behaviours and foster psychological well-being in ageing adults, and provide recommendations that can be applied towards generating future research, health promotion policy, and practice. Future research should consider conducting a pilot study, which would inform a full-scale trial of walking sport programmes, and subsequently, more rigorous trials would support scale up of walking sport programmes in the Australian context.

Chapter 1: Thesis Introduction

1.1 Ageing and Health

The world's population is rapidly ageing – the number of older adults is expected to double from 703 million in 2019 to 1.5 billion in 2050 (World Health Organisation; WHO, 2019). Ageing is a process involving the negotiation of several biological, psychological, and social changes (WHO, 2021). Typically, ageing is associated with declines in functioning and an increased risk of disease and frailty (National Institute on Aging, 2021). Some commonly reported challenges include poor physical health, and reductions in cognitive functioning and psychological well-being (Choi et al., 2019; Deary et al., 2009). Moreover, ageing adults tend to experience multiple health conditions simultaneously (WHO, 2021). A longitudinal study carried out over a five-year period noted that deterioration occurred at varied paces for different domains of health (Diehr et al., 2013). Specifically, aspects of physical functioning tended to decline more rapidly than mental health and quality of life (Diehr et al., 2013). Further, as a result of transitioning out of work and reduced social contact, 35 percent of ageing adults reported experiencing loneliness and a sense of social isolation (Blazer, 2020). Therefore, given the rapid pace of population ageing, it is important to consider approaches to support ageing adults in a manner that enables positive experiences (Kim et al., 2021).

"Healthy ageing" is defined as "the process of developing and maintaining functional ability that enables well-being in older age" (WHO, 2020, para. 3). This process involves promoting functional capabilities that would allow individuals to satisfy their needs, be physically mobile, build and maintain social connections, and contribute meaningfully to society (WHO, 2020). In Australia, the key risk factors linked with poor health in ageing adults pertain to lifestyle (e.g., insufficient physical activity, tobacco smoking, alcohol consumption; Australian Institute of Health and Welfare; AIHW, 2020). Equally, there is a wealth of evidence linking healthy ageing with behavioural determinants such as smoking

status, alcohol consumption, diet, and physical activity level (see Peel et al., 2005). Hence, to promote healthy ageing there is need for health-promoting interventions focused on modifying these identified lifestyle factors in middle-aged and older adults to encourage healthy lifestyles, longevity, and improved quality of life (Kaeberlein et al., 2015). However, it is important to emphasise that attributing healthy ageing outcomes solely to behavioural determinants is over simplistic; such views reinforce neo-liberal notions of health promotion that place the burden of health behaviour change on the individual (Gard et al., 2017). Instead, it is necessary to consider behaviours within contextual, social, and cultural determinants that may relate to inequity in health outcomes, and individual access to appropriate resources and health promotion initiatives.

1.2 Physical Activity in Ageing Adults

According to the WHO physical activity recommendations, to benefit health, adults (i.e., aged 18 years and older) should perform at least 150-300 minutes per week of moderate physical activity, at least 75-150 minutes per week of vigorous physical activity, or an equivalent combination of the two (Bull et al., 2020). Additionally, it is recommended that adults perform muscle strengthening exercises on two or more days per week (Bull et al., 2020). Adults are also encouraged to limit their sedentary time, and replace some sedentary time with physical activity of any intensity (including light physical activity; Bull et al., 2020). In addition to these requirements, older adults (i.e., aged 65 years and older) are encouraged to perform functional balance on three or more days per week to improve functional capacity and prevent falls (Bull et al., 2020). Adults failing to meet these recommendations are considered insufficiently active (Bull et al., 2020).

Insufficient physical activity has been identified as one of the top three risk factors associated with poor health (AIHW, 2020). For instance, physical inactivity is a primary cause of several chronic ailments such as type 2 diabetes, cardiovascular disease, and

osteoarthritis (Booth et al., 2012). On the other hand, physical activity is associated with wide-ranging benefits across physical, psychological and social aspects of health (Musich et al., 2017; Penedo & Dahn, 2005). Specifically, an umbrella review of 24 systematic reviews and meta-analyses found physically active older adults to be at a 22-34% lower risk of all-cause mortality and experience a 26-38% reduction in cognitive decline when compared with their inactive counterparts (Cunningham et al., 2020). When compared with inactive older adults, active older adults were also found to experience benefits such as an improved quality of life and healthier ageing (Cunningham et al., 2020). Evidence from eight cohort studies (drawn from Australia, USA, Mexico, Japan, South Korea, and Europe) over a 10-year period indicated that physical activity, and breaking up sedentary time, was associated with sustained health and functioning, thereby facilitating healthy ageing (Moreno-Agostino et al., 2020).

Globally, it has been noted that one-third of the population is insufficiently active (Hallal et al., 2012). Trends further suggest that the rate of insufficient activity increases with age; there is a significant reduction in physical activity in middle-age with up to 60% of adults aged 60 and older identified as being insufficiently active (Hallal et al., 2012). Specifically, in Australia, more than half of the adult population is insufficiently active, and this figure is over 70% for those aged 65 years or older (AIHW, 2020). Furthermore, sociodemographic (e.g., gender, wealth) and biomedical (e.g., arthritis, obesity) factors have been associated with physical (in)activity (Smith et al., 2015). Although levels of light physical activity may increase with age, moderate-vigorous physical activity levels decline, indicating that older adults may be replacing moderate-vigorous activity with lighter activity (Smith et al., 2015). Consequently, identifying and providing appropriate opportunities for increasing light-to-moderate physical activity, and encouraging participation of ageing adults may support primary prevention of chronic illness (Booth et al., 2012). However, insufficient

attention (and funding) has been provided to evaluating and scaling-up such physical activity initiatives – there remains a need to identify key stakeholders to recognise and address real-world implementation challenges, failing which, such initiatives may be unable to offer enduring opportunities for physical activity (DiPietro et al., 2020).

1.3 Sport Participation in Middle-Aged and Older Adults

Sport is a specific form of physical activity that entails physical exertion, focused on physical/motor skills governed by a set of rules, and involves competing against others (Eime et al., 2013). However, in line with overall physical activity trends, sport participation declines with age (Jenkin et al., 2017). Participating in sport, especially in team sports, may yield benefits beyond those of other types of physical activity – the social interaction involved in sport may provide a social network, conferring social benefits in line with team membership (Allender et al., 2006; Son & Dionigi, 2020). A systematic review of 30 studies found that, while physically active older adults generally valued improving health and fitness, older adults who participated in sport differed from those who participated in other forms of physical activity – sport participants also valued building/maintaining social connections in addition to improving health and fitness (Stenner et al., 2020). Competition, goal setting and achievement, and challenging age-related stereotypes were other key drivers of older adults' sport participation (Stenner et al., 2020).

Participation in recreational sport can yield a multitude of benefits for middle-aged and older adults. In terms of health and well-being outcomes, recreational football (soccer) is known to have benefits for physiological health, such as improved cardiovascular, metabolic, and musculoskeletal functioning (Krustrup et al., 2010; Luo et al., 2018; Milanović et al., 2019). In a narrative review, Krustrup et al. (2010) highlighted that, when compared with running and interval training, recreational soccer participation led to greater improvements in aerobic capacity, fat oxidation, muscle hypertrophy and bone mass. Subsequently, in a meta-

analysis of 13 articles based on five trials, Luo et al. (2018) found that, for middle-aged and older adults, recreational soccer participation was associated with enhanced cardiovascular functioning, body composition, lower limb muscle function, and strength outcomes. However, no differences were observed between recreational soccer and control groups for postural balance (Luo et al., 2018). In a meta-analysis of 31 randomised and matched controlled trials, Milanović et al. (2019) noted that, compared with non-active control groups, recreational soccer participation was linked with greater clinically-meaningful benefits for blood pressure, resting heart rate, and fat mass – these effects were independent of age and gender of participants. Further, recreational soccer provided physiological benefits comparable with other forms of physical activity such as Zumba and running (Milanović et al., 2019). Overall, these findings highlighted the broad-spectrum physical health benefits of sport participation for middle-aged and older adults, and that such benefits may be experienced following just 12 weeks of participation (Milanović et al., 2019). However, in their meta-analytic review, Luo et al. (2018) noted that studies lacked detail regarding programme compliance, indicating that there is limited understanding of long-term participation and the associated determinants and outcomes.

1.3.1 Psychosocial Outcomes

Narrative reviews indicate that sport participation is associated with psychological and social benefits such as improved mental health and well-being, and reduced depression and anxiety (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020). Eime et al. (2013) systematically reviewed the psychological and social benefits of sport participation for adults (ages ranged from 16 to 65 years; $k = 11$). They noted that sport participation may be associated with certain psychological and social benefits – the most commonly reported psychological outcomes were improved well-being and reduced stress, while social outcomes included improved social functioning and increased social support

(Eime et al., 2013). Subsequently, in an integrative review of 17 studies, Andersen et al. (2019) found that team sport participation was associated with a wide range of psychological and social benefits for adults (ages ranged from 16 to 89 years), including improved self-esteem, social support, sense of belonging, and social interaction. Further, when compared with individual sports, team sport participation may afford better psychological and social outcomes due to the accompanying team membership and social interaction involved in participation (Andersen et al., 2019; Eime et al., 2013). Qualitative findings suggested that the social and team membership aspects of team sport participation were instrumental in maintaining long-term participation (up to two years) in what was perceived as 'an enjoyable and meaningful activity' (Andersen et al., 2019, p. 846). Elsewhere, in two large-scale population surveys in the United States of America (N = 1,237,194) and Scotland (N = 19,842), when compared with other forms of physical activity (e.g., cycling, aerobic and gym activities), team sport participation was found to have a dose-response relationship with positive mental health outcomes (Chekroud et al., 2018; Hamer et al., 2009). Participation in team sports, and participation in any form of exercise (including sport) for a duration of 45 minutes, three to five times per week, was associated with a reduction in mental health issues (Chekroud et al., 2018). However, the foci of these above investigations were typically on the 'younger' end of the adulthood spectrum (i.e., the mean age of participants was generally under 50 years) and largely neglected older age groups.

Kim et al. (2020) systematically reviewed the psychological and social outcomes of sport participation for adults aged over 50 years (ages ranged from 50 to 95 years; k = 23). They highlighted that sport participation for this age group was associated with improved psychological and social outcomes such as life satisfaction, social belonging, self-esteem, and self-confidence (Kim et al., 2020). However, findings were inconclusive regarding the reduction of psychological distress and improvement of mood (Kim et al., 2020). Gayman et

al. (2017) systematically reviewed the psychosocial outcomes of sport participation, specifically for older adults (ages ranged from 65 to 92 years; $k = 10$). They found that, for older adults, sport participation was associated with social benefits, such as social support and an expanded social network, as well as cognitive benefits such as cognitive flexibility (Gayman et al., 2017). Furthermore, emotional and ageing-related benefits such as enjoyment, well-being, and coping with ageing were noted (Gayman et al., 2017). Overall, the benefits of sport participation identified in the literature were similar to those afforded by physical activity generally – improvements in objective measures of physical health, as well as enhanced cognitive functioning, quality of life, and healthy ageing. Yet, the research on sport participation identified some additional unique outcomes – an emphasis on social benefits highlighted the increased social support, belongingness, and social interaction associated with sport participation.

Based on qualitative findings, both Gayman et al. (2017) and Kim et al. (2020) argued that broad assumptions of positive outcomes pertaining to sport participation for older adults may be premature. Kim et al. (2020) cautioned that, although older adults who participate in sport may adapt to the ageing process and challenge stereotypes of ageing, such interpretations may ultimately lead to a social norm of physical activity and sport participation as a 'good' thing to do that could stigmatise inactive adults (p. 13). On the other hand, Gayman et al. (2017) indicated that sport participation was associated with negative social and emotional outcomes for older adults. Specifically, competitive sport participation may be a source of distress when performance results decline due to changes in physical and functional capability (Gayman et al., 2017). Older athletes also reported a perceived lack of support from family members particularly surrounding 'the appropriateness of sport participation later in life' (Gayman et al., 2017, p. 178).

Together, these findings highlight that in spite of the overwhelming majority of research emphasising the positive outcomes associated with sport participation for adults, for middle-aged and older adults, benefits may be tempered by some potential negative outcomes such as distress and a perceived lack of support. Middle-aged and older adults are a heterogenous group, and as such, generalising findings drawn from a broad adult population (including individuals aged 16 years and older) may be inappropriate. Instead, contextual factors, such as social support and proximity of sporting facilities, may provide vital clues to better understand the experience of sport participation specifically for ageing adults who experience several unique competing responsibilities and changes including (grand)parenting, retirement and/or remaining in paid employment, and pursuing other interests. Unique environmental factors, spanning the physical and social environment may also contribute to the quality of the experience of sport participation for this age group. For instance, the appropriateness and accessibility of sport opportunities specifically aimed at ageing adults may determine an individual's ability and desire to engage in sport. Furthermore, as postulated by Self-Determination Theory (Ntoumanis et al., 2021; Ryan & Deci, 2017), the degree to which the social environment within and outside the sport context (i.e., the non-physical aspects of the environment created by what people in the setting say or do) is able to satisfy participants' basic psychological needs of autonomy, competence, and relatedness contributes to ageing adults' experiences of positive and/or negative outcomes. However, such social, structural, and policy aspects remain underresearched in the context of physical activity in ageing adults (Biddle et al., 2022). Therefore, there is a need for future research to examine experiences pertaining to sport participation among ageing adults in context, to understand the contributing factors associated with positive and negative experiences.

1.4 The Social-Ecological Model: Determinants of Physical Activity and Sport Participation in Ageing Adults

In spite of the varied benefits of physical activity, as previously highlighted, a majority of ageing adults are insufficiently active. Several variables are known to influence adults' physical activity or lack thereof. The social-ecological model provides a framework to understand the complexities of individuals' behaviour within the context of their unique environment (Sallis et al., 2006). This model considers the interrelations between various nested social-ecological (i.e., personal, psychosocial, environment, organisational, and policy) levels with regards to a specific behaviour (King & Gonzalez, 2018). In the context of physical activity, the social-ecological model has been used to identify determinants of participation (King & Gonzalez, 2018). Specifically, in relation to middle-aged and older adults' participation in physical activity, social-ecological determinants, spanning personal, psychosocial, environmental, organisational, and policy domains, have been noted. In order to encourage physical activity participation for this age group, identified social-ecological barriers may need to be addressed (Jenkin, Eime, et al., 2018).

At a personal (or demographic) level, a narrative review of the correlates of physical activity identified that factors such as age and weight were inversely associated with physical activity, while health status, prior history of physical activity, and intentions to be physically active were directly associated with adults' physical activity (Bauman et al., 2012). A cross-sectional study also identified gender, age, body mass index, and perceived health as key personal predictors of older adults' physical activity (Thøgersen-Ntoumani, 2009). In their qualitative investigation of community-dwelling adults, Boulton et al. (2017) found that ageing adults who saw themselves as capable of participating in an activity, led fairly active lifestyles, and perceived physical and mental health benefits were more likely to engage in physical activity.

In relation to sport participation, a narrative systematic review identified that several individual-level determinants, such as prior sport history, health, and socio-demographic factors were implicated in sport participation for older adults (Jenkin et al., 2017). Further qualitative findings indicated that the most commonly reported personal barrier to sport participation for adults aged over 50 years was physical health (Jenkin, Eime, et al., 2018). Although enhanced physical health was a key outcome of sport participation (e.g., Milanovic et al., 2019), such activities may also increase the risk of injury, a risk that may be further exacerbated by age, thereby limiting the capacity of ageing adults to participate in sports (Jenkin, Eime, et al., 2018).

At a psychosocial level, factors such as intrinsic motivation and self-efficacy, were identified as strong predictors of physical activity behaviours for ageing adults (Lee et al., 2020; White et al., 2012). In a longitudinal study over a 10-year period, aspects of the social environment were also identified as predictors of physical activity engagement in ageing adults – individuals experiencing social support specific to physical activity were more likely to be physically active (Smith et al., 2015). Similarly, mobilising social support and social norms, and encouraging socialising within an activity was found to encourage participation, particularly among ethnic minority populations (Boulton et al., 2017; Fleury et al., 2006). In the context of sport participation, time constraints and competing priorities were key participation barriers for ageing adults, whereby the changing social roles resulting from ageing (e.g., having children, caring for relatives, retirement) posed a challenge to incorporating sport into their busy lives (Jenkin, Eime, et al., 2018; Jenkin et al., 2016). Perceived societal expectation has also been found to be a barrier – sport tends to be viewed as being intended for younger age groups, and therefore ageing adults may view their involvement in such activities as inappropriate (Jenkin, Eime, et al., 2018).

At an environmental level, aspects of the neighbourhood such as walkability, traffic and safety were found to determine participation in community-based physical activity options (Bauman et al., 2012; Thøgersen-Ntoumani, 2009). Proximity, accessibility, and flexibility of the activity (i.e., a drop-in approach with no pressure to commit to participation for a specific period of time) were relevant predictors of physical activity engagement for ageing adults – yet it is unclear whether modifying these aspects would encourage uptake of physical activity that is sufficient to reap health benefits (Bauman et al., 2012; Boulton et al., 2017). In relation to physical activity and sport, lack of affordability, whether in terms of equipment or club membership fees, was an important participation barrier (Boulton et al., 2017; Jenkin, Eime, et al., 2018). Notably, in a cross-sectional epidemiological study (n = 2199), aspects of the perceived environment and surroundings (e.g., perceived aesthetics, pedestrian-friendly street design) were linked with adults' physical activity levels even after controlling for demographic and psychosocial factors (Saelens et al., 2012).

At an organisational level, qualitative research exploring benefits and barriers of sport participation for adults aged over 50 years identified a lack of awareness of, and accessibility to, appropriate playing opportunities as key barriers for this age group (Jenkin, Eime, et al., 2018). When compared with younger age groups, there were generally fewer sport opportunities, particularly those in close proximity, with appropriate facilities that catered for senior-ages (Jenkin, Eime, et al., 2018). Furthermore, organisational challenges have meant that the sport programmes were limited in their capacity to cater to varied demographic groups (e.g., gender, age, physical activity level). At a policy level, sustainability of the physical activity/sport offering was a key determinant – in Australia, sport organisations reported a tendency to adopt a strategic focus on (younger and elite athlete) demographics that may be more engaged in sports (Jenkin et al., 2021). Moreover, sport organisations highlighted that risk management and concerns about additional resources to support ageing

adults' unique participation needs were challenging barriers to overcome (Jenkin, Eime, et al., 2018). In order to encourage physical activity behaviour, the focus of sport organisations should be directed towards providing age-appropriate sport opportunities, with an emphasis on social interaction (Jenkin et al., 2021).

Although these findings highlight that numerous factors at different social-ecological levels (i.e., personal, psychosocial, environmental, organisational, and policy levels) may be implicated in physical activity and sport participation, it is important to highlight that a majority of the literature reviewed above (e.g., Bauman et al., 2012; Boulton et al., 2017; Fleury et al., 2006; Jenkin, Eime, et al., 2018; Saelens et al., 2012) is drawn from participants from the Western world (e.g., North America, Europe, Australia). However, there are notable cultural differences in ageing adults' perceived enablers and barriers to physical activity ranging from knowledge of physical activity to the built environment (e.g., Mathews et al., 2010). As such, the generalisability of these findings across cultures may be limited.

Together, the evidence summarised above pertaining to the social-ecological model suggests that in order to facilitate physical activity in ageing adults, it is imperative to consider, not just the individual, but equally, the broader social and environmental factors that may influence participation. A social-ecological approach would enable the predictors of sport participation at different levels to be identified and, subsequently, examined in further detail and addressed as appropriate.

1.5 Self-Determination Theory in Physical Activity and Sport Participation

Self-determination theory (Ryan & Deci, 2000) is a theory of human motivation that has been extensively applied in the physical activity context. Self-determination theory emphasizes the importance of satisfaction of three basic psychological needs – autonomy (the perception of ownership over one's behaviour), competence (experiencing mastery and desired outcomes), and relatedness (feelings of connected to others; Ryan & Deci, 2017).

Engagement in behaviour for self-determined reasons and experiences of psychological well-being depends on the degree to which the three basic psychological needs are satisfied or thwarted (Ryan & Deci, 2000). Self-determination theory distinguishes between autonomous and controlled forms of motivation – autonomous motivation tends to arise from intrinsic sources including identifying with the value of the activity and alignment with sense of self while controlled motivation tends to stem from external sources such as the desire to earn rewards or avoid punishment (Ryan & Deci, 2017).

A growing body of research has explored aspects of the social environment that can nurture or undermine the satisfaction of these three basic psychological needs and their implications for motivation, behavioural engagement, and well-being. For instance, in the health context, interventions informed by self-determination theory, that foster need satisfaction and autonomous forms of motivation, have demonstrated a positive impact on health behaviour and a variety of health indices encompassing physical and psychological health (Ntoumanis et al., 2021). Motivationally supportive environments (i.e., environments that foster autonomous rather than controlled motives by satisfying the basic psychological needs) are also found to positively predict long-term physical activity engagement (Teixeira et al., 2012). Hence, more recently, research has examined the importance of need-supportive motivational strategies and communication styles within physical activity settings (e.g., Hancox et al., 2018). Interpersonal styles adopted by significant others (e.g., instructors, family members) within and outside of the physical activity context can influence an individual's quality of motivation to engage with and maintain participation in the activity – need-supportive interpersonal communication styles of others can foster basic psychological need satisfaction and autonomous forms of motivation for physical activity (Ntoumanis et al., 2017). The theory and associated evidence have highlighted the importance of not merely participating in physical activity programmes, but doing so within motivationally-supportive

environments. The studies presented in this thesis reflect on the relevance of self-determination theory to sport programmes aimed at promoting physical activity and psychological well-being in middle-aged and older adults.

1.6 Sport Programmes for Ageing Adults

When discussing sport programmes that cater to ageing adults, it is important to first consider the evolving normative connotations associated with sport participation for this age group (Dionigi, 2015). Until recently, ageing was predominantly viewed as being associated with functional decline (Dionigi, 2015). Consequently, sport participation was considered unsafe, unnecessary, and inappropriate for ageing adults (Dionigi, 2015). However, Dionigi (2015) argued the importance of contemporary perspectives of sport participation in ageing adults, highlighting a shift in ageing discourses aligned with the surge in "active ageing" policies. In the past decade, several lines of research refute the perception of ageing as strictly a period of decline, and instead, highlight the heterogeneity in ageing adults' experiences in the context of health, physical activity, and sport participation (e.g., Ferrucci & Kuchel, 2021; Nguyen et al., 2020; Phoenix & Smith, 2011). Compatibly, there has been an increase in the availability of structured sport programmes for ageing adults (Dionigi, 2015).

The majority of the research concerning sport participation by ageing adults has focused on competitive and elite forms of sport, such as Masters Sport and Senior Games (Jenkin et al., 2017; Stenner et al., 2020). Masters Sports emerged in the 1960s as a means to provide competitive sport opportunities for athletes who were "past their prime" (Weir et al., 2009, p. 8). These events rapidly gained popularity and expanded to national and international levels; at present, a wide range of competitive opportunities are available for ageing adults across a variety of team (e.g., soccer, hockey) and individual (e.g., track and field, swimming) sports (Weir et al., 2009). In their qualitative work with Masters athletes, Dionigi (2009) indicated that participation in Masters Sport was regarded as a means to adapt

to, avoid, or accept the ageing process. For some athletes, such participation in competitive sport enabled the development of a positive ageing identity associated with a sense of achievement and empowerment (Dionigi, 2009). Meanwhile, for others, Masters Sport participation was motivated by a desire to avoid age-related decline (Dionigi, 2009). In either case, for those who identified as competitive and physically active, participation in Masters Sport permitted the experience of identity continuity, and consequently, the perception of healthy ageing (Dionigi, 2009). Nonetheless, in a narrative review, Baker et al. (2010) recognised that competitive sport participation could also present negative consequences for ageing adults – the desire to resist the ageing process may be associated with denial and avoidance, which may actually be problematic in relation to the development of a positive ageing identity (Baker et al., 2010).

Contrasting the expansion of Masters Sports (that provide competitive sport opportunities for ageing adults), there are limited community-based sport options for this age group. As previously noted, there is notable heterogeneity in ageing adults' experiences of, and preferences for, different forms of physical activity (e.g., Phoenix & Smith, 2011). As such, there is a need for sport opportunities that cater to the needs of ageing adults who may prefer recreational, non-competitive forms of sport. Yet, insufficient consideration has been dedicated to implementation of appropriate recreational and non-competitive forms of sport targeted towards ageing adults. As previously mentioned, there are certain structural factors that explain the improper attention given to such form of sport: organisational and policy barriers include the perceptions of low profitability of community-based sport programmes, and prioritisation of youth and elite sports (Jenkin et al., 2016). Hence, there is a need to acknowledge and appraise how ageing adults negotiate such organisational constraints in the process of sport participation (Jenkin et al., 2021).

In the United Kingdom, “Back to Netball” programmes were implemented with the intention of filling the void in appropriate community-based recreational netball participation opportunities for middle-aged and older adults (England Netball, 2019). Delivered over a 12-week period, these community-based programmes aimed to (re)introduce women to netball and typically involved female coaches delivering sessions on sport-specific skills with the option for participants to progress to competitive games (England Netball, 2019). “Back to Netball” could be tailored to participants individual physical activity needs and developed on a large scale. Assessments of programme outcomes based on cross-sectional self-report data collected via an end-of-programme survey indicated that the majority of participants experienced physical (97%), mental (76%), and social (86%) well-being (England Netball, 2016). However, baseline data were not collected, and therefore, longitudinal changes in the experience of well-being and the extent to which well-being can be attributed to programme participation remain unclear. Furthermore, 89% of “Back to Netball” participants continued to engage in physical activity even when the programme had concluded (England Netball, 2016). “Back to Netball” has been successful in catering to the needs of a particularly hard to reach group, mothers (Walsh et al., 2018). Although, initially, participants had extrinsic motives for participation (e.g., weight loss), over the course of the program, more intrinsic motives (e.g., enjoyment) developed (Whitehead et al., 2019). Participation in “Back to Netball” instilled a sense of relatedness among participants and competence for netball participation; this enabled the development of a generic exercise identity and long-term maintenance of physical activity (Whitehead et al., 2019). The social identity fostered through such participation was associated with enhanced self-esteem and self-efficacy for health behaviours (Walsh et al., 2018). Therefore, providing appropriate opportunities for sport participation may not only increase long-term engagement in physical activity, but also cultivate a sense of empowerment and well-being (Walsh et al., 2018). However, it is unclear

the extent to which these findings may represent the experiences of ageing adults more broadly; there is limited evidence that reports on the long-term engagement in sport specifically for middle-aged and older adults.

A recent systematic review by Jenkin et al. (2017) highlighted that although sport dropout rates increased exponentially with age, sport policies advocating for "Sport for All" have been valuable in encouraging sport participation in ageing adults. Nonetheless, re-engaging ageing adults has been a challenge several sport organisations have struggled to overcome (Jenkin et al., 2021). While there may be some overlapping participation determinants across the lifespan (e.g., accessibility, safety), ageing adults may encounter certain unique barriers (such as those associated with negotiating the ageing process and social-ecological predictors as highlighted previously; Jenkin et al., 2017). However, current physical activity (and sport) offerings fail to consider the social determinants associated with adoption and maintenance of participation (DiPietro et al., 2020). As such, there is a need to explore ageing adults' requirements and preferences to deliver appropriate and suitable community-based sport opportunities for ageing adults.

1.7 The Expansion of Walking Sports

Adapted forms of sport have recently emerged as a means to cater to the needs of individuals 'who require adaptation for participation in the context of physical activity' (Carlier et al., 2016, p. 351). Walking sports are specifically adapted such that participants replace the running element of traditional sports (e.g., soccer, netball) with walking in order to lessen the cardiovascular demands of playing the game (Reddy et al., 2017). Further, in addition to being low-impact, walking sports are adapted to be non-contact in nature, significantly reducing the risk of injury (Reddy et al., 2017). It has been noted that older adults prefer participating in sports, such as golf, that are considered "physically appropriate" (p. 531) due to the low physical demands of participation that may be better suited to their

physical capability (Stenner et al., 2020). Consequently, walking sports may be particularly attractive to a less-mobile, older demographic, who may wish to be physically active and participate in sport, but are unable to meet the physical demands of traditional sports (Reddy et al., 2017).

At present, walking versions of soccer, netball, hockey, and basketball are offered at local sports clubs across the globe. Notably, walking soccer is the most widespread of these sports, with a large prevalence across Europe, and over 40,000 regular participants across 1000 participating clubs in England alone (Corepal et al., 2020). A recent report highlighted that, in England, over 3000 women participated in walking netball across over 150 programmes conducted in partnership with the National Federation of Women's Institutes (England Netball, 2021). More recently, there has been a budding presence of walking soccer in parts of Asia, South Africa, and Australia (Corepal et al., 2020).

In Australia, walking netball was first introduced in 2017 by Netball New South Wales, in an attempt to reduce sport participation barriers for seniors via delivery in a format that caters to varied fitness levels and ability. Such programmes were anticipated to provide a safe environment to practice sport-specific motor skills, while facilitating social interaction (Walking Netball New South Wales, n.d.). Shortly after, walking soccer was first launched by the Football Federation of Australia in 2019, in partnership with Sport Australia and Active Ageing Australia, in an attempt to encourage sport participation among middle-aged and older adults. This programme was aimed at less-mobile individuals, allowing participants to experience improvements in health and well-being within a socially connected environment (Football Australia, n.d.). Walking basketball and walking hockey programmes have also been trialled on a small-scale in some parts of Australia (Hockey Western Australia, n.d.; Jenkin, Hilland, & Eime, 2018). However, there is limited evidence pertaining to the uptake, acceptability, feasibility, and sustainability of these programmes in the Australian context.

In Europe, mainly the United Kingdom, research has considered the acceptability, feasibility, and outcomes of walking sport participation, primarily in the context of walking soccer. Walking soccer is considered a moderate-vigorous physical activity, with an average rating of perceived exertion of 13 (on a scale of 6 to 20, considered to be a moderate level of intensity), and an average increase in blood lactate of 157% from pre-session to post-session (indicative of a moderate level of intensity; Harper et al., 2019). When compared with walking, walking soccer participation was found to be of higher intensity, and resulted in higher heart rates and greater distance covered for a specified duration of time; however, this was less than the intensity, heart rate, and distance covered while playing traditional running soccer (Larsen et al., 2017; Madsen et al., 2021). As such, given that (as previously noted) older adults may replace moderate-vigorous activity with lighter activity (Smith et al., 2015), walking sport participation may provide a means for those ageing adults who are unable to meet the demands of traditional sports to engage in moderate-vigorous physical activity. Pilot studies investigating the experiences, sustainability, and benefits of walking soccer programmes in the United Kingdom have found that such forms of sport were engaging and enjoyable for older men, aged over 50 years (Reddy et al., 2017). Pilot walking soccer programmes demonstrated high participant retention rates of approximately 68 percent, indicating that these programmes were feasible and acceptable to males aged over 50 years, and sustainable to conduct in a community-based setting (McEwan et al., 2018). However, these pilot studies (McEwan et al., 2018; Reddy et al., 2017) have investigated small sample sizes with a short intervention duration, and as such, generalisability of findings may be premature.

In order to understand the uptake of walking sport programmes, Cholerton et al. (2019) interviewed ageing adults who had participated in walking soccer for a minimum of six months – this study required participants to retrospectively recall their initial experiences

with walking soccer and factors that influenced their participation. Prior to engagement in walking soccer, the key influences pertaining to walking soccer participation for 55- to 75-year-olds were values and perceptions of walking sport, prior sport experience, awareness of walking sport, and self-efficacy (Cholerton et al., 2019). However, perceived physical ability, negative social influences, prior commitments, and accessibility of the sport may have delayed participation (Cholerton et al., 2019). Subsequently, during the initiation process (i.e., first six months of participation), physical health, mental adaptations, social interactions were highlighted as being vital (Cholerton et al., 2019). Contrastingly, negative experiences, involving poor social relations, physical inability, perceived mental barriers, and club-specific restraints, were described as participation deterrents (Cholerton et al., 2019). However, this study required participants to retrospectively recall their initial experiences of walking soccer participation, which may be subject to recall bias.

In the context of walking soccer, Cholerton et al. (2021) explored participants' experiences in relation to maintenance of walking soccer participation (i.e., participating for more than 6 months). Their qualitative findings indicated that perceived participation benefits, sport identity, and values related to physical activity were pertinent individual factors related to sustained participation in walking soccer programmes (Cholerton et al., 2021). Social factors relating to maintenance of walking soccer participation included positive influences within, as well as outside of, the walking soccer environment (Cholerton et al., 2021). In promoting social contact, the social links established through team membership were deemed instrumental in attracting long-term engagement within walking soccer programmes (McEwan et al., 2018). Additionally, logistical factors, as well as the walking soccer culture and coach characteristics were also noted as essential to maintenance of walking soccer participation (Cholerton et al., 2021). In terms of maintenance resources, affect, cognitions, and behaviours relating to walking soccer participation were deemed

crucial to long-term maintenance (Cholerton et al., 2021). However, these findings may be limited to the experiences of those who sustained participation in walking soccer – little is known about the experiences of dropouts and factors that may be implicated in (or would have mitigated) dropout from walking soccer, and whether these findings can be generalised to other walking sports.

Kinnafick et al. (2021) conducted a large-scale evaluation of walking netball programmes delivered in the United Kingdom by England Netball in partnership with the National Federation of Women's Institutes. Their investigation demonstrated that successful adoption of walking netball programmes could be attributed to the participatory approach to programme implementation, which allowed for adapting the programme to suit the specific characteristics and needs of those attending a certain location (Kinnafick et al., 2021). Hosts of these walking netball programmes (i.e., individuals responsible for leading and delivering sessions) described a range of intrapersonal (e.g., participants' health, physical capability), interpersonal (e.g., hosts' leadership initiative, support network), and environmental (e.g., organisational demands, identifying suitable facilities) factors associated with acceptability and feasibility of walking netball programmes. However, these findings may be limited to the context of walking netball programmes in the United Kingdom – little is known about the extent to which these experiences might be shared by participants and hosts of other walking sport programmes. Further, research has largely neglected the perspectives of the various stakeholders involved in implementation of community-based walking sport programmes, such as decision-makers within national and state sport organisations. Understanding these different perspectives would provide a holistic understanding that may be especially important to ascertain how to improve the long-term viability, and inform policy regarding future implementation, of such programmes.

1.8 Outcomes of Walking Sport Participation

Recent investigations have considered the physical, psychological, and social outcomes of participating in walking sports – a vast majority of this body of work has focused specifically on walking soccer. In terms of participation outcomes, Arnold et al. (2015) suggested that a 12-week walking soccer programme may have a positive impact on physiological indices of health for participants between 50 and 65 years of age; these benefits included reduced body fat mass and percentage, and an increase in time to volitional exhaustion during exercise. However, this research did not include a control group, and failed to account for extraneous variables such as changes in nutrition and lifestyle activity, which may have had an impact on the findings. For a population of Southeast Asian women, competitive walking soccer was considered to be of sufficient intensity to foster improvements in cardiovascular and metabolic fitness (Heil et al., 2018). However, the long-term physiological outcomes of walking soccer participation are unknown. In addition, a narrative systematic review suggested that walking soccer participation had a positive association with social and well-being outcomes (Corepal et al., 2020). In a pilot study, compared with baseline data, modest increases were noted post-programme on measures of mental well-being and social support (McEwan et al., 2018). However, this was comparable with increases noted for the waitlist control group and the small sample size (n = 16) meant that the data was underpowered to detect statistical significance. Furthermore, the long-term effects on health and well-being remain largely unclear (Harper et al., 2019; Reddy et al., 2017).

In spite of the lack of statistical evidence, qualitative inquiries exploring the experiences of walking sport participants' have noted several psychosocial participation benefits (Cholerton et al., 2019; Cholerton et al., 2021; Loadman, 2019; Taylor & Pringle, 2021). Interviews with males aged over 50 who participated in a pilot study noted that

participating in walking soccer gave them something to look forward to each week (McEwan et al., 2018). The social interaction involved in such programmes was particularly enjoyable as it allowed participants to expand their social circle (McEwan et al., 2018). An ethnographic study noted that, although associated with toughness and aggression of competitive sport, participation in recreational walking soccer was associated with community bonding, which was particularly important to older adults' health and well-being (Loadman, 2019). Several intangible benefits such as social integration, engagement, enjoyment, and positivity in life were also discussed (Loadman, 2019). Equally, in addition to improvements in physical functioning and self-reported physical activity behaviour, walking netball participation was associated with enhanced quality of life, and psychological and social well-being (Kinnafick et al., 2021). In walking netball programmes, the social environment, specifically the collaborative identity held by participants and the inclusive programme environment, was a key motivating factor for older women (Mulvenna & Leslie-Walker, 2021). Yet, these qualitative investigations have solely focused on the perspectives of participants – the experiences of other key stakeholders such as individuals responsible for implementation and delivery have been largely neglected. In order to obtain a complete picture, particularly regarding feasibility and sustainability of walking sports, it is important to include perspectives of personnel involved with the implementation and delivery of walking sports.

Walking soccer was noted to aid individuals with mental health diagnoses in their recovery (Lamont et al, 2017). Participants with diagnosed mental health conditions attributed physical health benefits, such as weight loss and improved fitness, as well as mental health benefits, such as providing a purpose in life and serving as a distraction from mental health concerns, to their involvement in walking soccer (Lamont et al., 2017). For 50- to 75-year-old participants with multiple health conditions, social interactions were noted to

be particularly important for the initiation and maintenance of walking soccer participation (Cholerton et al., 2021). However, these findings may be limited by the cross-sectional design involving (potentially biased) retrospective recall that limits interpretation of causal inferences. For middle-aged men experiencing mental health concerns, walking soccer provided an outlet to discuss their personal issues with a group of likeminded people (Taylor & Pringle, 2021). The inclusive environment that was cultivated within the programme enabled participants to experience improvements in their mental health and well-being (Taylor & Pringle, 2021). For people living with dementia, participating in walking soccer provided a feeling of pride associated with achievement and improved their mood, while the physical exertion involved improved their quality of sleep (MacRae et al., 2020). Furthermore, for these individuals, participating in a team cultivated a sense of belongingness, and facilitated social interaction, among participants (MacRae et al., 2020).

However, approximately 80 percent of the sample ($N = 25$) recruited by Lamont et al. (2017), and nearly 90 percent of the sample ($N = 439$) surveyed by Cholerton et al. (2021) comprised of male soccer participants and staff members. MacRae et al. (2020) and Taylor and Pringle (2021) solely recruited male walking soccer participants. Together, these findings provide limited insight into the extent to which these experiences are shared by female participants (who are currently underrepresented in the literature and in walking soccer programmes; Corepal et al., 2020). Given the recent push to actively encourage females to participate in walking soccer (The Walking Football Association, n.d.), there is a need for future research to consider female participants' perspectives.

1.9 Gaps in the Evidence

There is a growing emphasis on increasing physical activity among middle-aged and older adults, and sport presents an opportunity that may help achieve this aim (Baker et al., 2010). Although reviews have highlighted the multi-faceted benefits of sport participation for

ageing adults, these findings are limited in their scope due to their narrative nature. These existing reviews have highlighted that sport participation may confer psychological and social benefits for participants. Yet, the magnitude and heterogeneity of these effects remain largely unclear. Additionally, objective understanding of potential moderators that may explain the association between sport participation and psychosocial outcomes for this age group is limited.

Given the problem of insufficient physical activity in ageing adults, there is a need to consider the potential of novel and adapted forms of sport, such as walking sports, to promote physical activity. Such forms of sport could potentially cater to the physical activity needs of a segment of the population that may not wish to participate in traditional sports, and instead may desire to participate (and could benefit from participating) in low-impact and non-contact team sports. Existing research has focused on the experiences of walking sport participants, and noted that such programmes may be feasible to conduct, and participation may provide some social and health-related benefits (Corepal et al., 2020; Kinnafick et al., 2021; McEwan et al., 2018). However, thus far, walking sport programmes have been implemented without sufficient consideration of the appeal of walking sports, or why ageing adults may wish to engage in such forms of community-based sport participation. This limits the feasibility and sustainability of walking sport programmes, highlighting two key gaps that need to be addressed. Firstly, there remains a need for multi-stakeholder research that simultaneously considers the needs of, and challenges faced by, varied stakeholders (i.e., organisational decision-makers, programme facilitators, and participants). This would ensure that, while encouraging walking sport participation, potentially diverse perspectives can be taken into account and addressed appropriately, to the extent possible. Secondly, there is limited research concerning the potential appeal of such sports to middle-aged and older adults (i.e., the typical target group for walking sport programmes). This restricts the

likelihood of expanding the walking sport offering to potential participants (i.e., individuals who fit the target group but have not previously participated in walking sports) in a manner that is attractive and engaging. Adopting a social-ecological approach, investigating the interplay of various personal, psychosocial, environmental, organisational, and policy level factors, would highlight the facets at different levels that would need to be targeted to promote the uptake of walking sport programmes in a community-based setting. Taken together, these findings could inform the expansion of walking sport programmes in a manner that is acceptable to both existing and potential participants, while highlighting important organisational considerations for feasibility and sustainability. Encouraging walking sport participation would promote moderate-vigorous physical activity behaviour, bolstering public health efforts to address the problem of insufficient physical activity in ageing adults, and may ultimately contribute to long-term health benefits and the primary prevention of disease.

1.10 Overview of Thesis, Philosophical Positioning, and Significance

The present thesis aims to address the identified gaps in the literature concerning the potential of sport for promoting physical activity and psychological well-being in middle-aged and older adults. In order to achieve this overarching aim, three studies were conducted. The philosophical positioning of this thesis stemmed from the involvement and collaboration between a disparate group of researchers having varied expertise in methodologies and methods. While some researchers operated from a constructivist paradigm, others adopted experimental, hypothesis driven, positivist beliefs. In coming together, it was agreed that while these world views may be incompatible, each of these perspectives played a vital role in addressing the identified gaps in the literature and enabling a comprehensive understanding of the topics under investigation. Hence, the shift in positioning and language used within each presented study is not an absent-minded switching between incompatible philosophical assumption, but rather a conscious settling of paradigms that may be most relevant to

addressing a specific research question. Through regular discussion and reflection within the research team, this settling was attained through the practice of agonistic pluralism, where the intent was to acknowledge differences rather than achieve consensus (Mouffe, 2000).

Chapter 2 (Study 1) presents a systematic review and meta-analysis of the psychosocial outcomes of sport participation for middle-aged and older adults. In seeking an objective understanding of the association between sport participation and psychosocial outcomes, this study is framed by a positivist philosophical positioning. Extending the findings of existing narrative systematic reviews (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020), this is the first meta-analysis on the topic, and considers the magnitude and heterogeneity of the association between sport participation and psychosocial outcomes, as well as the relevance of sport- and participant-related moderators of participation for middle-aged and older adults.

Chapters 3 and 4 focus on the potential of walking sports, a specific type of adapted sports, for promoting physical activity and psychological well-being for middle-aged and older adults. Chapter 3 (Study 2) presents a multi-stakeholder qualitative exploration of community-based walking sport programmes in Australia. This chapter explores the experiences of key stakeholders (i.e., decision-makers, programme facilitators, and participants) involved in walking sport programmes in Australia. This study is the first to consider diverse perspectives of various stakeholders involved, in order to understand the appeal, feasibility, and sustainability of these types of programmes. In seeking to understand and interpret meaning of walking sport experiences, this study is framed by a constructivist philosophical positioning. Chapter 4 (Study 3) presents a mixed-methods investigation of the potential appeal of community-based walking sport programmes for middle-aged and older adults. This chapter assesses the influence of social-ecological (i.e., personal, psychosocial, programme-related, and environmental) predictors of, and explores why certain predictors

may be particularly relevant to, middle-aged and older adults' intentions to participate in walking sports. This is the first study to consider the perspective of potential walking sport participants (i.e., individuals who fit the target population, but have no prior experience with the sport). In seeking to combine multiple methods and sources of evidence to improve understanding of walking sports, this study is framed by a post-positivist philosophical positioning. Chapter 5 presents a discussion of the findings of the studies included in this thesis and their implications, particularly in terms of implementation of future walking sport programmes, while highlighting avenues for future research. Given the growing popularity of walking sport programmes worldwide, the present thesis provides insight into the facets that may warrant consideration for successful implementation of future walking sport programmes in a manner that is appealing, feasible, and sustainable in the long-term. The findings of this thesis serve to address the problem of insufficient physical activity, the need for appropriate community-based sport opportunities for ageing adults, and support the budding efforts to encourage physical activity and promoting health in ageing adults.

Chapter 2: Psychosocial outcomes of sport participation for middle-aged and older adults: A systematic review and meta-analysis

Note: The following chapter has been published in the International Review of Sport and Exercise Psychology

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2.1 Introduction

With the rapid pace of ageing of the world's population (WHO, 2019), there is a need to understand approaches that could foster positive experiences of individuals later in life (Kim et al., 2021). Ageing is defined as a process associated with 'declines in function of the senses and activities of daily life and increased susceptibility to and frequency of disease, frailty, or disability' (National Institute on Aging, n.d.). As such, this can bring many challenges such as the deterioration of cognitive ability and well-being, and increased risk of physical and mental ailments (Choi et al., 2019; Deary et al., 2009). Physical activity is defined as any bodily movement (structured or unstructured) that leads to the expenditure of energy (Eime et al., 2013). Across all age groups, physical activity has widespread benefits, spanning the physical, psychological, and social domains of health (Penedo & Dahn, 2005). Sport participation, which refers to a subset of physical activity, is defined as partaking in a specific form of physical activity requiring physical exertion, in which actions are governed by a set of rules, focusing on the development of physical/motor skills, and competing against other individuals or teams (Eime et al., 2013). Sport participation, particularly in team settings, can confer some additional benefits, over and above those derived from some types of physical activity, such as providing a social support network (Allender et al., 2006; Dionigi, 2005; Dionigi et al., 2011; Roper et al., 2003; Son & Dionigi, 2020). Recently, numerous sport-based programmes are being developed and targeted towards middle-aged and older adults (Heo et al., 2018; Holt et al., 2009).

Several meta-analyses have shown that recreational football (soccer) is a health-promoting activity with broad-spectrum benefits, including improvements in cardiovascular, metabolic, and musculoskeletal functioning (Krustrup et al., 2010; Luo et al., 2018; Milanović et al., 2019). Recent narrative systematic reviews have also shown that sport participation affects psychological and social outcomes in middle-aged and older adults, such

as improved well-being, emotional social-support, sense of belonging, self-esteem, and life satisfaction, as well as reduced stress, depression, and anxiety (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020). Some sport-specific characteristics may influence such effects. For instance, participation in team sports has stronger dose-response associations with positive mental health indices than other forms of sport or physical activity (Chekroud et al., 2018; Hamer et al., 2009). This might be because of the inherent social network team sport affords (Nielsen et al., 2014). As for the evidence on the effects of highly competitive versus less competitive (i.e., recreational) sport on psychosocial outcomes, some research suggests that recreational athletes may experience greater improvements in psychological well-being than competitive athletes due to higher intrinsic aspiration towards sport participation (Chatzisarantis & Hagger, 2007).

All reviews to date on the psychosocial outcomes of sport participation have been narrative in nature (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020). Andersen et al. (2019) conducted an integrative review of the social and psychological outcomes of team sport participation, and suggested that, compared with individual sports, team sports may be associated with greater positive psychological and social outcomes. They also highlighted that the inherent competitive nature of sport may be associated with either positive or negative outcomes depending on a combination of demographic factors (e.g., sex, age, health status) of the participants considered (Andersen et al., 2019). Eime et al. (2013) systematically reviewed the psychological and social benefits of sport participation for adults, and concluded that sport participation may be associated with improved psychosocial health. These authors speculated that, relative to individual sports, club-based and team-based sport may afford even better psychosocial outcomes due to the intrinsic social nature of team sports (Eime et al., 2013). Gayman et al. (2017) conducted a systematic review of older adults' sport participation and noted the possibility of gender differences in how adults perceived their

own ageing. They also highlighted that sport participation affords positive cognitive outcomes for older adults, but may be associated with both positive and negative emotional and social outcomes; although perceived as enjoyable and a means to build social relationships, sport participation has also been a source of increased frustration resulting from changed functional capacity and performance declines, as well as a perceived lack of support from peers and family (Gayman et al., 2017). Kim et al. (2020) concluded that sport participation may be associated with psychosocial benefits including enhanced life satisfaction, social life, and psychological health.

However, narrative reviews have methodological shortcomings in that such reviews may be subject to biased interpretations of findings (Hunter & Schmidt, 2004). Contrastingly, a meta-analytic approach enables a more objective evaluation of the direction and magnitude of the associations in the reviewed literature (Lipsey & Wilson, 2001). Further, a meta-analysis enables a quantitative assessment of potential moderators and explanation of heterogeneity that exists in the literature. This is important as there is a need to assess variations in psychosocial functioning of ageing adults resulting from demographic and sport-specific factors (Weir, 2010; Young et al., 2015). Further, in contrast to narrative reviews, a meta-analysis provides estimates of study quality, publication bias and statistical power of the literature, and can correct effect sizes for studies that are inadequately powered (Hunter & Schmidt, 2004).

It is also important to systematically evaluate the use of theoretical frameworks in this literature. This is because in order to understand the mechanisms of action, psychological theory should underpin health behaviour change research (Michie et al., 2005). Previous reviews have discussed the theoretical implications of sport participation (e.g., Grima et al., 2017). Extending these reviews, we sought to examine the extent to which psychological theory has informed the design of sport interventions. In the extant literature, it is unclear

how many interventions targeting sport participation for ageing adults were explicitly informed by psychological theory, and of those which did, which theories have been shown to be associated with improved psychosocial outcomes.

The purpose of this meta-analysis was to quantitatively assess the association between sport participation and various psychosocial outcomes, and moderators of these associations, for people over the age of 35. This age criterion was chosen to reflect the fact that most Masters' Sports and Senior Games events (i.e., sport competitions that are specifically designed for older people who may continue to partake in, or return to, a form of competitive sports following the conclusion of their sports careers) include participants aged 35 and older (Tayrose et al., 2015). We also aimed to rate the quality of the included evidence, their statistical power, and the extent of publication bias. Another purpose was to assess whether psychological theories were utilised as a guiding framework for implementation in the included studies.

2.2 Method

The meta-analysis was registered with PROSPERO (Registration Number: CRD42020178043) and the Open Science Framework (https://osf.io/mqcu5/). Procedures were conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021).

2.2.1 Search Strategy and Study Selection

The lead author (HS) developed the search strategy in collaboration with two academic librarians and with input from the co-authors. The search strategies used in previous systematic reviews (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020) also provided a list of specific sports. We used these lists as the basis of the search strategy for the present review. The systematic literature search was conducted in July

2020 using 8 databases: CINAHL Plus, Cochrane Library, Medline (Ovid), PsycINFO, PubMed, Scopus, SPORTDiscus, and Web of Science. Additionally, we hand-searched ProQuest Dissertations & Theses to locate any unpublished work, and manually searched Google Scholar (filtered from 01/01/2020 onwards) to identify 'in press' articles not catalogued in the databases searched. We also conducted forward and backward searches of eligible articles to identify further eligible articles. The search strategy involved a combination of 3 strings of key terms covering psychosocial outcomes, sport participation, and ageing (search strings and a detailed search strategy are provided in Appendix B).

The study selection process is shown in the PRISMA flow diagram (Figure 1). We conducted a two-stage screening process – the titles and abstracts were reviewed by HS to assess eligibility, followed by a full-text review of the eligible articles conducted by two authors (HS and MDM) to identify articles for inclusion in the meta-analysis. A third author's (NN) input was sought when HS and MDM disagreed on the eligibility of some studies. The inclusion and exclusion criteria were constructed in accordance with the PICO framework (Table 1) (Schardt et al., 2007).

Type of Participants. Middle-aged and older adults (aged 35 years and above) who participated in sport were included. Studies that included or solely focused on participants under 35 years were excluded.

Type of Intervention. Any form of sport participation was included – from low level (i.e., recreational) to high level (i.e., competitive). If sport was one part of a multicomponent intervention, the study was not included. Contrived or adapted forms of sport (e.g., floorball, walking football) were included. Physical activities, such as running and swimming, were considered sports only if some competitive elements were evident.

Type of Comparator. Control (e.g., no intervention, wait-list control) and exercise (i.e., purposive, repetitive, planned, and structured physical activity with the objective of

improving physical fitness) (Caspersen et al., 1985) groups were the comparators. Studies including other sport comparators were not included.

Type of Outcome. Psychosocial outcomes were the focus of this review. These were broadly classified as perceived physical functioning (e.g., perceived health status), cognitive functioning (e.g., memory), social functioning (e.g., social support), positive psychological outcomes (e.g., well-being), and negative psychological outcomes (e.g., depression). Positive and negative psychological outcomes were segregated to reflect their conceptualisation as independent constructs (Keyes & Lopez, 2009).

Figure 1

PRISMA Flow Diagram

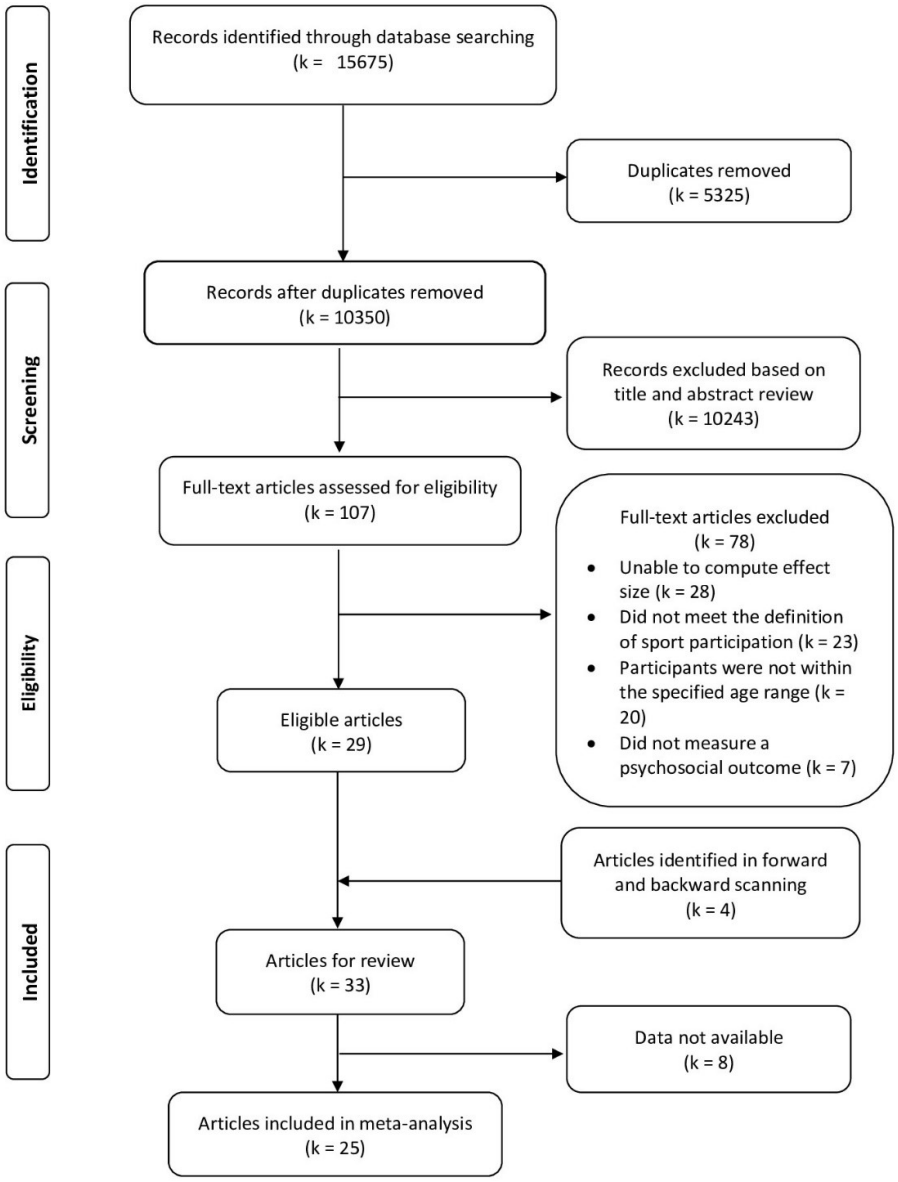


Table 1

Inclusion and Exclusion Criteria

	Inclusion Criteria	Exclusion Criteria
Type of studies	English language	All other languages
	Quantitative data (for effect size calculation)	Qualitative data (or insufficient quantitative data available, despite requests made to authors, for effect size calculation)
	All study designs	
Type of participants	Middle-aged and older adults (35 years and older)	Children and young adults (aged below 35 years)
	Any health status	
	Any gender	
Type of interventions	Sport participation[a]	All other forms of physical activity
		Interventions using sport participation as part of a larger multicomponent programme
Type of comparators	Exercise participation groups and control groups	Comparators involving other interventions (e.g., mindfulness training)
Type of outcomes	Psychosocial outcomes[b] pertaining to self-reported/perceived physical	All other outcomes (e.g., physical, behavioural)

	health, positive psychological outcomes, negative psychological outcomes, cognitive outcomes, and social outcomes

Note. [a] sport participation was defined in a manner similar to prior reviews, namely, as partaking in a specific form of physical activity requiring physical exertion, in which actions are governed by a set of rules, focusing on the development of physical/motor skills, and competing against other individuals or teams (Eime et al., 2013). Contrived forms of sport (e.g., pickleball, lifeball) that have been specifically designed for older adults were included if they met the definition of sport participation. In the case of studies involving sports such as running and swimming, these were considered on a case-by-case basis, and included only if the study explicitly mentioned that participants competed against other individuals or teams.

[b] psychosocial outcomes were defined as constructs tapping psychological and/or social processes (Andersen et al., 2019). Broadly, these were classified as perceived physical outcomes (i.e., individuals' perceptions of their own health status and functioning), positive psychological outcomes (i.e., beneficial affect-based mental health outcomes), negative psychological outcomes (i.e., detrimental affect-based mental health outcomes), cognitive outcomes (i.e., involving thinking and information processing), and social outcomes (i.e., involving interpersonal interactions between individuals within a sport group).

2.2.2 Data Extraction

Data extraction was conducted by HS using a data extraction form developed by the authors and the extracted data was checked by DFG for completeness. Information pertaining to study characteristics (e.g., author, year), participant characteristics (e.g., gender, age), sport participation (e.g., sport type, context), and outcome characteristics (e.g., outcomes measured) were coded. Statistical information (e.g., means, standard deviations, sample size, test summary statistics) was extracted to calculate effect sizes. Where these details were unavailable, corresponding authors were contacted to request this information, and where possible, these were manually calculated based on the available information. When correlation coefficients were required for effect size calculation but were unreported, we consulted previous literature and used the coefficients reported as a proxy for effect size calculation.

2.2.3 Risk of Bias Assessment

Risk of bias was assessed using the QualSyst tool (Kmet et al., 2004). This 14-item tool was chosen as the items are applicable to all quantitative study designs included in this meta-analysis (i.e., experimental and correlational). Risk of bias was coded by HS and 30% was randomly checked by MDM to ensure agreement on the ratings assigned (K = .85). Consistent with previous research (Henry et al., 2016; Jenkin et al., 2017), studies were classified as ‘strong’, ‘moderate’, or ‘weak’ based on the classification used by Henry et al. (2016) where a quality rating summary score of over .8 out of a maximum of 1 is considered ‘strong’, a score between .61 and .8 is considered ‘moderate’, and below .6 is rated as ‘weak’.

2.2.4 Statistical Analysis

We conducted a three-level random-effects meta-analysis, in order to account for dependencies between effect sizes and to allow for separating variances that could occur at

three different levels (Cheung, 2014, 2019) (i.e., sampling variance of individual effects, variance between effect sizes from the same study, variance between studies). Hedges' *g* (Lakens, 2013) was the effect size metric used, and standardised mean differences were calculated from the available information as a summary measure of effect size, using formulae from the Cochrane Handbook of Systematic Reviews. Where this information was unavailable, we used summary statistics (e.g., *t* scores, *p* values) to calculate effect sizes (Lakens, 2013). When studies included multiple comparison groups (e.g., exercise and control groups), effect sizes were calculated for both pairs (i.e., sport vs exercise group and sport vs control group). When outcomes were measured at multiple time-points, effect sizes were calculated for each of these time points, and dependencies were accounted for in the subsequent analyses. A forest plot was constructed to visualise the distribution of effect sizes. Statistical heterogeneity was assessed using I^2 (Higgins et al., 2003).

Moderation analyses were conducted to assess the extent to which study characteristics (e.g., study design), participant characteristics (e.g., age), and sport characteristics (e.g., sport type) explained heterogeneity in effect sizes. When studies did not report information required to code a particular moderator, these studies were excluded from that specific moderation analysis. As part of the moderation analysis, dose-response effects for intervention-based studies were to be assessed using frequency, intensity, and duration as moderators. However, due to unavailability of sufficient information regarding frequency and intensity, dose-response effects were assessed by examining intervention duration as a moderator. Publication bias was assessed using Egger's test (Egger et al., 1997) and funnel plots. A *p*-curve analysis was conducted to assess the evidentiary value of the summarised literature (Simonsohn et al., 2014). Risk of bias was also tested as a moderator to identify possible publication bias. Sensitivity analyses were also conducted to test robustness of findings by removing outliers and re-running analyses. All statistical analyses were

conducted using the *metafor* and *dmetar* packages on R (Harrer et al., 2019; Viechtbauer, 2010). Additionally, to assess the overall quality of evidence contributing to the meta-analysis, the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) tool was used (Guyatt et al., 2008).

2.3 Results

2.3.1 Study Selection

A summary of the study selection process is presented in Figure 1. Of the articles screened in the database search, we identified 29 eligible studies. Forward and backward searches of these papers yielded 4 additional eligible articles. One pair of studies (Bjerre, Brasso, et al., 2019; Bjerre, Petersen, et al., 2019), and a set of three studies (Ide et al., 2020; Tsuji et al., 2019; Tsuji et al., 2018) reported results from the same cohort; we coded these individual papers as the same study for the purposes of accounting for dependency in the effect sizes. We were unable to obtain the information required to calculate effect sizes for 8 studies (see Appendix C), despite two email requests to the authors. This resulted in 25 studies included in the meta-analysis.

2.3.2 Study Characteristics

The 25 included studies were published between 2010 and 2020, yielding 166 effect sizes. Across these studies, 166,252 participants were sampled, comprising 54% female participants, with an average age of 73.40 years (range: 35-92 years). Fourteen of these studies adopted an experimental design comparing sport participation with either exercise participation or control group comparators; eleven were cross-sectional studies. Of the 166 effect sizes, 38 were perceived physical outcomes, 57 were cognitive outcomes, 30 were positive psychological outcomes, 27 were negative psychological outcomes, and 14 were social outcomes (see Appendix D).

2.3.3 Risk of Bias

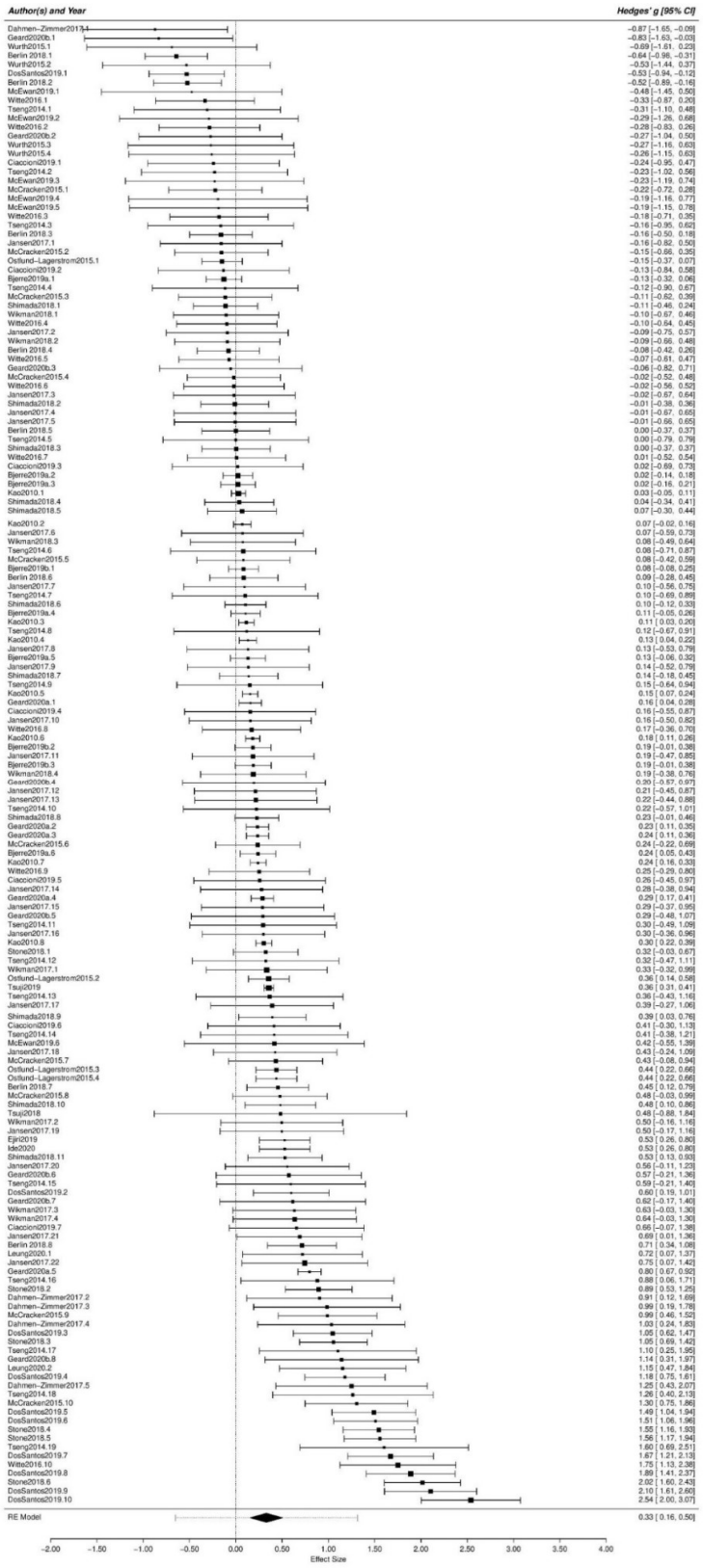
Overall, 11 studies were rated as ‘strong’, 12 studies as ‘moderate’, and two studies (Dahmen-Zimmer & Jansen, 2017; Würth et al., 2015) were rated as ‘weak’ (see Appendix E). In these two studies, the key criteria insufficiently addressed were: (1) performing random allocation, (2) blinding participants and investigators, and (3) controlling for confounding factors or reporting if or how this was done. Across all studies, the key sources of bias corresponded to poor reporting of outcome and exposure measures, low sample size, and insufficient reporting of all results. In most cases, this was due to the poor and inconsistent reporting of details within the papers, to fulfil the requirements of the scoring key of the QualSyst tool (Kmet et al., 2004).

2.3.4 Overall Effect of Sport Participation on Psychosocial Outcomes

The overall effect of sport participation (166 effect sizes, $k = 22$) on psychosocial outcomes was small ($g = .33$, se = .09, 95% CI = .16, .50; Figure 2). Further, with 95% confidence, the effect size from a new study is likely to be anywhere between the wide range of -0.65 and 1.31 (Hedges’ g). Significant within-study (level 2; LRT = 186.44, $p < .001$) and between-study variances (level 3; LRT = 46.37, $p < .001$) were noted, which explained 42.72% and 50.86% of the total variance, respectively, as indicated by log-likelihood tests. Given the considerable heterogeneity among effect sizes ($I^2 = 93.58\%$), moderation analyses were conducted to consider factors that may be responsible for the between-study variance (Higgins et al., 2003).

Figure 2

Forest Plot of Effect Sizes and 95% CIs for All Psychosocial Outcomes



Note. Squares represent each individual effect size; the size of each square reflects the relative sample size. The diamond represents the overall effect size (g = .33) and 95% CI; horizontal lines represent prediction intervals for the overall effect and each individual effect size. The vertical line represents a null effect. CI = confidence interval; RE = random effects.

2.3.5 Sensitivity tests

Sensitivity tests were conducted to assess the effect of extreme values on the pooled effects. For outliers that deviated extensively from the overall pattern observed, one study reported two effects for which residuals exceeded three standard deviations (dos Santos et al., 2019). By removing these two effects, the overall effect of sport participation on psychosocial outcomes reduced by .01 (g = .32, se = .08, 95% CI = .16, .48). For influential studies that have a large effect on the regression slope, 15 effects from 11 studies (Dahmen-Zimmer & Jansen, 2017; dos Santos et al., 2019; Ejiri et al., 2019; Geard, Rebar, Dionigi, Rathbone, & Reaburn, 2021; Geard, Rebar, Dionigi, & Reaburn, 2021; Ide et al., 2020; Leung et al., 2020; Östlund-Lagerström et al., 2015; Stone et al., 2018; Witte et al., 2016; Würth et al., 2015) were found to have a Cook's distance of more than three times the mean; however, exclusion of these outliers did not influence the overall effect of sport participation on psychosocial outcomes (g = .33, se = .09, 95% CI = .14, .51). Therefore, the overall effects remained largely unchanged as a result of extreme values in the literature.

2.3.6 Moderator Effects

Of 13 candidate variables assessed (see Table 2), only the type of outcome moderated the overall effect previously observed, $F(4, 161) = 4.11$, p =.003. In particular, the effect of sport participation was strongest for social outcomes (g = .51 [.21, .81]). Small to moderate-sized effects were noted for positive psychological outcomes (g = .45 [.22, .68]) and perceived physical outcomes (g = .43 [.21, .65]). The effect of sport participation was small, yet significant, for cognitive outcomes (g = .25 [.00, .50]). No effects were observed for negative psychological outcomes (g = .01 [-.24, .26]). Outcome type, when included as a moderator within the overall model, significantly reduced heterogeneity: Cochran's $Q(165) = 990.62$, p <.001. However, the residual heterogeneity remained statistically significant, $QE(161) = 949.96$, p <.001. Model comparisons suggest that the model that included

outcome type as a moderator was a better fit (AICc = 236.86, BIC = 257.94), compared to the overall model without any moderators (AICc = 243.73, BIC = 253.07). No other moderators significantly modified the overall effect.

Table 2

Moderator Analyses of the Effect of Sport Participation on Psychosocial Outcomes

Moderator	Psychosocial Outcomes	
	K	*g* (95% CI)
Percentage Female		
Intercept	19	.375 (.182, .567)***
Slope		-.129 (-.776, .518)
Sample Size	22	
Intercept		.329 (.153, .504)***
Slope		.000 (-.000, .000)
Age[a]	22	
Aged 65 or older	17	.393 (.205, .580)***
Aged under 65	6	.162 (-.123, .446)
Sport Type	22	
Team sport	6	.427 (.098, .755)*
Individual sport	11	.185 (-.042, .413)
Both	5	.564 (.214, .914)**
Sport Context	22	
Recreational	16	.274 (.070, .477)**
Competitive	6	.466 (.152, .780)**
Comparator Type[a]	22	
Control group	18	.348 (.156, .540)***
Exercise group	6	.273 (-.038, .583)
Intervention Duration (in number of weeks)	12	
Intercept		.188 (.036, .340)*
Slope		.002 (-.003, .007)

Outcome Type[a]	22	
Perceived Physical	15	.426 (.206, .645)***
Cognitive	10	.248 (.001, .496)*
Positive Psychological	14	.449 (.222, .677)***
Negative Psychological	12	.007 (-.241, .255)
Social	6	.508 (.210, .806)***
Publication Type	22	
Published	21	.333 (.152, .513)***
Unpublished	1	.290 (-.494, 1.074)
Study Design	22	
Cross-sectional	10	.484 (.246, .721)***
Experimental	12	.193 (-.031, .417)
Risk of Bias as QualSyst Summary Score	22	
Intercept		.331 (.155, .506)***
Slope		-.147 (-1.559, 1.264)
Health Status	22	
Unknown	19	.361 (.176, .546)***
Diagnosed health condition	3	.123 (-.358, .605)
Variation of Sport	20	
Adapted	9	.211 (-.077, .499)
Normal	11	.394 (.154, .634)**

Note. Sport type was coded as 'team sport' if participation typically involved participants being embedded within a team, 'individual sport' if participants were not part of a team and played against other solo opponents, and 'both' if the sport could have been played either individually or as part of a team, or if the study included a combination of team and individual sports.

Sport context was coded as 'competitive' if participants: "(i) were preparing (engaging in a training programme) for a major competition (i.e., national, international competition), and had a clear competitive goal to accomplish; (ii) competed at international, national, or regional level; or (iii) were making a living out of competing in a sport." Context was coded as recreational if these criteria were not met.[21]

Health status was coded based on the information reported in each study. If a diagnosed health condition was explicitly used to describe sport participants, the studies were coded as such. If this was not explicitly mentioned, the studies were coded as 'unknown'.

Variation of sport was coded based on the type(s) of sport each study included. If participants engaged in the standard version of commonly played sports, these studies were coded as such. Contrived forms of sport specifically designed for older adults were coded as adapted sports (e.g., walking football).

[a] For age, comparator type, and outcome type, some papers reported results for multiple categories separately, and effect sizes were calculated and coded as such. Hence, as a result of this overlap, the reported K for each category does not add up to the total number of studies included within each of these moderation analyses.

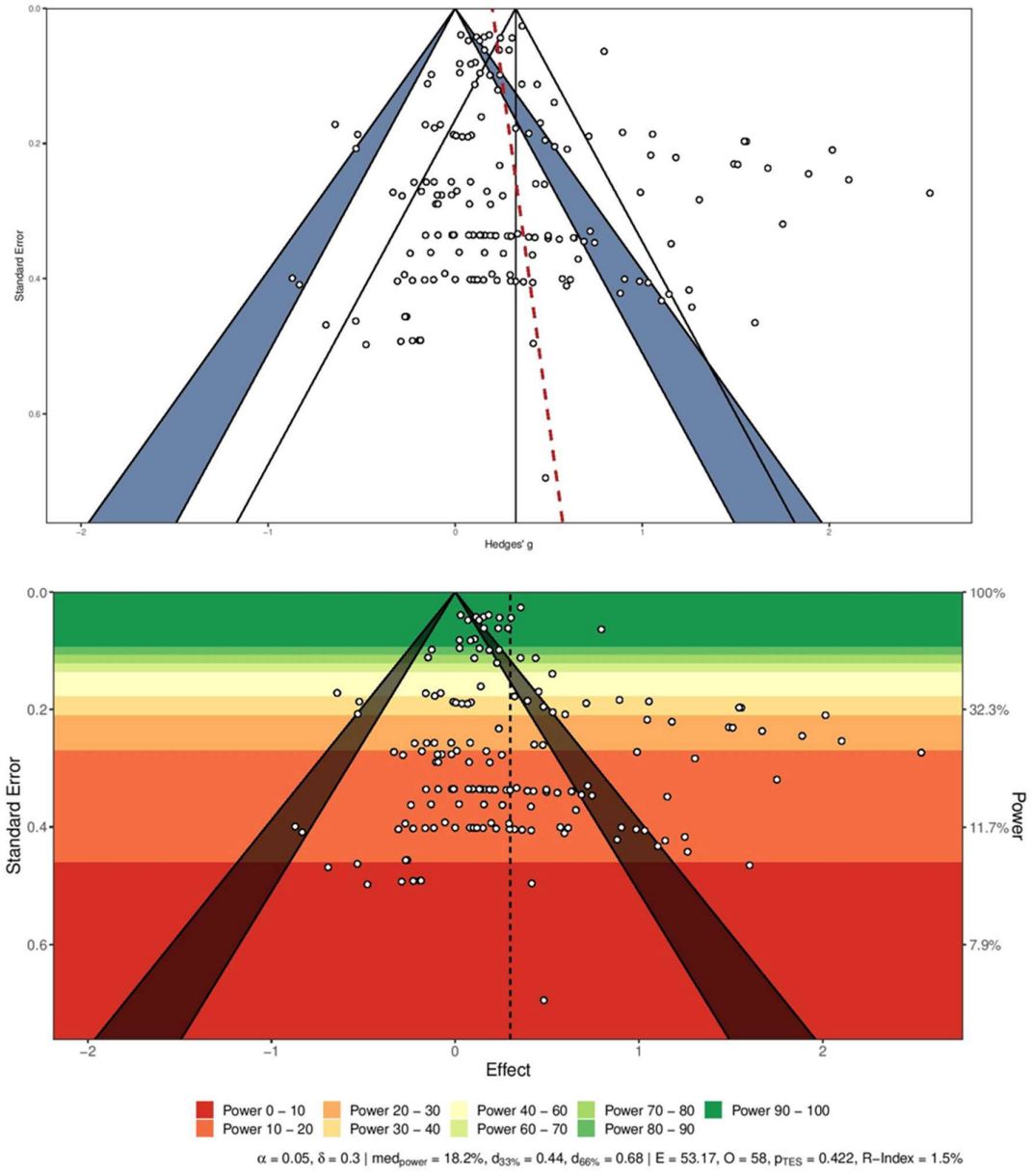
K = number of studies, *g* = Hedges *g*, CI = confidence interval, * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

2.3.7 Assessment of Meta-Bias

Visual inspection of the funnel plot suggested some degree of uneven distribution of effect sizes on either side of the mean effect; smaller studies appear to exhibit stronger positive effects of sport participation on psychosocial outcomes (Figure 3). However, Egger's test, t (20) = -.12, p = .90, indicates symmetry in the funnel plot. A power-enhanced sunset funnel plot (Figure 3) revealed that the median power of the primary studies is 18.2%, assuming an effect of g = .30; the true effect sizes required to achieve a median power of 33% and 66% is more substantial (δ = .44 and δ = .68, respectively). The summarised literature may be unlikely to replicate (R-index = 1.5%), assuming a true effect of .30 (the smallest effect size of interest; p = .05). Moderation analyses for meta-bias suggest that the magnitude of effects noted were invariant to differences in sample size, F(1, 164) = 0.05, p = .82, publication status, F(1, 164) = .01, p = .92, and study quality, F(1, 164) = 0.04, p = .84. A p-curve analysis demonstrated right skewness, with 89% of statistically significant p-values being $\leq$ .025 with high power (99%, 90% CI = 99%, 99%), suggesting evidential value (i.e., a true underlying effect) in the present findings (see Appendix F).

Figure 3

Contour-Enhanced Funnel Plot (Top) and Power-Enhanced Sunset Funnel Plot (Bottom) of Effect Sizes



Note. The sunset plot depicts effect sizes plotted within colour-coded power regions. Each individual effect size is plotted against its standard error, with the vertical line representing the overall summary effect size (g = 0.33). Shaded triangular panels represent the 95% and 99% confidence intervals for the overall effect size.

2.3.8 GRADE Assessment

Serious concerns were noted pertaining to risk of bias (see Appendix G) (Guyatt et al., 2008). A large proportion of the summarised literature presented correlational evidence and was rated as providing low certainty of evidence. A large proportion of between-study heterogeneity remained unexplained, even after moderation analyses. As we were unable to obtain data for eight studies (24% of the eligible studies), these studies were not included. Therefore, the level of certainty of evidence was classified as low.

2.3.9 Deviations from Protocol

There were minor deviations from the protocol. Our protocol stated that behavioural outcomes (e.g., psychomotor skills, physical activity engagement) would be assessed. However, we subsequently deemed these outcomes to be physical in nature, rather than psychosocial, and therefore, excluded them from our analysis. The protocol also mentioned the use of the *metaSEM* package (Cheung, 2015) for statistical analysis, however, we decided to use *metafor* (Viechtbauer, 2010) and *dmetar* (Harrer et al., 2019) because we focused on group differences rather than testing a theoretical sequence. Furthermore, none of the studies explicitly mentioned utilising psychological theories to guide their research. Therefore, although our protocol stated that the different psychological theories used would be coded and analysed as a moderator, it was impossible to do so.

2.4 Discussion

Our meta-analysis provides the first quantitative synthesis of quantitative studies on the psychosocial outcomes associated with sport participation for middle-aged and older adults. The main findings from the 25 included studies suggest that sport participation in these age groups is positively associated with an array of psychosocial outcomes. However, the overall effect was small and heterogeneous.

Narrative systematic reviews highlight that sport participation stands as a unique opportunity for adults to build social networks and provides a sense of belongingness (Allender et al., 2006). Our findings further reinforce these assertions, indicating that sport participation may be particularly important for social outcomes (e.g., social support, reduced social isolation). Oja et al. (2015) meta-analysed a body of literature showing the relevance of sport participation for some indicators of objective physical health (i.e., VO_{2max}, resting heart rate, and fat mass); our findings extend such findings for perceived physical health outcomes. In terms of cognitive outcomes, the small significant effect we found aligns with results of another meta-analysis evaluating the influence of physical activity on cognitive functioning in adults over 50 years of age (g = .29) (Northey et al., 2018). Sport participation could have the greatest influence on cognitive outcomes for children and young adults, a period of high neuronal plasticity and neurocognitive development (Felfe et al., 2016). As adults age, physical activity may protect against age-related cognitive decline (Paillard, 2015; Tyndall et al., 2018).

Prior systematic reviews suggest that sport participation could improve adults' psychological health and reduce negative psychological outcomes (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020). However, our meta-analysis suggests that although there may be an overall effect on psychosocial outcomes, this is modest in size, and is stronger for positive (e.g., well-being, life satisfaction), rather than negative (e.g., depression, anxiety), outcomes. Individuals experiencing poor psychological health report low enjoyment of physical activity, as well as high dropout from physical activity (Rosenberg et al., 2010). Hence, these individuals may be less likely to choose to participate in sport.

All other moderators tested were non-significant – in some cases, these findings are encouraging. For example, demographic characteristics such as age, sex, and health status did

not explain the heterogeneity observed. These findings are in line with Eime et al. who advocated that sport enables adults of all ages to experience several psychosocial benefits (Eime et al., 2013). Andersen et al. (2019) also concluded that team sport participation is associated with improved psychosocial outcomes, regardless of age or health status. Individuals, irrespective of age, sex, or health status, may be aware of their physical capabilities and skill level, and engage in sports that are appropriate for them, allowing for enjoyment of the activity and associated psychosocial benefits. Taken together, our moderation analysis suggests that sport participation may have significant positive, albeit small to moderate, associations with diverse psychosocial outcomes for population groups aged 35 year or older, supporting public health initiatives encouraging sport participation for all (Khan et al., 2012). However, sport participation does not automatically translate into sustained exercise behaviour change across the ageing population (Kelly & Barker, 2016). Therefore, policies promoting sport participation for the ageing population should consider the social, economic, cultural, and political environment that provides the conditions which enable people to make healthy lifestyle choices and maintain sport participation long-term (Gard et al., 2018). Further, in the context of research, a selection bias, such as the healthy user bias, is important to consider (Shrank et al., 2011); compared with individuals not engaging in sport, individuals participating in sport are more likely to already be experiencing good health, and are more likely to have the ability, means, and desire to maintain such participation (Dionigi & Gard, 2018; Eime et al., 2013).

Systematic reviews suggest that, broadly, team sports and recreational participation, as opposed to individual sports and competitive level participation, may afford better psychosocial outcomes (Andersen et al., 2019; Eime et al., 2013). In contrast, our meta-analysis revealed that the type of sport (i.e., team or individual sport) and context of participation (i.e., recreational or competitive) were not significant moderators. Sport

participation, whether within team or individual sports, may still provide a social network of others involved in the sport through affiliation with a sports club, particularly for ageing adults who may have fewer avenues to seek out social interaction (Nicholson, 2012). Sport variation (i.e., adapted or normal version of sport) was also unable to explain the observed heterogeneity. Older adults are known to have some specific challenges to participate in sport due to poor physical health, lack of appropriate sport opportunities, and limited accessibility of sport facilities and resources (Bethancourt et al., 2014; Schutzer & Graves, 2004). Older adults also have some unique motives to participate in sport such as maintaining health, finding opportunities to build relationships, and feeling part of a team (Stenner et al., 2020), which ultimately could result in different outcomes for middle-aged and older adults. Middle aged and older adults are a heterogeneous group, and therefore, require unique and diverse strategies to create appropriate and viable opportunities for sport participation (Jenkin et al., 2017). However, our findings indicate that participating in sport in any form and context can enable both middle-aged and older adults to experience the associated psychosocial benefits.

Programme duration for sport interventions was not found to influence psychosocial outcomes, indicating that a dose-response association between sport participation and the measured psychosocial outcomes, in terms of duration, may be unlikely. This contradicts evidence from large-scale surveys concluding that a dose-response association may exist between sport participation and mental health outcomes (Chekroud et al., 2018; Hamer et al., 2009). However, these studies assessed frequency in addition to duration of physical activity. Our meta-analysis only included intervention programmes (with an average duration of 19.6 weeks) to examine the dose-response association. Information pertaining to other parameters of dose (i.e., frequency and intensity) was inconsistently reported in the literature, and hence, could not be tested. Therefore, the dose-response association noted in prior literature (Chekroud et al., 2018; Hamer et al., 2009) may depend on frequency and intensity to a

greater extent than merely duration. We did not have information for duration of prior sport participation in correlational studies, and therefore this could not be included in testing the dose-response association. Therefore, it is not possible to generalise our findings to existing community-based sport participation. Volitional long-term sport participation within the community, outside research intervention projects, may be more intrinsically enjoyable and provide the dose-response benefits highlighted in the existing literature (Eime et al., 2013).

From a methodological perspective, although the funnel plot indicates that smaller sample size studies tended to report larger effects, this is quite commonly noted for underpowered studies (Brysbaert, 2019). Sample size, study design, comparator used, publication status, and study quality were not significant moderators of the overall effect, and did not explain the observed heterogeneity. Further, we found no evidence of publication bias. These findings suggest that the strength of the observed effects was invariant to the methodological aspects considered. Given the overall low observed power among eligible studies, it may be that the experimental studies were insufficiently powered to detect stronger effects than correlational studies.

Strengths of this study include the use of multilevel analyses to account for dependencies among effect sizes, the wide range of moderators assessed to explore heterogeneity, and the testing for power of studies. Our findings also highlight different effect sizes for different types of psychosocial outcomes, which has not been identified previously.

There are some limitations to consider when interpreting the findings of this review. To facilitate ease of the moderation analyses, we classified outcomes into broad groups (e.g., social, cognitive). When sample sizes permit, future meta-analyses may consider more specific psychosocial outcomes within the broad categories considered; for instance, the effect of sport participation on attention and processing speed may differ from that on memory. Caution is warranted in generalising these findings – the mean age of participants in

the included studies was 73.40 years and therefore the extent to which these findings can be generalised to younger adults requires further consideration.

Limitations of the primary studies restricted the scope of our analyses. None of the included studies explicitly mentioned utilising psychological theory to inform their research. However, interventions driven by psychological theory are shown to effectively improve long-term adherence and psychosocial outcomes, such as psychological need satisfaction, in other physical activity settings such as exercise (Ntoumanis et al., 2017; Teixeira et al., 2012). The lack of information regarding theoretical frameworks meant that it was impossible to consider the effectiveness of different conceptual frameworks as originally intended. Authors may consider reporting intervention-based studies in accordance with the TIDieR checklist, to ensure completeness of information provided (Hoffmann et al., 2014).

Several moderators tested in the analysis were exploratory in nature. Education level of participants, location of sport participation, and whether sports were single-gender or mixed-gender were inconsistently reported in the literature, and hence, we were unable to test these variables as moderators in the present meta-analysis. Some moderators, namely publication type and health status, were underpowered, due to unavailability of information and inconsistent reporting of these details in the primary studies, yet we included and reported these in the analysis to ensure transparency of reporting. Therefore, these findings should be interpreted with caution, and verified in future research. A large proportion of included studies (n = 11) were cross-sectional, and therefore, causality cannot be inferred from those studies. Following GRADE recommendations (Guyatt et al., 2008), the empirical base needs to be carefully considered due to the low quality of evidence. In the future, researchers should aim to address potential confounding factors and may wish to adopt more rigorous methods such as randomisation and blinding of participants.

Many studies failed to report factors known to have a key role in influencing psychosocial outcomes of sport participation. Motivation is one such factor that is widely known to influence well-being outcomes across a range of contexts (Ryan & Deci, 2000). Specifically, a meta-analysis by Ntoumanis et al. (2021) concluded that, within a health context, motivational variables based on self-determination theory are significant predictors of psychological well-being. Equally, forming strong social identities is of benefit for sport participants' health-related behaviours and outcomes (Stevens et al., 2020). Given that in our meta-analysis social outcomes were found to have the strongest effect sizes, it is likely that social identity may have been a contributing factor. Future research may consider testing such variables (i.e., motivation and social identity) as mediators of the effects of sport participation on psychosocial outcomes.

2.5 Conclusion

The meta-analysis found that sport participation was positively linked with a significant, albeit small, association with psychosocial outcomes in adults 35 years of age and older. However, heterogeneity was observed with different effect sizes for different types of psychosocial outcomes. The present findings reinforce the potential of sport as a health-supporting activity for individuals who might not be attracted to other types of physical activity, and affirm the psychosocial benefits of sport participation for a section of the ageing population. Further, these findings highlight the conditions under which these benefits are likely to be experienced, which provides valuable evidence to inform the design of future sport interventions to meet the preferences and needs of diverse sections of the ageing population. The psychosocial benefits of sport participation did not differ by participant-related or sport-related characteristics. Therefore, participation in any form of sport can reap benefits in terms of social, positive psychological, perceived physical, and cognitive outcomes, in addition to the widely known benefits for objective physical health.

Chapter 3: "More than just a walk in the park": A multi-stakeholder qualitative exploration of community-based walking sport programmes for middle-aged and older adults

Note: The following chapter has been written up for publication and is currently under revision. The submitted abstract is provided in Appendix H.

3.1 Introduction

Growing numbers of older adults and increasing levels of inactivity with age have expanded the research interest in experiences of sport and physical activity in older age. Reviews of this work have indicated factors relevant to participation to be broadly grouped as those related to physical ability (e.g., pain), personal benefits (e.g., health, well-being), motivation and beliefs (e.g., self-efficacy, religious beliefs), competing priorities, social influences (e.g., interaction with peers, or health professionals), and access difficulties (e.g., affordability) (see Franco et al., 2015; Ige-Elegbede et al., 2019). Group-based activities in particular, have been shown to provide safe and inclusive spaces which promote feelings of social connection and belonging (e.g., Andersen et al., 2018; Hwang et al., 2019; Meredith et al., 2022), which is significant given the high levels of social isolation reported among older populations (Centre for Ageing Better, 2019), and opportunities to socialise continually cited as a reason for participating in exercise groups/classes (Hwang et al., 2019).

In addition to focusing on the factors relevant to participation (often discussed using the language of 'barriers and facilitators'), qualitative research has also drawn attention to the relational, embodied, gendered, and socially shaped dimensions of ageing and physical activity (e.g., see Franke et al., 2020; Griffin, 2017; Oghene et al., 2015; Phoenix & Orr, 2017). Such research has expanded knowledge into how these experiences are influenced by the various relationships occurring within these contexts. For example, this work has shown how health and exercise professionals leading group-based activities hold high levels of social power through their ability to impact the composition, atmosphere, and subsequent enjoyment of a group activity (Evans & Crust, 2015; Morris et al., 2019). It has also demonstrated the ways in which older adults' experiences of physical activity are continually framed by broader social forces (e.g., ageism, sexism, ablism) that shape our expectations of what the ageing body can and cannot, or should and should not do. To that end, sport and

physical activity has been found to act as an important vehicle through which older adults can *resist* but also *reinforce* ageist stereotypes that foreground the ageing process as a period of physical decline, deterioration, and social withdrawal (Horton et al., 2019; Phoenix & Smith, 2011; Tulle, 2008).

One type of group-based physical activity that have undergone rapid growth in recent years are walking sports. These are adapted sports modified to reduce the cardiovascular demands on, and risk of injury to, participants (Reddy et al., 2017). Focusing instead on positioning, control, and motor skills, they provide an environment for social interaction (McEwan et al., 2018) and are well suited to those who wish to utilise their skills and remain physically active, without facing the vigorous demands that might accompany traditional sports played at their standard speed (Cholerton et al., 2019). Walking sport programmes are prevalent worldwide, with noted presence in the United Kingdom, Europe, South Africa, Asia, North America, and Australia[1] (Corepal et al., 2020). Walking soccer is the most prevalent walking sport with over 40,000 regular participants across 1000 clubs in England alone (Corepal et al., 2020).

Walking soccer programmes have been piloted in the UK and have been found to have the potential to be feasible, engaging, and sustainable (McEwan et al., 2018; Reddy et al., 2017). Similarly, Kinnafick et al. (2021) found walking netball to be a feasible and acceptable means to promote physical activity and health of middle-aged and older women. The social link established by team membership has been considered instrumental in attraction, long-term engagement, and maintenance of participation within these programmes

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[1] At present, in Australia, walking sports have received funding from the Australian government, are broadly driven by state sporting organisations, and delivered at local sport clubs as community initiatives to engage individuals who may be unable to participate in their traditional sport offering (SportAus, n.d.). Typically, these programmes are mixed-gender and provide flexibility through a Pay As You Go structure (Walking Netball, n.d.).

(McEwan et al., 2018). Preliminary findings indicate that walking sport participation may be associated with physiological benefits such as reduced body fat mass and body fat percentage (Arnold et al., 2015). Benefits may even extend to supporting individuals with serious mental health conditions through their recovery (Lamont et al., 2017). However, the long-term effects of walking sport participation on health and cognition remain largely unclear (Harper et al., 2019; Reddy et al., 2017).

Existing qualitative investigations have explored the experiences of walking sport participants. Reddy et al. (2017) noted that participants expressed initial apprehensions regarding capability to participate in, as well as scepticism surrounding the appeal of, walking soccer. Individuals' past sporting experience, values, and perceptions of physical activity, as well as awareness of and self-efficacy for walking soccer were participation enablers (Cholerton et al., 2019). Contrastingly, physical inability, feeling excluded, and psychological barriers, such as anxiety and apprehension, were reported as barriers to walking soccer participation (Cholerton et al., 2019). Further, positive experiences, a supportive culture within the programmes, and social and health-related outcomes were instrumental in maintenance of long-term participation (Cholerton et al., 2021; Reddy et al., 2017). However, these findings have relied, to a large extent, on the voices of walking sport participants and have not considered other stakeholders, such as decision makers within sport organisations and programme facilitators, and hence they provide a single perspective of the walking sport experience. Decision-makers and facilitators may be able to provide insight into the implementation and delivery of such programmes, complementing the perspective of participants.

Despite the widespread growth of walking sport programmes, Corepal et al. (2020) raised a concern regarding the limited research on walking sports, which restricts the potential to implement programmes tailored appropriately for the target population. Further,

they noted that there is a need to explore how participants' experiences within walking sport programmes may be enhanced in a manner that sustains long-term participation (Corepal et al., 2020). The success of walking netball programmes was attributed to adaptations made to the implementation and delivery of these programmes to best cater to the needs of the target population (Kinnafick et al., 2021). Therefore, implementation of future community-based walking sport programmes requires an understanding of the needs of the various stakeholders involved (i.e., decision-makers, programme facilitators, and participants) to ensure these are sufficiently addressed. Considering these diverse perspectives would allow for the implementation of walking sport programmes that would meet the needs of the target population, while would be feasible and acceptable for key decision-makers to provide.

The purpose of this paper is to further extend insights gained from this emerging body of research into the phenomenon of walking sport by incorporating the experiences of older players alongside those who serve as decision-makers and programme facilitators (in some instances in addition to playing the sport themselves). Being attentive to these often-neglected multi-stakeholder perspectives is of value because such qualitative work can enable a more holistic understanding of walking sport participation by combining player experiences with contextual insights into social-ecological facets of acceptability and feasibility relating to programme implementation and delivery. In other words, the relational and embodied aspects of walking sport participation can be considered alongside the practical and logistical issues involved with programme delivery. The findings of this paper are intended to help facilitate the future implementation of acceptable, feasible, and sustainable community-based walking sport programmes in a manner that encourages and enables long-term participation of middle- and older-aged adults.

3.2 Methodology and Methods

3.2.1 Research Paradigm

The present study forms part of a larger programme of research (i.e., this thesis) which aims to understand the potential of sport for promoting physical activity and mental well-being in middle-aged and older adults. This research includes a systematic review and meta-analysis of psychosocial outcomes of sport participation (Sivaramakrishnan et al., 2021; see Chapter 2) and a mixed-method study (see Chapter 4) investigating the predictors of non-participant's intentions to participate in walking sports, both of which were positioned in a post-positivist paradigm. That noted, as this ongoing programme of research has developed, there have been adjustments to the composition of the research team (the most recent of which included the involvement of an additional qualitative researcher). As a result, we have engaged in ongoing dialogue regarding the major issues confronting all research paradigms; we felt that the perspectives underpinning this current study were more closely aligned with those of constructivism. That is, we adopt a relativist ontology and subjectivist epistemology.

In their 5th Handbook of Qualitative Research, Denzin and Lincoln (2017) note how over the past decade, the boundaries between the major paradigms and perspectives have begun to blur. Yet they also warn that "perceptions of differences between perspectives have hardened", which can threaten to narrow the range and effectiveness of qualitative research practices (p. 98). We are aware that some of the positions on practical issues adopted by post-positivism versus constructivism differ, to the point of being incompatible. As examples, post-positivist inquiry typically aims to provide explanation of phenomena using prediction and control, whereas constructivism seeks to achieve this through understanding individual or collective reconstructions. Moreover, whereas post-positivist research draws on conventional benchmarks of "rigor" such as internal and external validity, reliability, and researcher

objectivity, constructivist inquiry favours trustworthiness and authenticity (Smith & McGannon, 2018).

We do not see this shift into a constructivist paradigm for the most recent study as an absent-minded switching between seemingly incompatible assumptions regarding how we *do* research. Indeed, it is fair to acknowledge that some of the authors feel more at home here than others. Some will remain working within constructivism from herein – perhaps progressing further over their career into ever greater participatory, action orientated methodologies. Others might return firmly to the positivist/post-positivist beliefs that better align with their world view and continued pursuit of experimental, hypothesis driven, chiefly quantitative research in this subject area. However, in coming together as a group of disparate researchers, with varied expertise in methodologies and methods we settled on this qualitative exploration being rooted in constructivism. This 'settling' was achieved through the practice of what Mouffe (2000) refers to as agonistic pluralism, where the purpose is to acknowledge difference and not necessarily to reach consensus.

In line with the philosophical positioning and broader aim to understand and interpret the meaning of walking sports through the joint construction of meaning between multiple stakeholders, semi-structured interviews were the chosen method for data collection. Drawing on Sparkes and Smith (2014), these were well suited because they enabled participants to share the meanings they attached to their walking sport experiences, including their feelings and ideas about its acceptability, feasibility and sustainability.

3.2.2 Participant Recruitment

We obtained institutional ethical approval from Curtin University Human Research Ethics Committee (HRE2020-0742; see Appendix I) and conducted our research in line with the appropriate ethical guidelines. These included, for example, voluntary participation, compensation for participants' time, and ensuring participant confidentiality. Purposive

criterion-based sampling and snowball sampling were used to identify participants (Sparkes & Smith, 2014). Our inclusion criteria stated that participants must be: (a) decision-makers involved in walking sports at an organisational level and responsible for the implementation of these programmes, (b) facilitators responsible for carrying out day-to-day tasks pertaining to the delivery of community-based walking sport programmes, and/or (c) middle-aged or older adults who had any experience playing walking sports (i.e., players). We contacted decision-makers at state-level sport organisations across Australia that offered walking sports via email, provided an information sheet explaining the purpose of the study, and invited them for interview. We liaised with consenting decision-makers to identify facilitators and walking sport players who were willing to participate in an interview. To understand experiences of walking sports from multiple perspectives, we actively sought representation from a range of walking sports (e.g., soccer, netball, hockey) and roles (decision-maker, facilitator, player) in our sample. Similar to Braun and Clarke (2019b), we rejected the neo-positivist positioning of the concept of saturation. Instead, we focused on information power, or the richness of data obtained, rather than the number of individuals interviewed (Malterud et al., 2016).

In total, 21 participants (10 males and 11 females) across five states and territories in Australia (i.e., Australian Capital Territory, New South Wales, Queensland, South Australia, Western Australia) were recruited. Although we set out to recruit from distinct roles as noted above, we found that individuals commonly fulfilled multiple roles. For example, some participants regularly played walking sports, occasionally facilitated sessions, and/or contributed in an administrative capacity. Walking sport players were aged between 53 and 72 years. To avoid potential identification of participants, given the limited number of organisations currently offering walking sports in Australia, we provide group-level demographic information (see Table 3).

Table 3

Demographic Information for Interviewees

Variables	Values
Continuous variables	*Mean (Standard Deviation)*
Age (for participants, in years)	62.25 (6.30)
Duration of walking sport participation (for participants, in years)	1.21 (0.85)
Categorical variables	*N (%)*
Gender	
Male	10 (47.6%)
Female	11 (52.4%)
Role*	
Decision-maker	9
Facilitator	10
Player	12
Sport	
Soccer	14 (66.7%)
Netball	4 (19.0%)
Hockey	3 (14.3%)
Prior experience playing sport (for participants)	
Yes	8 (66.7%)
No	4 (33.3%)
Prior experience playing sport (for decision-makers and facilitators)	
Yes	14 (100%)
No	0 (0%)

Note. *Interviewees, at times, fulfilled more than one role. Therefore, the *N* presented refers to the number of interviewees who fulfilled a specific role, and hence, it was not possible to report percentages for this variable.

3.2.3 Data Collection

Initially, we developed three interview guides – one for each category of participants interviewed. Each contained distinct questions that a specific stakeholder category might have been uniquely positioned to answer. However, in response to participants often fulfilling multiple roles, the interview guides were revised to provide a pool of questions that were drawn upon according to the role(s) of the person being interviewed. This allowed us to get a sense of the participant's personal experience, alongside (where relevant) organisational demands, and other implementation considerations. As the present study was exploratory, questions were open-ended, enabling participants to guide the narrative. HS piloted each topic guide prior to commencing data collection to ensure that questions elicited rich description. Key topic areas and exemplar questions for each interview guide are presented in Table 4 (full topic guides are presented in Appendix J).

Table 4

Interview Topic Guides – Topic Areas and Exemplar Questions

Interviewee	Topic Area	Example Question
Decision-makers	Popularity of walking sports	Can you tell me a little bit about the walking sport programmes that your club/organisation offers?
	Organisational demands and expectations	What kinds of resources does the organisation need to arrange for and contribute towards these walking sport programmes?
	Practical considerations for implementation	From your perspective, what is needed to ensure these programmes are viable and sustainable in the future?
Facilitators	Setting up and delivering walking sport programmes	How would you describe your relationship with participants of the programme?
	Responsibilities of the facilitator	As a coach, can you tell me a little more about what your responsibilities are for delivering walking sport programmes?
Participants	Sport history	Can you describe your past experience with physical activity?
	Motives for participation	What attracted you to start participating in walking sport?
	Experience and intentions to participate in the future	How did you feel after participating in walking sport for the first time?

Using the interview guide, HS conducted interviews in June 2021 using either telephone or Microsoft Teams video call facility, in line with Government COVID-19 protocols at the time of interviewing. At the end of each conversation, the participant was asked if there was any other relevant information to consider that had not been discussed, and the interview concluded when the participant was satisfied that all pertinent information was provided (Krueger & Casey, 2015). Interviews lasted approximately 56 minutes (ranging from34 to 91 minutes). Following each interview, HS recorded hand-written notes of additional details such as personal reflections and participants' non-verbal cues. These notes provided insight that helped navigate subsequent interviews. For example, HS regularly discussed her personal reflections with EQ, who was then able to recommend specific matters of interest that may be worth probing further in subsequent interviews.

3.2.4 Data Analysis

We analysed the data iteratively and inductively using reflexive thematic analysis as outlined initially by Braun and Clarke in 2006, and subsequently refined in the years that have followed to emphasise the researchers' role in knowledge production (see Braun & Clarke 2019a; 2021). The theoretical flexibility afforded by reflexive thematic analysis offered the possibility of inductively analysing data – we explored semantic and latent meanings through illustrative and analytical treatment of data. This theoretical flexibility was especially important when we were interpreting data that was obtained from individuals who held multiple roles as it was particularly challenging to discern the perspectives of specific 'types' of stakeholders. Therefore, reflexive thematic analysis enabled the positioning of personal experiences within the prevailing social context (Braun & Clarke, 2021). Equally, the accessibility of reflexive thematic analysis was also important as it enabled the research team, encompassing researchers with a wide range of expertise, some of whom had no prior experience of qualitative research, to contribute to the analysis (Braun & Clarke, 2022). In

keeping with our constructivist positioning, reflexive thematic analysis allowed us to interpret context-specific meaning and expand our understanding of walking sports, specifically in terms of addressing our research aims (Braun & Clarke, 2021).

To increase familiarisation with the data, HS transcribed all interviews verbatim, re-read the transcripts, and maintained reflection notes to record personal interpretations of the data. Given the limited research on multi-stakeholder experiences of walking sports, we adopted an inductive approach during the coding process (Braun & Clarke, 2019a). To enhance reflexivity through the analysis, HS provided CP and EQ with transcripts of the conducted interviews. We subsequently discussed our individual interpretations of the data – this process helped us improve the richness of our overall interpretation. HS drew out semantic and latent open codes iteratively. Latent codes were drawn out upon reviewing interview transcripts and interview notes several times, discussing interpretations with co-authors, complemented by an engagement with prior literature that had relevance to our interpretations of the data.

Codes were revisited to identify patterns and to begin to interpret meaning across the data. This process enabled the development of initial themes. Often transcripts were re-read and additional codes were assigned following initial theme development. For example, we had developed some initial codes labelled as ‘being active’, ‘self-efficacy for sports’, and ‘sport identity’. Upon revisiting the codes, we identified that these ideas shared a central organising concept in that these ideas were discussed by participants in relation to age-related participation benefits. As such, these codes were clustered together and labelled as ‘age-related benefits’. Similarly, ‘catering for diversity in needs’ was originally a separate theme. However, upon discussion, we agreed that this fitted as a subtheme within the overarching ‘tension between organisational demands and players’ needs’ theme; we noted that the codes pertaining to catering for diversity reflected divergent perspectives, one important aspect of

the noted tension between stakeholders competing needs and demands. Through this process, 'competitiveness' was separated from 'being active' as these codes seemed to be capture two distinct meanings (i.e., intrinsic and extrinsic participation motives).

During this analytic process, we drew thematic maps, which were continually reviewed and revised throughout. We then reflected upon the essence of each central organising concept to drive the definitions and names of themes to build an informative narrative that reflected the data. For instance, we renamed a theme originally called 'practical considerations' to 'walking sport facilitators as catalysts of success' to provide a more informative description of the subthemes that reinforced the key role of programme facilitators. Finally, to facilitate the writing-up phase, we identified appropriate participant quotes which represented different aspects of each theme, and contextualised our findings in relation to relevant literature.

3.2.5 Methodological Rigour

To support rigour, HS maintained a reflexive journal throughout the analysis process. For instance, journaling helped better understand personal assumptions relating to sport participation and ageing adults, and enabled us to draw connections between our assumptions and interpretations of the data (Braun & Clarke, 2019a). Following Levitt et al., (2021), our intention in considering multiple perspectives (i.e., decision-makers, facilitators, players) was not a positivistic attempt to find 'truth' through triangulation, but to support fidelity by enhancing our understanding of the diversity in experiences. Throughout the analysis process, HS sustained regular discussions with CP and EQ who were experienced in qualitative research and served as 'critical friends'. This was not to ensure accuracy of codes, but rather to encourage reflexivity in our analysis (Smith & McGannon, 2018). Thick descriptions were used to contextualise the findings within the participants' unique positioning (Levitt et al., 2021).

3.3 Results and Discussion

Four key themes were identified to provide insight into individuals' experiences regarding the acceptability, feasibility, and sustainability of community-based walking sport programmes. These were 'a renewed lease of life', 'navigating ageing stereotypes', 'tension between organisational demands and players' needs', and 'walking sport facilitators as catalysts of success'. The first two themes broadly relate to the acceptability of walking sports in the context of ageing, whereas the second two themes relate to the feasibility and sustainability of community-based walking sport programmes. Together, these themes provided unique knowledge of walking sport experiences that could be used to inform recommendations with a view to optimising the implementation of future walking sport programmes.

A Renewed Lease of Life

Reflecting on their experiences with walking sports, in the context of ageing, some walking sport players repeatedly referred to a sense of youthfulness attributed to their involvement in 'active' sports. Luke (pseudonyms used throughout), a 62-year-old walking soccer player and decision-maker remarked:

> *The next game that would be best suited for me would be lawn bowls…I'm much too young for that. I'm definitely much too active…there's not been an intermediary game from playing football. This is good…which is why we all do it.*

Such appraisals of youthfulness may facilitate walking sport participation, especially for individuals who identify as being 'physically active'. The idea of walking sports being an 'intermediary game' highlights that the moderate pace could cater to a wide range of fitness levels and abilities. Luke also appeared to adopt the view of sport being 'good', suggesting that walking sport participation is associated with socially desirable personal attributes. In western society, physical activity is a socially desirable behaviour, with a significant moral

worth placed upon sport participation (Gard et al., 2017). The moral worth of sport seemed to motivate Luke to remain active through walking sport participation – he perceived himself to be 'ageing successfully'.

Another participant, Alfred, who played walking soccer and served facilitator and decision-maker roles, expressed feeling a sense of confidence as a competent player during his transition from Masters' soccer to walking soccer at age 65:

> *I've realised that playing within my own age bracket of over 60s, all of a sudden, I was a good player again, because I wasn't having to compete against really young guys…playing within your own capabilities and within your own age bracket, all of a sudden, if you're a decent player, you're a decent player again, and that was good for me personally.*

A shift in playing environment appeared to permit favourable comparison with peers, or perceiving oneself to be more youthful than others of a similar age. Stephan et al. (2013) suggested that favourable self-perceptions are associated with rejecting negative age-related stereotypes, higher self-efficacy, intentions towards physical activity, and better physical functioning. For ageing adults who had previously played sport for a significant period of time, walking sports seemed to provide an opportunity to continue participating in sports in a less physically demanding manner. Such opportunities may enable players to experience self-efficacy related to their athletic skill, a construct which has been noted as a key facilitator for sustaining sport participation (Whitehead et al., 2019). Furthermore, sport participation may enable ageing adults to develop a positive ageing discourse (Jenkin et al., 2017). As individuals got older and felt limited in their ability to participate in enjoyable physical activities, walking sports seemed to fill a potential void, highlighting the potential identity continuity provided by such sport opportunities (Dionigi et al., 2013; Walsh et al., 2018). In Alfred's case, the feeling of being a 'decent player' seemed central to retaining a sport

identity. McEwan et al. (2018) indicated that a ‘sport identity’ sustained through walking sport participation may provide a purpose or ‘a new lease of life’. Such sense of purpose has been identified as relating to positive health practices such as making improved food choices and physical activity (Walsh et al., 2018). Thus, walking sports can accommodate change in a manner that, over time, traditional sports may be less able to and allow the ageing body to be responded to appropriately.

Navigating Ageing Stereotypes

Responses from stakeholders often highlighted (subliminally) the presence of ageism within walking sports, which, at times, were viewed by players as a barrier to overcome. For example, while describing the potential benefits of walking sports for ageing adults, one decision-maker (Graham) referenced a commonly-held negative stereotype about ageing and health outcomes, by saying ‘we don't want them being a burden on the medical system’. These (sometimes inadvertent) micro-aggressions were identity damaging and reflected the neo-liberal shift in language related to the ‘healthy ageing’ discourses predominant in sport and health promotion policies. Such discourses place the burden of an individual’s health on their own choices and actions (rather than social structures and inequalities) (Gard et al., 2017). These sentiments are also reinforced by the Exercise is Medicine movement that advocates for the prescription of exercise by healthcare practitioners, but at times, fails to acknowledge the social and structural limitations that may preclude participation (Pullen & Malcolm, 2018). Without due consideration of such limitations, these neo-liberal views may serve to inadvertently widen health inequalities.

Also showing how decision-makers and facilitators can play a role in sustaining such age-related stereotypes, when discussing the scheduling of walking netball sessions, one facilitator, Lily, remarked:

A lot of people of the demographic doing walking sport really probably have quite a bit of time…when you kind of look at their schedule compared to mine, it's like, you probably could move lunch half an hour later.

This view highlighted an underlying assumption that ageing adults lacked other competing responsibilities, when in fact, older adults can have busy lives – remaining in paid employment, keeping up with various engagements, fulfilling non-negotiable informal caregiver roles for elderly relatives and grandchildren, or simply pursuing other interests (Jenkin et al., 2016).

At times, walking sport players also showed that ageist stereotypes may have been incorporated into their sense of self. Patrick, a 72-year-old player, expressed:

At my age, I don't want to feel the pressure of winning. I don't enjoy it if we don't win and there's a large amount of disappointment. At my age, I just want to participate.

Patrick seemed to attribute his desire to participate without 'the pressure of winning' to his age, suggesting that others of a similar age may share his sentiment, and a desire to win may be more age-appropriate for younger players. In prior research, older adults' sport participation has been found to be influenced by perceived societal expectations regarding participation in age-appropriate activities (Jenkin et al., 2016). Through continued experience over the life course, societal expectations regarding age-appropriate activities may frame self-perceptions of ageing, which are believed to shape how people give meaning to notions of health, including their participation in health practices such as physical activity (Emile et al., 2014).

Within this theme, we also noted players, particularly those who had played sport previously, highlighted the stigma surrounding the label 'walking sport'. Several walking sport players recalled feeling an initial lack of interest towards trying out the walking sports available in their local community as a result of the label 'walking' sounding 'unappealing'

or ‘geriatric’. The slower pace seemed associated with lower mobility and senility. As such, this was deemed to be one of the biggest barriers to attracting new players to the sport, especially those who did not consider themselves to fit this prevailing age-related stereotype (see Horton et al., 2018). Keith, a 65-year-old player who had previously played traditional soccer to a semi-professional level, explained:

> *When I was first told about it, I turned my nose up, I’d never heard of it, I’d never seen it. I thought, “walking? What good is that?” And so, I was quite negative, really bad at first…*

However, an overwhelming majority of players who were able to move through this initial barrier, typically by going to watch a session or by accompanying a friend who was already a regular player, reported thoroughly enjoying the experience, and often became regular players themselves (as discussed in ‘A renewed lease of life’). Keith went on to add:

> *…but then when I went and I tried it, I thought, yeah, it brings back some memories in there and you could try a few little things that you used to do years ago.*

This common pattern showed how players may have navigated age-related stereotypes pertaining to sport participation. To create coherence between his self-identity and pre-conceived negative stereotyping of walking sports and their typical players, Keith may have distanced himself from this notion, believing that he was an ‘exception to the rule’ (p. 36); that such stereotypes applied to others rather than himself (see Horton et al., 2018). In such instances, these self-serving views of ageing may deter potential players from initiating walking sport participation.

Stakeholders also noted that walking sport programmes tended to *retain* a large number of those who came to try a session, but the largest barrier remained *initiating* interest. One walking hockey facilitator, Mitchell, wondered whether changing the name might eliminate this barrier:

They [potential players] believe they're still eighteen and they can still run…Maybe having the term walking in there is negative. Maybe there's something else that can be supplemented for it…to make it seem like it's more than just a walk in the park.

This view also seemed to echo players' association of fast-paced sport with younger ages and emphasised the need for programme marketing to reflect the move away from discourses of ageing as a period of decline. That said, due to the widespread growth of walking sports as a global brand, stakeholders believed it was too late to change this label. Rather, Mitchell added that, instead, the focus should be on addressing the stereotype rather than changing the name, by improving the visibility of the sport 'so people realise it's actually a lot more fun, and a lot more challenging than it sounds'. Improving visibility may have positive implications for ageing adults' perceptions and awareness of, as well as self-efficacy for, walking sports, while minimising anxiety and apprehension surrounding walking sport participation. Awareness, positive perceptions of the activity, and self-efficacy are all known to encourage the initiation of walking sport participation (Cholerton et al., 2019). Reflection is encouraged within the organisational structures regarding the extent to which players and staff might be (inadvertently) complicit in the negative stereotyping of ageing adults, as these may be enduring factors limiting participation.

Tension Between Organisational Demands and Players' Needs

When comparing stakeholders' experiences, some points of divergence were noted, particularly in relation to the visibility of walking sports, diversity in players' needs and motives, and competing interests of stakeholders and funders.

Firstly, interviews with decision-makers revealed how tensions were experienced relationally and seemingly accentuated discrepancies between stakeholders' beliefs around aims and actions of the programme. For example, decision-makers in charge of implementing walking sports in local communities described the desire to promote physical activity via

walking sports. This was shown in comments made by Will – a walking sport player, also involved with implementing and delivering a walking soccer program, who when describing the purpose of walking sports explained:

> *[Walking sport is] to give people who are otherwise socially isolated and inactive a bit of an outlet…a chance to kind of engage in a bit of social activity.*

In contrast, however, a different perspective was offered by Kate, another walking soccer facilitator and decision-maker, who noted that the 'main aim [of walking sport] is retention…to give people an opportunity to remain in the game', rather than to engage inactive individuals, or promote physical activity more broadly. This aspiration was reinforced by observations that a large proportion of publicity surrounding walking sport offerings was circulated among a database of ex-players, thereby limiting the visibility for, and inclusion of, those outside these networks. Incongruence between stakeholders' perspectives have been observed in other physical activity contexts such as prescriptive General Practitioner exercise referral schemes (Buckley et al., 2019). The prescriptive nature of these schemes may limit their acceptability to service end-users; instead, co-production, or an ongoing reciprocal interaction between key stakeholders, would support congruence between programme planning, delivery, and reception (Buckley et al., 2019). For example, Jimmy expressed a typical perspective among players regarding the lack of visibility of programmes:

> *I would've had no idea that this was available to me unless I'd heard through word of mouth. I didn't see any signs, any promotion, any advertising…but I enjoy it, I have a bit of fun, and I'm happy to keep going now for as long as I can.*

However, decision-makers and facilitators seemed perplexed. Jake, a player and facilitator, remarked:

I don't know what else we can do. I think there's even been something on one of the news programmes…I know I've seen it in the [newspaper]…all the media methods seem to have been used, but I don't know how we encourage more people.

These perspectives highlighted the stark contrast among stakeholders' perspectives, with such a disconnect potentially having a negative impact on the longer-term implementation and uptake of such programmes. Although sport organisations were largely aware of the benefits of sport participation for ageing adults, facilitating such opportunities remained a low priority (Jenkin et al., 2021). The resulting lack of awareness was a major barrier influencing the uptake of physical activity interventions among the older age group (Crozier et al., 2020). These challenges related to visibility, particularly the lack of marketing of sport programmes directed towards insufficiently active individuals, emphasise the need to consult with experts bearing a specific understanding of the target group (Staley et al., 2019). Further, increased participatory research in the implementation phase would ensure understanding of individuals and communities relative to such community-based sport programmes (Kinnafick et al., 2021).

A second tension highlighted through the analysis was the need for walking sport programmes to cater for the diversity in players' needs and motives. Troy, a decision-maker and facilitator, remarked:

I think when you're a 74-year-old, you just wanna have a kick or laugh, the result's not that important, as long as you're part of something…They're not as results or technique driven as younger players.

His comments reflected the general consensus among decision-makers that older adults had intrinsic motives for participation (e.g., enjoyment) and were motivated by a desire to participate, rather than a desire to compete or win. This assumption has been critiqued by numerous scholars working with older adults involved in sport/physical training who can

remain fully committed to beating opponents and achieving personal bests as they age (see Phoenix & Smith, 2011; Tulle, 2008; Dionigi et al., 2013). There is an increasing need to recognise the heterogeneity of this demographic group. As they age, adults may hold a variety of participation motives; extrinsic motives driven by competition and testing physical limits, but equally, intrinsic motives for social connection and affiliation (Molanorouzi et al., 2015; Stenner, 2020). In the present study, differences in players' preferences for competition was typically linked with their prior experience with sport. Those with several years of sport experience seemed to express a liking for competition, while novice players seemed to prefer non-competitive environments. Luke, a walking soccer player with several years of soccer experience, said:

> *It is competitive…that's why everybody wants to play, we all played [soccer] previously…You don't play [soccer] not to be competitive.*

Meanwhile, Christine, a novice player, said:

> *I want to be in an environment where the people around me don't mind that [I'm not competitive], if they mind that, then I'm not comfortable playing sports with them.*

The diversity in motives was a noteworthy tension that some facilitators struggled to reconcile, but, equally, was seen as something warranting action. One facilitator and player, Mary, recalled how they successfully navigated this situation:

> *We set up two pitches or two fields, one is for competitive, one is for people that don't want to be competitive…If someone comes along to watch…it's like a shop window…they've got a couple of options as to what they can do. [Previously] we've had one or the other only, and it's probably put some people off.*

This view acknowledged the heterogeneity of ageing adults' motives, and suggests one technique to successfully accommodate differing needs. It also highlights the consequences of failing to do so; individuals experiencing an incompatibility between their

preferences and the programme offering tended to disengage. As such, the uptake of walking sport programmes relies on varied participation preferences being successfully accommodated (Kinnafick et al., 2021).

A third tension related to concerns expressed regarding competing interests of government bodies, other funding bodies, and sport organisations. In Australia, funding was awarded to a national sport organisation to implement walking sports targeting the 55+ age group. However, some facilitators disagreed with an age limit being imposed, highlighting numerous reasons why individuals may participate in walking sports. Troy explained:

> *The grant funding is aimed at 55+. So, we report on that number to the government and [national sport organisation], but for me it's [sport] for anyone that can't play a regular format, so you might be coming back from a knee reconstruction…You might be overweight and want to find a low impact way to get into sport again.*

This view highlighted the influence of centralisation, or the increased national direction, on the implementation of community-based sport programmes. A trickle-down effect of nationally established policy regarding sport participation influences the focus of sport organisations, which in turn drives local community sport development targets (Dionigi et al., 2021). As such, centralisation may limit the autonomy of local sport organisations to adequately address community-specific needs (Misener et al., 2022). Instead, fostering interorganisational relationships may be vital to decentralisation, and moving towards collaborative approaches serving the needs of various stakeholders (Misener et al., 2022).

Regarding the growth of walking sports, a sense of frustration with sport organisations was noted. Jake, a player and facilitator, remarked:

> *I don't think [sport organisation] had done as much as they could do, because they also run Masters [sport], and they could lose people there. Unfortunately, sometimes*

it's people who think that they can see a dollar to be made rather than what they can do for the sport.

This view emphasised the negative impact of commercialisation of sports and the conflict of interest that may arise from centralisation. A strategic focus on more lucrative target groups, such as youth and elite athletes poses a key organisational barrier to promoting older adults' sport participation (Jenkin et al., 2016). Collaboration and engaged partnerships between sport organisations and other policy sectors may aid the sustainability of community-based physical activity programmes (Estabrooks et al, 2011).

Walking Sport Facilitators as Catalysts of Success

Participants discussed the importance of the facilitator's role in driving the accessibility and successful delivery of walking sports. Largely these discussions focused on how a facilitator may be distinctly positioned to understand the unique conditions that exist within their specific walking sport program, and therefore able to make appropriately informed decisions to support players' needs.

For instance, Amy, a facilitator highlighted a significant barrier in the reliance on technology, requiring players to register using a web-portal:

I guess my boss's perspective was they just need to register online, they just need to learn how to do it in this day and age. But then actually talking to them, some of them just don't have the capacity to go online, remember passwords and such…that's one of the main challenges.

This view illustrated a disconnect between decision-makers and players, where facilitators may serve to bridge the gap. In this instance, the decision-maker suggested that ageing adults simply needed to keep up with the times, failing to acknowledge structural and personal limitations, and dismissing facilitators' feedback. Yet, facilitators of that programme ensured that interested players were included regardless of whether they had registered

online, illustrating an instance where facilitators may have been better placed to understand and accommodate players' requirements.

Facilitators highlighted the importance of cultivating a need-supportive atmosphere. One facilitator, Lily, recalled an example of how she was able to use her professional knowledge as an exercise physiologist to support players:

> *A lot of them [say], "no, no, I have arthritis, I can't do that" and I'm like "It's okay, you can. I know what that is. I work with that a lot. Trust me, I'm not gonna do anything that's gonna hurt you". And then once one of them starts talking about their injuries, the rest of them join in, and it's like, "okay, we're all a little bit broken. We can do this". So, it's kind of nice.*

This view exemplified the importance of listening, acknowledging feelings, and reassuring players, while adapting sessions to suit players' skill-levels to ensure that walking sports were accessible to members of the community regardless of their skill or ability. Feeling 'broken' was reframed from being perceived as an individual weakness, to a collective identity within the group, where disclosure was shared, and players potentially felt supported in each other's company. These behaviours seemed to cultivate a sense of competence and relatedness among players. Such competence need-supportive behaviours demonstrated in a group exercise context have been regarded as effective in creating positive motivational experiences for players and maintaining participation (Hancox et al., 2018). Need-supportive communication, involving empathy, patience, and flexibility, may allow facilitators to understand players' perspectives and ensure these are given due consideration by other relevant stakeholders (Ntoumanis et al., 2018). In an investigation of a community-based netball programme, Walsh et al. (2018) also echoed the importance of the facilitator in fostering opportunities for players to experience competence and relatedness within the group. Such experiences of competence and relatedness may ultimately foster higher

autonomous motives, and lower controlled motives, for the activity (Ntoumanis et al., 2021), which in turn is related with positive physical and mental health outcomes (Ng et al., 2012).

A decision-maker and facilitator, Troy echoed this sentiment of 'fit' between facilitators and players:

> *We've had a [younger] person running it, that wasn't that interested or was just doing it to tick a box, not because they cared, so the key factor in football is to have a champion, someone that's [older], passionate about this demographic, that wants these programmes to succeed.*

This view suggested that facilitators' age may be implicated in this 'fit' – players may be further encouraged to participate in walking sports if they personally identified with the facilitator. The importance of having a 'champion' was supported by Kritz et al. (2020) who highlighted the influential role of peer leaders in promoting physical activity among individuals of a similar age. Equally, this 'fit' may also have to do with 'interest', 'care', and 'passion' for the demographic group, which, ultimately, were credited for the success of such programmes. This perspective was supported by Kate, a walking soccer decision-maker and facilitator:

> *That's probably a little bit unique to my program, only because I am so involved in it…I think the main reason for me is how I saw what it could do for my dad, and I thought this is an amazing thing, and I want to be a part of it.*

This view emphasised the necessity of buy-in from someone in a facilitator role. In line with this perspective, facilitators would need to understand the target population, as well as the benefits of, and barriers to, participation for these individuals (Staley et al., 2019). In this instance, Kate's understanding of the benefits of walking sports for the target group seemed to provide a greater purpose and motive to deliver such programmes. Taken together,

facilitators may serve a pivotal role in the success of community-based walking sport programmes.

3.4 Concluding Remarks and Future Directions

One of the key strengths, given the exploratory nature of our research, is that our inductive approach to reflexive thematic analysis has allowed us to highlight aspects of acceptability, feasibility, and sustainability of walking sport programmes that stakeholders consider to be important. Correspondingly, this research involved participants with diverse experiences in walking sports, representing perspectives of various stakeholders (i.e., decision-makers, facilitators, and players) of community-based walking sport programmes across Australia. This enabled a multi-faceted understanding, highlighting the diversity and, at times, incompatibility of the perceptions of such programmes (e.g., participation motives). Our findings extend prior qualitative literature on physical activity and ageing, suggesting that: (1) ageism remains a challenge that stakeholders need to navigate, (2) stakeholders may, at times, hold incompatible perspectives, and (3) facilitators may serve an important role in bridging the gap between decision-makers' and players' perspectives.

However, we acknowledge that our findings need to be viewed in context. The stakeholder participants in the present study were all involved in walking sports at the time of interviewing, and therefore, perhaps had a vested interest in walking sports and ensuring its continuity. We were unable to identify and interview individuals who had dropped out of walking sports, or those who perceived walking sports to be unappealing, who may presumably have different experiences with (or views of) walking sports.

Facilitators play a vital role in driving programme success and may be regarded as gatekeepers of information pertaining to the walking sport programme for which they are responsible. Facilitators' insight into players' feedback and relationships with decision-makers may be useful to help reconcile the noted tension among the various stakeholders of

walking sports. Decision-makers may wish to take on board facilitators' feedback to iteratively improve the delivery of walking sport programmes. Some examples of this feedback may be in reducing the reliance on technology for programme registrations, expanding programmes to players of all ages, finding ways to bridge the gap in programme visibility, and even understanding the importance of skilled facilitators who buy-in to the outcomes that walking sports can offer to the community.

Although we also emphasise that facilitators played a crucial role in programme success, there is a caveat – in practice, facilitators were typically unpaid volunteers and challenging to recruit. As such, inadequate support and compensation may place an undue and unrealistic burden on facilitators to deliver successful programmes. In the absence of sufficient funding to compensate facilitators for their time, engaging volunteers may be one potential solution. Yet, identifying facilitators/volunteers who are appropriately skilled and have the time and capacity to deliver such programmes may be a key challenge to ongoing delivery of non-traditional sport programmes for inactive adults (Staley et al., 2019). Future research may wish to consider how facilitators and volunteers may be effectively, feasibly, and sustainably engaged to deliver community-based physical activity programmes.

Although we highlight key stakeholders' stereotypes as relevant to physical activity and sport participation in ageing adults, ageism is a global issue that infiltrates all aspects of society and goes beyond walking sports (WHO, 2021). A complex interplay of factors, across personal to systemic levels, may be implicated in the persistence of these issues (Swift et al., 2017). For example, the incongruity between key stakeholders is a noteworthy challenge, that may limit the acceptability, feasibility, and sustainability of walking sport programmes in their current form. This incongruity may be, in part, because the implementation and delivery of walking sports have relied on administrators within sport organisations who typically did not belong to the target population of walking sports, which, in turn, could further exacerbate

the pervasiveness of ageing stereotypes held by key walking sport stakeholders. As these prevailing ageing stereotypes fail to acknowledge the varied ways of ageing, there is a need to dismantle the dominant narratives of decline. Institutions, including government and sport organisations, should reflect on policies and practices that may sustain ageist beliefs and/or systematically disadvantage ageing adults' access to appropriate community-based physical activity opportunities. Such stereotypes of ageing (including internalised stereotypes) could be addressed through the introduction of counter-stereotypical messaging and imaging to normalise physical activity in ageing adults. While a systematic review of interventions that addressed age-related stereotypes indicated reductions in negative views-on-ageing and increases in older adults' physical activity (Knight et al., 2022), future research may wish to consider whether such interventions may bear utility in diminishing stereotypes held by other key stakeholders. Equally qualitative work could be furthered in this regard, drawing attention to adults' views and experiences of age-related stereotypes in relation to health and physical activity.

Chapter 4: Predictors of middle-aged and older adults' intentions to participate in walking sport programmes: A social-ecological mixed methods approach

Note: The following chapter has been written up for publication and is currently under review. The submitted abstract is provided in Appendix K.

4.1 Introduction

Global trends suggest that physical activity levels decline with age (Hallal et al., 2012). One-third of the adult population is considered insufficiently active (i.e., performing less than 150 minutes/week of moderate physical activity; Hallal et al., 2012). For instance, in the Americas, Eastern Mediterranean, and European regions, over half the adult population over 60 years of age is insufficiently active (Hallal et al., 2012). In Australia, over half the adult population is insufficiently active, while this figure increases to over 70 percent for older adults (i.e., aged 65 years and older; AIHW, 2020). Physical activity has notable benefits across physical, psychological, and social facets of health (Penedo & Dahn, 2005), and insufficient physical activity has been noted as a key risk factor for health issues in ageing adults (Hallal et al., 2012). Therefore, it is imperative to identify appropriate physical activity options for aging adults, and encourage them to be more physically active, as a primary prevention tool for chronic illness.

Sport is a type of physical activity that involves physical or motor skills adhering to a specified set of rules, while competing against other individuals or teams. Meta-analytic evidence highlights that, for middle-aged and older adults, sport participation is linked with physiological benefits for cardiovascular, metabolic, and musculoskeletal health (Milanović et al., 2019). A recent meta-analysis has also indicated that, for middle-aged and older adults, sport participation is associated with psychosocial benefits, such as improved subjective well-being and social connectedness (Sivaramakrishnan et al., 2021). Compared with other forms of physical activity, team sport participation in adulthood may confer unique benefits – the social interaction and social networks afforded by team membership is associated with social benefits such as social integration and belongingness (Chekroud et al., 2018). However, mirroring physical activity trends, sport participation also markedly declines with age (Jenkin

et al., 2017). This decline may be a consequence of the lack of appropriate sport opportunities for aging adults, highlighting the need to cater to this age group (Jenkin, Eime, et al., 2018).

4.1.1 Walking Sport Programmes

Recently, adapted sports have gained traction. These sports involve altering specific aspects of traditional sports (e.g., football/soccer, netball) to provide suitable opportunities for individuals who would need sports to be adapted to participate. Walking sports are a specific type of adapted sport where, instead of running (as is typical in a traditional sport), participants are restricted to walking – the focus, therefore, is on positioning, motor skills, and teamwork, rather than cardiovascular capacity (Reddy et al., 2017). Typically, when compared with traditional versions of the same sports, walking sports are adapted to be non-contact, thereby lowering the impact and risk of injury (McEwan et al., 2019). Therefore, walking sports may be particularly appropriate for, and appealing to, an inactive or older section of the population, who may wish to benefit from increasing their physical activity, but cannot keep up with the high intensity of traditional sports (Corepal et al., 2020).

Although walking sport programmes have gained popularity in recent years, there is limited empirical evidence to support the implementation and delivery of appealing, feasible, and sustainable walking sport programmes (Corepal et al., 2020). Preliminary investigations in the UK suggest that walking football (soccer) and walking netball programmes are feasible, engaging, and sustainable when delivered to middle-aged and older adults within community settings (Kinnafick et al., 2021; McEwan et al., 2019; Reddy et al., 2017). The feasibility and acceptability of walking netball programmes were attributed to the participatory approach to implementation, which permitted adaptations to be made to cater to the needs of the target population (Kinnafick et al., 2021). The social connections resulting from team membership were also considered particularly important in sustained, long-term engagement (McEwan et al., 2019). However, the informativeness of these investigations

(McEwan et al., 2019; Reddy et al., 2017) are limited by the small sample sizes with a small intervention duration.

Recent research has explored the experiences of participants and sport organisations involved with walking sports (Cholerton et al., 2019; Cholerton et al., 2021; Reddy et al., 2017). Regarding initial attraction to walking soccer, participants retrospectively recalled that their sporting history, positive perceptions of walking soccer, and high self-efficacy for walking soccer were key enablers, whereas low perceived physical capability and social exclusion were potential barriers to participation (Cholerton et al., 2019; Reddy et al., 2017). Furthermore, positive experiences within these programmes, social connectedness, and perceived health benefits were highly influential in sustaining participation (Cholerton et al., 2021; Reddy et al., 2017). However, there is a need to concurrently consider the extent to which selected factors supported or undermined walking sport participation. The predictors examined in the present study were limited to those that prior literature identified to be potentially relevant to walking sport participation (or physical activity participation more broadly). The social-ecological model helped guide the systemic approach and appropriately categorise predictors of walking sport participation.

4.1.2 The Social-Ecological Approach

The social-ecological approach suggests that adults' physical activity choices are influenced by several predictors at personal, psychosocial, environmental, organisational, and policy levels (Boulton et al., 2018). These predictors extend from ones that are most proximal to the individual (i.e., personal) to ones that are distal contextual predictors (i.e., policy). The social-ecological model is relevant to understanding adults' walking sport participation (Kinnafick et al., 2021). At the personal level, considered to be the most proximal to an individual, a wide range of demographic characteristics (e.g., age, gender, ethnicity, relationship status, health status, prior sport experience) have been generally associated with

physical activity and sport participation (Cholerton et al., 2019; Fleury & Lee, 2006; Jenkin, Eime, et al., 2018; Olson et al., 2021). At the psychosocial level, the Theory of Planned Behaviour has been frequently used to explain individuals' intentions towards specific behaviours (including physical activity; Ajzen, 1991). This theory focuses on three key variables – attitudes (i.e., the extent to which an individual has a favourable or unfavourable evaluation of the behaviour), subjective norms (i.e., the belief regarding others' approval of, or participation in, the behaviour), and perceived behavioural control (i.e., the individual's perception of ease/difficulty of performing the behaviour; Ajzen, 1991). Together, these variables are shown to predict 44% of the variance in behavioural intentions (McEachan et al., 2011). The theory of planned behaviour was included in this study due to its demonstrated efficacy in predicting behavioural intentions in health behaviour contexts, including physical activity behaviours (e.g., see McEachan et al., 2011). Additionally, social support has been identified as instrumental in engaging adults in physical activities, and more specifically in sport (Bauman et al., 2012).

At the programme level, extant literature has indicated a wide range of programme-related predictors that may influence adults' engagement in walking sport programmes, as well as physical activity more broadly. Specifically, evidence suggests that adults may have varied preferences for organised (rather than unorganised) and competitive (as opposed to recreational) sports (Jenkin et al., 2017). The day(s) of the week, cost of participation, and proximity of the venue have also been associated with sport participation (Cholerton et al., 2019; Jenkin, Eime, et al., 2018). Furthermore, the age range and genders of other participants, and group size were also implicated in adults' interest in a specific sport programme (Kinnafick et al., 2021; Olson et al., 2021). At the environmental level, characteristics of the local neighbourhood, such as safety and traffic, influenced sport participation (Boulton et al., 2018; Jenkin, Eime, et al., 2018). At the policy level, it has been

noted that youth and elite sports tend to be prioritised over adult and recreational forms of sport participation (Jenkin et al., 2021). Therefore, the limited playing opportunities seemed to preclude ageing adults' sport participation (Jenkin et al., 2021). Furthermore, the neo-liberal shift in public policy and the rise in active ageing discourses in Western countries has placed the responsibility of health and well-being (including participation in physical activity) on individual choices while failing to consider the myriad of social and structural constraints that may impede these choices (Gard et al., 2017). However, the relative importance of each of these predictors across the social-ecological levels when considered concurrently is unknown, and warrants further attention.

Extant research is limited in scope for at least two key reasons. Firstly, prior research (Cholerton et al., 2019; Cholerton et al., 2021) has solely considered the perspectives of, and thereby catered to the needs of, existing walking sport participants. These investigations, utilising retrospective narratives to understand walking sport initiation, carry potential bias in participants' recollection of information, as well as a focus on a skewed sample of individuals who ultimately engaged with walking sports. To expand the delivery of walking sport programmes, there is a need to attract new participants (with diverse demographic features) to such programmes, and to consider their perspectives, and cater to their needs (Olson et al., 2021). Secondly, the foci of past investigations have been limited to personal and psychosocial predictors pertinent to walking sport participation. There is a need to consider the extent to which programme-related and environmental predictors may also be relevant to walking sport participation. A social-ecological approach would allow for the inclusion of programme-related and environmental predictors with personal and psychosocial predictors, enabling a multi-level understanding of the predictors of aging adults' intentions to participate in walking sports. Such an enquiry could lend insights that may be particularly beneficial for the growth and wider appeal of walking sport programmes.

4.1.3 The Present Study

To address the two aforementioned limitations (i.e., the focus on existing participants and on only some of the levels of the social-ecological model), our mixed-methods investigation focused on the perspectives of individuals who fit the target population in terms of age, but have no prior experience with walking sports (i.e., potential participants). We sought to build an understanding of the facets of walking sports that are appealing (or less so) to potential participants, and develop recommendations to support the future implementation of walking sports that would be feasible and sustainable for sport organisations to deliver in the long run. We examined personal, psychosocial, programme-related, and environmental predictors that were identified in prior research (Boulton et al., 2018; Kinnafick et al., 2021) as potentially relevant to walking sport (and physical activity) participation. Given the hypothetical nature of the behaviour, and our focus on the appeal of walking sport programmes, we considered intentions rather than actual behaviour as our primary outcome. Firstly, as previous research suggested that each level of the social-ecological model may be associated with physical activity, and specifically walking sport participation, we aimed to quantitively identify significant social-ecological (i.e., personal, psychosocial, programme-related, and environmental) predictors[2] of intentions to participate in walking sports for middle-aged and older adults. We expected that each level of the social-ecological model would uniquely contribute to explaining intentions to participate in walking sports. Secondly, we aimed to understand why these identified predictors may be contextually relevant to the target group. Qualitative methods enabled us to situate the quantitative responses within

[2] We use the term 'predictors' to mean statistical prediction, as originally used by Cohen in his seminal work on regression analysis (see Cohen et al., 2014). We do not intend to imply causality, given that quantitative data was obtained using cross-sectional self-report questionnaires.

respondents' personal circumstances and experiences that may not have been captured through quantitative measures.

4.2 Method

4.2.1 Study Design

This mixed-methods study was part of a larger research project (i.e., this thesis) that investigated the potential of sport for promoting physical activity and mental well-being in middle-aged and older adults. The overall research team encompassed individuals of varied expertise (i.e., qualitative, quantitative, and mixed methods research) who tend to operate from paradigms that, at times, are considered incompatible (e.g., positivism and constructivism). Consequently, having engaged in sustained discussions regarding the challenges pertaining to these conflicting research paradigms, we agreed that the perspectives associated with this current study were more closely aligned with those of post-positivism. In other words, while subjective bias cannot be eliminated from research and we may never understand reality with absolute certainty, combining multiple methods and sources of evidence can serve to improve our understanding of phenomena.

In line with our philosophical stance, and our research aim of building an understanding of the appeal of walking sports to middle-aged and older adults, we adopted an explanatory sequential mixed-method approach, comprising of a quantitative survey (phase one) followed by qualitative interviews with a subset of respondents (phase two). This sequential approach was chosen for two reasons: (1) to inform interviewee selection from the survey, and (2) so that the significant predictors identified from the survey could be further explored in the interviews. Correspondingly, the weighting of these two phases was unequal – there was greater emphasis on the qualitative data, which facilitated an interpretation of the findings of the survey data (Creswell & Clark, 2017).

4.2.2 Participants

In phase one, 311 middle-aged and older adults aged 35 and 84 years (49.8% male, 50.2% female, M_{age} = 46.08, *SD* = 9.75) completed an online questionnaire. All respondents were based in Australia and had never participated in walking sports at the time of data collection. Respondents varied in their level of physical activity; 27.3%, 33.1%, and 39.5% of participants reported a low, moderate, and high level of physical activity, respectively, with 27.3% of respondents insufficiently active. Additionally, 67.5% of respondents reported having previously played traditional forms of sport. Respondents' demographic information is presented in Table 5 and Table 6.

Table 5

Demographic Information for Categorical Variables and Correlations with Intentions

Variable	Category	*N* (%)	Correlation Coefficient (*r*)
Gender	Male	148 (52.5)	-.064
	Female	134 (47.5)	
Education Level	Postgraduate Degree	72 (25.5)	-.048
	Graduate Diploma/Graduate Certificate	26 (9.2)	
	Bachelor's Degree	93 (33.0)	
	Diploma / Advanced Diploma	29 (10.3)	
	Certificate Level	40 (14.2)	
	Secondary/Primary/Pre-primary Education	22 (7.8)	
Employment Status	Employed Full-time	154 (54.6)	.000
	Employed Part-time	53 (18.8)	
	Casual Employee	24 (8.5)	
	Unemployed	27 (9.6)	
	Retired	24 (8.5)	
Relationship Status	Single	65 (23.0)	.116
	De Facto Relationship	34 (12.1)	
	Married	160 (56.7)	
	Divorced/Separated/Widowed	23 (8.2)	
Income Level	Up to AUD $20,799	28 (9.9)	-.013
	AUD $20,800 - $31,199	26 (9.2)	
	AUD $31,200 - $41,599	29 (10.3)	
	AUD $41,600 - $51,999	21 (7.4)	
	AUD $52,000 - $64,999	38 (13.5)	
	AUD $65,000 - $77,999	39 (13.8)	
	AUD $78,000 - $103,999	37 (13.1)	
	AUD $104,000 or more	64 (22.7)	
Primary Mode of Transport	Personal Vehicle	235 (83.3)	-.046
	Shared Transport	47 (16.7)	

Ethnicity	Caucasian	232 (82.3)	.129*
	Other	50 (17.7)	
Sport History	Yes	186 (66.0)	.072
	No	96 (34.0)	
Physical Activity	Low	78 (27.7)	.096
Level	Moderate	96 (34.0)	
	High	108 (38.3)	

Note. *$p \leq .05$.

Table 6

Descriptive Data for Continuous Variables, Skewness, Kurtosis, and Correlations with Intentions

Variable	*M*	*SD*	Skewness	Kurtosis	Correlation Coefficient (*r*)
Intentions	8.62	4.39	-.274	-.588	-
Personal Predictors					
Age	46.08	9.75	.109	.010	.029
Perceived Health Status	1.82	1.02	-.002	-.484	.052
Psychosocial Predictors					
Attitude	39.29	8.90	-.298	-.065	.621*
Subjective Norms	8.56	3.71	-.209	-.489	.606*
Perceived Behavioural Control	11.82	2.97	-.756	.487	.169*
Social Support	28.70	11.76	-.371	-.667	.180*
Programme-related Predictors					
Coached Program	3.43	1.41	-.544	.451	.471*
Turn Up and Play Activity	3.17	1.43	-.266	-.040	.409*
Social Sport	3.62	1.43	-.432	.011	.462*
Competitive Leagues	2.87	1.65	-.210	-.748	.273*
Similar Aged Participants	3.83	1.33	-.808	.876	.407*
Large Group Setting	3.00	1.47	.025	-.163	.347*
Mixed-gender Participation	3.42	1.46	-.399	.044	.286*

Weekday Sessions	3.12	1.60	-.310	-.666	.327*
Weekend Sessions	3.19	1.51	-.248	-.321	.363*
Cost of Session	11.72	9.81	.544	.766	.328*
Distance of Venue	11.76	8.86	.612	.930	.323*
Environmental Predictors					
IRSAD	7.28	2.58	-.799	-.428	.051
Neighbourhood Environment	17.20	4.48	-.512	-.423	-.004

Note. IRSAD = Index of Relative Socio-economic Advantage and Disadvantage. *$p \leq .01$

Participants for phase two were identified using criterion-based purposive sampling to select individuals of wide-ranging demographic features and perceptions of walking sports to ensure that we considered a variety of experiences. Eligible individuals were those who scored within the top and bottom 10 percentiles on the measure of intentions in phase one. Seventeen individuals (8 males, 9 females, M_{age} = 45.76, SD = 8.15) across six states in Australia (i.e., Queensland, South Australia, Western Australia, Tasmania, New South Wales, and Victoria) completed phase two. Eleven of these individuals reported having participated in traditional sports (either in the past or at present). The wide range of participants interviewed allowed us to consider diverse perspectives, contributing to the richness of data and information power (Malterud et al., 2016). Interviewees' demographic information is presented in Table 7.

Table 7

Demographic Information for Interviewees

Pseudonym	Age	Gender	Intention to Participate	Physical Activity Level	Prior Sport Experience	Duration of Sport Participation (in years)
Alex	53	Male	Top 10%	High	Yes	43
Heidi	52	Female	Top 10%	Moderate	Yes	20
Isabel	42	Female	Top 10%	High	Yes	21
Celine	56	Female	Top 10%	High	Yes	20
Maya	41	Female	Top 10%	High	Yes	3
Joanna	58	Female	Top 10%	High	No	N/A
Matilda	53	Female	Bottom 10%	Moderate	Yes	15
Charles	37	Male	Bottom 10%	High	Yes	5
Adam	38	Male	Bottom 10%	High	No	N/A
Ryan	55	Male	Bottom 10%	High	Yes	50
Nathan	38	Male	Bottom 10%	High	No	N/A
Martin	40	Male	Bottom 10%	Low	Yes	5
Anthony	48	Male	Bottom 10%	Moderate	No	N/A
Lydia	55	Female	Bottom 10%	Moderate	No	N/A
Georgia	35	Female	Bottom 10%	High	No	N/A
Chloe	39	Female	Bottom 10%	High	Yes	15
Jordan	38	Male	Bottom 10%	Low	Yes	6

4.2.3 Procedure

Once institutional ethical approval was obtained from Curtin University Human Research Ethics Committee (HRE2021-0360; see Appendix L), participants were recruited through social media (i.e., Facebook, Twitter; flyer presented in Appendix M). Participants were given a link to provide informed consent and complete an online survey via Qualtrics, which took approximately 25 minutes to complete. The survey measured personal, psychosocial, programme-related, and environmental constructs that were identified in previous research (Boulton et al., 2018; Kinnafick et al., 2021) as potentially relevant to intentions to participate in walking sports (and physical activity broadly). The full questionnaire is presented in Appendix N. Following the analysis of quantitative data, 34 respondents were eligible for phase two and contacted to arrange a follow-up interview. Using an interview guide, we interviewed consenting participants (50% acceptance rate) via Microsoft Teams or by phone. Semi-structured interviews explored participants' experiences with physical activity and their views on walking sports. At the end of each conversation, the participant was asked if there was any other relevant information to consider that had not been discussed. The interview concluded when participants were satisfied that they had provided all relevant information (Krueger & Casey, 2015). Interviews were recorded and manually transcribed verbatim. On average, the interviews lasted 36 minutes (ranging from 24 to 58 minutes).

4.2.4 Measures

Measures were selected to assess relevant predictors of people's intentions to participate in walking sports at each level of the social-ecological model.

Personal Predictors. Participants were asked to report their age, gender, education level, employment status, income, relationship status, ethnicity, and primary mode of transport. The education and income categories were aligned with those of the national

census (Australian Bureau of Statistics, 2016). One item along a 5-point Likert scale (1 = *poor* to 5 = *excellent*) constructed for the purpose of this study was used to measure respondents' perceived health status (i.e., *"In general, would you say that your health is…"*). A further question constructed for the purpose of this study probed participants' sport history (i.e., "*In your adult life (since the age of 18), have you participated in any sport previously (for a minimum of 6 months)?*").

Physical Activity Level. The International Physical Activity Questionnaire – Short Form (IPAQ-SF; Craig et al., 2003) was used as a measure of physical activity level. Responding to seven items, participants were prompted to recall how physically active they had been in the past seven days (e.g., "*During the last 7 days, on how many days did you walk for at least 10 minutes at a time?*"). Together, these responses provided a measure of physical activity in terms of metabolic equivalents (METs), and allowed for classifying participants' activity level as either "high", "moderate", or "low". The IPAQ-SF scores have been shown to be reliable and valid for use with a wide range of adult populations (Craig et al., 2003).

Psychosocial Predictors. Items measuring attitude towards walking sport, subjective norms, and perceived behavioural control were constructed in accordance with recommendations by Ajzen (2006). All items were preceded by the stem "*If a walking sport programme is made available to me in the near future…*", reflecting that walking sport programmes might not have been a currently available option for some of the respondents. Two dimensions of attitudes (i.e., affective and evaluative) were measured using eight questions employing a 7-point semantic differential scale ranging from -3 to 3. These items were stemmed by "*participating in walking sport would be…*". Adopting the approach utilised by Thøgersen-Ntoumani (2009), four items each measured affective attitudes (*enjoyable–unenjoyable, boring–interesting, pleasant–unpleasant and stressful–relaxing*) and

evaluative attitudes (*useful–useless, harmful–beneficial, wise–foolish and bad–good*). In the present study, scores from this attitude scale demonstrated high internal reliability (Cronbach's alpha = .91).

Subjective norms and perceived behavioural control were measured with a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). Following Ajzen's (2006) recommendations, we wrote four items each measuring subjective norms (e.g., "*My family would want me to participate in walking sport*") and perceived behavioural control (e.g., "*I am confident that I could participate in walking sport if I really wanted to*"). In the present study, scores from the measure of subjective norms and perceived behavioural control demonstrated high (Cronbach's alpha = .84) and marginal (Cronbach's alpha = .64) internal reliability, respectively.

The Physical Activity Social Support Scale (Golaszewski & Bartholomew, 2019) was used to measure social support. We excluded the information, validation, and companionship support subscales, as they were less relevant to aging adults and the nature of walking sports. We used the emotional support and instrumental support subscales which comprised 4 items each assessing the psychological and practical support that may be necessary for the target population to engage in physical activities. For each item, participants responded to a 7-point Likert scale (1 = *never true* to 7 = *always true*). We modified the stem of the items to allow participants to reflect on a hypothetical, rather than actual, situation, so that the items were relevant to everyone (i.e., "*If needed, I would have someone who…*"). Sample items for emotional and instrumental support included "*could provide reassurance*" and "*could provide help traveling to participate in walking sports*" respectively. In the present study, scores from this social support measure demonstrated high internal reliability (Cronbach's alpha = .92). This measure has been used with an adult population (Golaszewski & Bartholomew, 2019).

Programme-Related Predictors. We identified potential programme-related predictors of intentions to participate from existing literature on physical activity and walking sport programmes (Boulton et al., 2018; Cholerton et al., 2021; Thøgersen-Ntoumani, 2009). For each of the nine identified predictors, we asked participants to rate the extent to which each predictor may influence their decision to participate on a 7-point scale (-3 = *unlikely to participate* to +3 = *very likely to participate*). These items encompassed features of the sessions (i.e., coached sessions, turn up and play, social/recreational, competitions, weekdays, and weekends) and participants (i.e., age, gender, group size) that may be relevant to consider. On a sliding scale, participants were also asked to indicate the maximum fee they were willing to pay per session (ranging from AUD$0 to AUD$20) and the maximum distance they were willing to travel to participate in walking sports (ranging from 0 km to 50 km).

Environmental Predictors. We used an adapted version of the Physical Activity Neighbourhood Environment Survey (PANES; Sallis et al., 2010) to measure environmental predictors. We selected six items from PANES, measured on a 4-point Likert scale (1 = *strongly disagree* to 4 = *strongly agree*), that were directly relevant to aging adults and walking sport participation. Two items each measured aspects of crime (e.g., "*The crime rate in my neighbourhood makes it unsafe to go on walks during the day*") and traffic (e.g., "*There is so much traffic on the streets that it makes it difficult or unpleasant to walk in my neighbourhood*"). One item each was used to measure access to recreational facilities (i.e., "*My neighbourhood has several free or low-cost recreation facilities, such as parks, walking trails, bike paths, recreation centres, playgrounds, public swimming pools, etc.*") and the observation of physically active people in the environment (i.e., "*I see many people being physically active in my neighbourhood doing things like walking, jogging, cycling, or playing*

sports and active games"). In the present study, scores from this scale demonstrated adequate internal reliability (Cronbach's alpha = .70).

We asked participants to report their residential postcode. We mapped respondents' postcodes onto Australian Bureau of Statistics data on Socio-Economic Indexes for Areas. Specifically, we used the Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) – using deciles, this metric summarised the social and economic condition of households within a specific area (1 = most deprived to 10 = least deprived area; Australian Bureau of Statistics, 2016).

Intentions. Three items measuring intentions were also constructed adhering to the recommendations of Ajzen (2006). These items (e.g., "*I would plan to sign up*") were preceded by the stem "*If a walking sport programme is made available to me in the near future…*", Items were measured along a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). In the present study, scores from this measure demonstrated good internal reliability (Cronbach's alpha = .81).

Interview guide. An interview guide was developed following the completion of phase one. Once the statistically significant predictors were identified, questions pertaining to these key constructs were developed to explore the reasons why these predictors may be relevant to adults' intentions to participate in walking sports. The interview guide comprised of questions regarding participants' experiences with physical activity (e.g., "Can you tell me a little more about your experience with participating in physical activities?"), the appeal of walking sports (e.g., "What is your impression of walking sports?"), the significant predictors identified in phase one (e.g., "To what extent would your friends and family's opinions on walking sports influence whether you choose to participate?"), and barriers to walking sports (e.g., "What are some things that might make it difficult for you to participate in walking sports?"). The interview guide was piloted prior to commencement of data collection to

ensure that the questions elicited rich descriptions. The full interview guide is presented in Appendix O.

4.2.5 Data Analysis

In phase one, we analysed quantitative data using SPSS 28.0. There were 119 (1.20%) missing values noted across 22 variables in the dataset, which, upon inspection, appeared to be missing at random. This has been noted as 'inconsequential' to the statistical analysis (Tabachnick et al., 2007). Therefore, we performed the analyses on the subset of complete cases ($N = 282$). Power analysis using G*Power indicated that our sample size is sufficiently powered (90% power, alpha = .01) to detect effects as small as .15 for incremental step variance in multiple linear regressions. We used hierarchical multiple linear regressions; given that prior investigations focused primarily on personal and psychosocial predictors of walking sport participation, we wished to consider whether programme-related and environmental predictors would explain variance in intentions beyond personal and psychosocial predictors. Therefore, the most proximal (i.e., personal) predictors were entered at step one, followed by the more distal psychosocial predictors at step two. Further distal programme-related predictors were entered at step three as these were specific to walking sport participation, and finally, general environmental predictors were entered at step four. Given the large number of predictors within our analyses, we adopted a cut-off of $p \leq .01$ as indicative of significance.

In phase two, we analysed qualitative data iteratively and deductively using reflexive thematic analysis (Braun & Clarke, 2019a). To promote data familiarisation, HS transcribed all interviews verbatim and reviewed transcripts, making reflection notes throughout the process. HS assigned initial semantic codes – this was done deductively as the aim was to provide further insight into why certain predictors (identified in phase one) were relevant to respondents' intentions to participate in walking sports (Braun & Clarke, 2019a). Codes were

revisited to interpret meaning and patterns in the data, facilitating the development of initial themes. The process of theme development was conducted iteratively, identifying patterns in the data while revisiting the statistical findings to ensure the themes developed explained these statistical findings. This enabled us to cluster codes around some key central organising concepts. Through the theme development process, EQ served as a 'critical friend', improving the richness of the data. In order to name each theme, we reflected on the central organising concept of each theme – we wanted the name of each theme to provide an insight into a potential explanation for the findings of phase one. To facilitate the process of writing-up our findings, we identified suitable participant quotes that were representative of the different facets of each theme.

Pseudonyms have been used throughout the manuscript to protect interviewees' identity. When introducing participant quotes, in order to allow the reader to make contextual inferences, we provide the interviewee's age (e.g., 53), whether they belonged to the top or bottom 10 percentile on the measure of intentions (e.g., top 10%), and whether they were currently participating in sports (i.e., current sport participant), had previously participated in sports (i.e., past sport participant) or had no prior experience participating in sports (i.e., no sport history) in parentheses.

4.2.6 Methodological Integrity

We sought to ensure methodological integrity of the qualitative data by maintaining fidelity and utility (Levitt et al., 2021). Fidelity was maintained using groundedness, wherein direct quotes from participants are presented alongside our interpretations of the findings, thereby depicting their original account of the experience (Levitt et al., 2021). Additionally, we interviewed a diverse range of individuals (i.e., those who scored within the top and bottom 10 percentiles on the measure of intentions). Seeking multiple perspectives allowed for a deeper understanding of why certain predictors may be relevant to middle-aged and

older adults' intentions to participate in walking sports (Levitt et al., 2021). Utility was preserved through contextualisation, whereby contextual features of interviewees (where relevant) are described to indicate how they may be associated with inter-individual variations in perspectives (Levitt et al., 2021).

4.3 Results

4.3.1 Quantitative Findings

Descriptive Statistics and Preliminary Analysis. The data were normally distributed (i.e., skewness and kurtosis values for the variables under consideration were within the range of -1 and 1), and hence, analyses were conducted with raw data. For categorical variables, when descriptive analysis showed that very few participants chose a specified response option, we combined some groups to form more evenly split categories. For education level, secondary, primary and pre-primary levels were combined. For relationship status, divorced, widowed and separated were combined. For income, categories below $20,800 were combined. For primary mode of transport, bicycle was combined with the pre-existing 'personal vehicle' category, while rideshare, bus, train and ferry were combined into a new category called 'shared transport'. For ethnicity, limited responses from 'non-Caucasian' ethnicities meant that these were all combined into one category.

Means and standard deviations for the variables studied, along with skewness, kurtosis, and their correlations with intentions are presented in Tables 5 and 6. Bivariate correlation analyses indicated that ethnicity, as well as all of the tested psychosocial and programme-related predictors, were significantly associated with intentions to participate in walking sports.

Social-ecological Predictors of Intention. A four-step hierarchical multiple linear regression was conducted to examine the association between various personal, psychosocial, programme-related, and environmental predictors and intentions to participate in walking

sports, as presented in Table 8. The results revealed that, at step one, personal predictors accounted for 7.2% of variation in intentions – this was non-significant, $F(11,270) = 1.915$, $p = .037$, with a small effect size (Cohen's $f^2 = .08$). At step two, the addition of psychosocial predictors explained 41.6% of the variation in intentions, and this change in R^2 was significant, $F(4,266) = 54.097$, $p < .001$, with a large effect size (Cohen's $f^2 = .71$). At step three, the inclusion of programme-related predictors explained 6.2% of the variation in intentions, and this change in R^2 was significant, $F(11,255) = 3.218$, $p < .001$, with a small effect size (Cohen's $f^2 = .07$). Finally, at step four, the incorporation of environmental predictors explained 1.1% of the variation in intentions, and this change in R^2 was non-significant, $F(2,253) = 3.256$, $p = .040$, with a small effect size (Cohen's $f^2 = .01$). Together, the full model explained 56.2% of the variation in intentions to participate in walking sports, ($F(28,253) = 11.600$, $p < .001$) with a very large overall effect size (Cohen's $f^2 = 1.28$). In the full regression model, perceived health status ($\beta = .139$, $p = .010$), attitude ($\beta = .324$, $p < .001$), subjective norms ($\beta = .213$, $p < .001$), and the maximum distance respondents were willing to travel ($\beta = .150$, $p = .005$) were found to be significant predictors of intentions.

Table 8

Summary of Hierarchical Multiple Linear Regression Analysis Predicting Intentions to Participate in Walking Sports

	Model 1			Model 2			Model 3			Model 4		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
Personal Predictors												
Gender	-.879	.556	-.100	-.748	.423	-.085	-.708	.428	-.081	-.673	.425	-.077
Age	.021	.031	.047	-.009	.024	-.020	.022	.024	.049	.031	.024	.069
Education	-.045	.178	-.016	-.020	.133	-.007	-.010	.129	-.004	.027	.129	.010
Employment Status	-.065	.267	-.020	.053	.201	.016	.101	.196	.031	.123	.195	.037
Relationship Status	.490	.285	.104	.007	.220	.001	.023	.214	.005	.079	.213	.017
Income Status	-.091	.140	-.049	.007	.106	.004	.010	.104	.005	-.021	.105	-.012
Primary Mode of Transport	-.446	.707	-.038	-.534	.529	-.045	-.122	.524	-.010	-.110	.519	-.009
Ethnicity	1.758	.707	.153	.097	.541	.008	.179	.538	.016	.239	.534	.021
Sport History	.864	.595	.093	.233	.449	.025	.247	.441	.027	.220	.438	.024
Perceived Health Status	.646	.288	.150	.320	.228	.075	.548	.229	.128	.596	.228	.139*
Physical Activity Level	.856	.368	.157	.493	.277	.091	.521	.274	.096	.502	.272	.092
Psychosocial Predictors												
Attitudes				.205	.029	.418*	.159	.030	.323*	.159	.030	.324*
Perceived Behavioural Control				-.114	.075	-.077	-.182	.075	-.123	-.178	.074	-.120

	Model 1			Model 2			Model 3			Model 4		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
Subjective Norms				.452	.070	.374*	.278	.075	.230*	.258	.075	.213*
Social Support				-.015	.020	-.041	.007	.020	.018	.016	.021	.043
Programme-related Predictors												
Coached Program							.261	.188	.083	.282	.189	.090
Turn Up and Play Activity							.190	.173	.060	.173	.172	.055
Social Sport							.269	.201	.087	.300	.199	.097
Competitive Leagues							.002	.165	.001	.030	.164	.011
Similar Aged Participants							.107	.219	.031	.149	.223	.044
Large Group Setting							.035	.185	.011	.015	.185	.005
Mixed-gender Participation							-.182	.175	-.059	-.256	.176	-.083
Weekday Sessions							.185	.168	.067	.271	.171	.097
Weekend Sessions							.122	.155	.042	.106	.154	.036
Cost of Session							.021	.024	.047	.011	.024	.024
Distance of Venue							.069	.026	.139*	.075	.026	.150*
Environmental Predictors												
IRSAD										.177	.079	.104
Neighbourhood										-.068	.049	-.067
Environment												

Note. IRSAD = Index of Relative Socio-economic Advantage and Disadvantage. *$p \leq .01$.

4.3.2 Qualitative Findings

We identified four key themes relating to middle-aged and older adults' intentions to participate in walking sports: 'What's in a name? A need for attractive nomenclature', 'Overcoming a fear of the unknown', 'Congruence between personal physical activity needs and sport's offering', and 'Promoting achievability of the activity'. The first two themes relate to the novelty of walking sports, whereas the second two themes relate to individual differences in the appeal of walking sports.

What's in a name? A need for attractive nomenclature. Participants highlighted the lack of visibility of walking sports. None of the interviewees had ever heard of walking sports prior to research participation. Consequently, they noted that their initial impression, based on a description of the activity, was that it "sounded lame" and uninteresting. Anthony (age 48, bottom 10%, no sport history) said:

> *Playing just a standard or existing sport, but just at a walking pace, I find it a little bit embarrassing…if I was to play something like that, it would probably be quite good for me and I imagine that if I was able to get past that hurdle, I would probably have a bit of fun, but yeah, I don't know…in the back of your mind, you know you're meant to run, but this is what we're doing instead.*

In order to address this barrier, participants offered suggestions; rather than emphasising what is absent from the activity, positive descriptions may foster favourable attitudes towards walking sports, and hence, increase the likelihood of individuals participating. Joanna (age 58, top 10%, no sport history) pondered:

> *I found it…incredibly appealing. I just think it's about, probably not focusing on the fact that it's walking, but focusing on the other things that it brings with it. So, I think just even calling it walking sport probably makes it sound very unexciting. But I mean, it describes what it is, but it doesn't make it sound appealing generally, but you*

know it's attainable, it's helpful, beneficial, it's fun, it's social. I think, if you look at using other adjectives around that, then that would make it more appealing.

Furthermore, when walking sports were described as skill-focused sports, rather than traditional sports without running, interviewees seemed to hold more favourable opinions of walking sports. Nathan (age 38, bottom 10%, no sport history) said:

I hadn't thought of that skills aspect, I think the more I think about that, I actually really like that, and that's probably almost the main appeal to me now that I think about it. Even if you're learning a sport for the first time… you can learn it at a walking pace without some of the other things you need to learn along with it…I think it would be great, yeah.

Participants highlighted that, given the novelty of the activity, it was challenging to visualise what the activity would look like in action – further insight would be beneficial to build an understanding of, and potentially improve their attitude towards, the activity. Isabel (age 42, top 10%, current sport participant) said:

One of the things that came immediately to mind when I was trying to picture it was "Oh my God, how do they cover that much distance?". And that's a really hard thing to imagine…the ball moves way faster than I can walk…so, [am I] going to be just standing around waiting for people to walk up and down before the next thing happens?...They're the sorts of things that I would be interested in just being able to see a new sport like that, or a variation of a sport like that, in action. I think it's important that we get to see it so that we can picture ourselves in it…Maybe if I saw what it was, then I'd be able to give it a fair judgment as to whether I can see myself doing it, or whether that's something that maybe isn't really for me.

Therefore, the perception of walking sports among the general public may rely to a large extent on its visibility and the nomenclature attached to such a novel form of sport, and the way in which these sports are described and advertised.

Overcoming a Fear of the Unknown. Another notable participation barrier linked with the novelty of walking sports was the lack of familiarity – interviewees were hesitant to participate alone in an activity where they were unsure of what to expect. Martin (age 40, bottom 10%, current sport participant) said:

> *I think it's just getting out to do something different and go somewhere where you don't know anyone, and you haven't played the exact sport before. I guess that would probably be the biggest [barrier] to be honest…I think it's just, you know, the motivation to do something new.*

Corresponding with the significance of subjective norms in predicting intentions to participate in a walking sport, as suggested in the quantitative findings, interviewees identified the critical role played by friends and family in initiating participation. Martin went on to add:

> *I think if you went along with a friend, you'd be much more inclined to go. I think you'd be more likely to stay just because the comfort level would be there already because you're there with someone that's familiar. So yeah, I definitely think that would help…I probably wouldn't go alone.*

Further, highlighting the facilitative role of family, Joanna (age 58, top 10%, no sport history) mentioned how she would like to accompany her husband to participate in walking sports to reduce the social barrier. By doing so, she hoped to improve his level of physical activity:

> *I come from quite an active background, [my husband] doesn't, so that's why I'm looking for something that will encourage him. Because while he recognises it's*

> *important, it's not something he's ever done. It would be nice to help with that process, because often people find it more difficult to try something out alone or by themselves.*

Once this initial hurdle was crossed, team membership may be mobilised to sustain participation. Maya (age 41, top 10%, past sport participant) said:

> *That's where you start to forge friendships, you know. It becomes bonding through positive reinforcement. And sometimes it feels a bit more like you're accountable to someone else then. If you've told someone you are going to be there next week, and if you don't show up, you almost feel guilty.*

These perspectives depict the importance of subjective norms, and support from loved ones, in enabling participation in physical activities such as walking sports.

Congruence Between Personal Physical Activity Needs and Sport Offering. Interviewees described their intentions to participate in walking sports in relation to the fit between their physical activity needs and what walking sport has to offer. Specifically, individuals were more inclined to consider participation in a walking sport if it satisfied what they were looking for from a physical activity. In line with our findings in phase one, individuals holding favourable attitudes towards walking sports expressed high intentions to participate in walking sports. For individuals drawn towards walking sports, the low-impact nature was particularly attractive – this adaptation provided an opportunity to participate in team sports within a safe environment. Maya (age 41, top 10%, past sport participant) said:

> *It sounds like something I might be interested in. With netball, if you run and turn suddenly and then you stop, it's not very good for your knees, but a walking version of netball is going to take that away…In that sense, I guess it sounds pretty alright to me.*

Contrastingly, to those less-inclined to participate, the low-impact was especially unappealing – these individuals were typically extremely active. Charles (age 37, bottom 10%, current sport participant) said:

> *Being a person who is still reasonably fit, I just like the challenge of maybe pushing yourself a little bit – that's attractive for me. So, taking that high impact out sort of changes things for me.*

We identified two key participant-related predictors pertinent to this congruence – age and prior sport experience. Typically, interviewees who expressed high intentions to participate in walking sports were relatively older in age (over 50 years of age), moderately active, and had previously played sport. Heidi (age 52, top 10%, past sport participant), who had played sport at an elite level before having to retire, said:

> *As you get older, you can't really perform, and a lot of people, like me, would still like to get out there and [play sport], so it would be awesome to do this sort of stuff when you can't [play sport] at an elite level anymore.*

Specifically, for those who had played team sport, the idea of team membership was particularly appealing. Matilda (age 53, bottom 10%, current sport participant) said:

> *I've always loved team sports; I like the teamwork. I like being part of a team, and being able to play the sport that maybe you did when you were a kid. The same but just walking.*

In contrast, those expressing low intentions to participate in walking sports either had limited sport experience and/or were satisfied with their current level of physical activity. Lydia (age 55, bottom 10%, no sport history) said:

> *I don't think that I need anything more than my walking and my fitness classes because I can do that quite easily. I don't have to meet up with people and follow someone else's timetable…I just like to do whatever I want to do.*

Nonetheless, those who were less inclined to participate in walking sports expressed positive attitudes in that they saw value in the activity for others, and potentially even for themselves in the future. Ryan (age 55, bottom 10%, current sport participant) said:

> *At this point in my life, probably not, but I think in the future definitely, as I start to slow down. I'm 56 this year, I'm starting to slow down a little bit so I can see myself in the next five years probably taking up something like that, as I start to slow down, definitely in the next 5 to 10 years I might [consider playing a walking sport].*

Therefore, the fit of the activity with each individual's unique needs and circumstances may determine to whom walking sport appeals.

Promoting Achievability of the Activity. Those inclined towards walking sport participation revealed having typically low self-efficacy in relation to physical activity, but a desire to be more physically active. We identified two participant-related predictors that may be relevant to self-efficacy – health and perceived physical capability. Health was noted as having a bidirectional link with intentions to participate in walking sports. For those inclined to participate in walking sports, improving health and well-being was a key motive. For those expressing health concerns, the walking element made walking sports a particularly appealing option – while these individuals expressed low self-efficacy for traditional sport participation, they felt that the demands of a walking sport were of an "achievable" level of activity. Joanna (age 58, top 10%, no sport history), who had a diagnosis of fibromyalgia, said:

> *Given my age and my fitness level…I have to be conscious of my energy at times. I had considered doing team sports, but to go and play something like netball or soccer or hockey, 90 minutes of running is no longer possible for me. I'm at the point where I'm not going to get to that level again in my lifetime, but to be able to do it at a walking pace is something quite different and very achievable…so it just ticked all my boxes really.*

Equally, it was noted that an individual's perceived physical capabilities would be pertinent to self-efficacy for walking sports. Heidi (age 52, top 10%, past sport participant) said:

> *[I would] probably [try it out], I just don't know, physically, whether I am capable of it. Like I said, I'm not very active anymore, so I don't run every day, I just walk the dogs, so it would be whether I'm feeling that way in my mind, whether I'm thinking I can't do this, or I can, so it's probably more mental things [that would stop me].*

To some degree, it was noted that interviewees' perceived physical capability relied on a supportive, social, participation environment. Isabel (age 42, top 10%, current sport participant) said:

> *I totally would, but I would also be conscious of the fact that I don't already know how to play [a sport]. I feel like if walking sport is a place where you don't feel like you're letting the team down by being no good at it, or having never done it before, that would make me come back, having this sort of non-threatening supportive group of people.*

However, in relation to physical distance, close venue proximity was preferred. Interviewees suggested that they would be especially encouraged to participate in walking sports if sessions were conducted at a walking distance away from their residence. Maya (age 41, top 10%, past sport participant) said:

> *If you're going to do walking sports, [you] have to have a sense of walkability…make it really localised so it's easy for you to just chuck on a pair of shoes and some gym gear and walk down to your local park and play.*

As such, achievability may be of relevance to walking sport participation. Hence, finding ways to promote achievability, whether in terms of self-efficacy or localised venues, for walking sports may encourage participation in such programmes.

4.4 Discussion

In this study, we adopted a two-step mixed-methods approach aimed at identifying personal, psychosocial, programme-related, and environmental predictors of middle-aged and older adults' intentions to participate in walking sports, using the social-ecological model. From our statistical analysis, we identified four (one personal, two psychosocial, and one programme-related) significant predictors – perceived health status, attitudes towards walking sport, subjective norms, and the maximum distance respondents were willing to travel to participate. Subsequently, from our thematic analysis, we also identified that the novelty of walking sports and individual differences in the appeal of physical activity were potential determinants of intention to participate in walking sports.

4.4.1 Personal Predictors

At the personal level, we found in the survey perceived health status to significantly predict middle-aged and older adults' intentions to participate in walking sports. This is consistent with existing literature exploring adults' physical activity through a social-ecological lens that suggests health perceptions and functional capacity as key personal predictors (Boulton et al., 2018; Thøgersen-Ntoumani, 2009). Meanwhile, other evidence suggests that aging adults reporting poor physical health and ability were less inclined to participate in sports – including walking sports (Cholerton et al., 2019; Jenkin, Eime, et al., 2018). Paradoxically, it has been noted that although sport participation improves physical health outcomes, it is typically healthy adults who see themselves as capable of participating in sport, and ultimately participate in sport (Jenkin, Eime, et al., 2018).

The importance of perceived health status was reinforced in our qualitative findings, specifically in relation to the individual differences in appeal of walking sports. In terms of congruence, Jenkin et al. (2017) suggested that such opportunities may be especially attractive for those who wish to remain active, enabling these individuals to positively

negotiate the aging process through sport participation. As highlighted by interviewees in our study, and supported by prior literature, self-efficacy may be important for walking sport participation, but also for physical activity more broadly (Cholerton et al., 2019; Thøgersen-Ntoumani, 2009). In the present study, and in existing literature more broadly, some aging adults expressed frustration that their poor health restricted their ability to participate in sport, especially if they had been fairly active in the past (Boulton et al., 2018). Self-efficacy can be further reinforced through the social environment – Cholerton et al. (2021) reinforced how accepting all ability levels has been attributed as an important influence in maintaining long-term participation. Therefore, given the reduced physical demands for participation (i.e., walking pace, low-impact, non-contact sport), walking sports may be uniquely positioned to foster self-efficacy for aging adults who may, for any reason, feel incapable of participating in traditional sports, but wish to be involved in sport. However, given the heterogeneity of this demographic group, and the importance of promoting achievability, walking sport programmes should cater to participants' abilities and needs. Supporting skill development and enjoyment may be vital to the experience of self-efficacy and long-term engagement of aging adults in walking sports.

In other studies, prior sport experience, physical activity, ethnicity, socioeconomic status, education, employment, and relationship status were noted as other relevant personal predictors of aging adults' physical activity engagement (Cholerton et al., 2019; Fleury & Lee, 2006; Olson et al., 2021). Elsewhere, differences in receptiveness to physical activity were noted based on gender and age – women and older adults were less inclined towards long-term physical activity participation (Thøgersen-Ntoumani, 2009). Our findings did not replicate these results. Such differences may result from the fact that our study assessed intentions to participate in a hypothetical sport offering rather than an actual offering, or one that participants might have previously experienced.

4.4.2 Psychosocial Predictors

At the psychosocial level, attitudes towards walking sports and subjective norms were significant predictors of middle-aged and older adults' intentions to participate in walking sports. These findings are in line with The Theory of Planned Behaviour, which emphasises the relevance of both attitudes and subjective norms in predicting intentions (Ajzen, 1991). Individuals holding positive views of physical activity and beliefs regarding health benefits of participation have been found to be more inclined to be physically active (Boulton et al., 2018; Fleury & Lee, 2006).

In line with existing research, and supported in our qualitative findings we noted that individuals who were initially attracted towards a walking sport typically had a history of physical activity and sport participation – these individuals tended to value the health benefits of participation and held strong sport identities (Cholerton et al., 2019). Also, interviewees noted that the lack of awareness and visibility of walking sports meant that they held unfavourable attitudes towards walking sports simply based on the name. The importance of awareness of walking sport has been previously noted as vital to initiating interest; correspondingly, a lack of awareness impeded or delayed participation (Cholerton et al., 2019). Cholerton et al. (2019) also noted that those who engaged in walking sport enjoyed the skill acquisition and tactical elements of the sport. Therefore, as highlighted in our findings, in order to attract new participants, it may be worth emphasising aspects of what a walking sport offers (e.g., skill acquisition) while also noting what is absent (i.e., running).

Interviewees also reinforced our statistical findings regarding the importance of subjective norms. Irrespective of prior (traditional) sport experience, given the novelty of walking sports, some individuals expressed social anxiety, apprehension, and uncertainty regarding what to expect from that type of sport activity. Prior research also indicates that openness to experience is inversely related to age, supporting the preference expressed by

these individuals for avoiding novel experiences (Donnellan & Lucas, 2008). Having to attend alone and socialise with a group of strangers was a major physical activity barrier – attending with a peer and encouragement from family have helped address this barrier in previous studies (Boulton et al., 2018; Cholerton et al., 2021). Furthermore, it may be especially important to ensure a welcoming and supportive environment in such activities, and harness support from loved ones, to encourage engagement from those who may be socially inhibited, hesitant, or contemplating sustained participation. In Western cultures, participation in sport is highly regarded for health and other benefits – this contributes to positive norms surrounding sport participation (Gard & Dionigi, 2016). Nonetheless, age-related stereotypes regarding appropriate sport participation are widespread, and a recent systematic review indicated that addressing age-related stereotypes was associated with improved physical activity and self-perceptions of aging (Knight et al., 2022). Therefore, reducing the salience of age-related stereotypes may foster positive subjective norms, thereby encouraging sport participation for this demographic group.

Social support and perceived behavioural control were not identified as significant predictors of intentions to participate in walking sports. Our findings for social support were largely in line with that of a meta-analysis that indicated high variability in effect sizes and inconclusive associations between social support and physical activity (Scarapicchia et al., 2017). These findings suggested that the timing and context of social support may be important to consider – when socially supportive behaviours of others are misinterpreted to be controlling or coercive, there may be negative implications for physical activity (Scarapicchia et al., 2017). Nonetheless, although prior research indicates that perceived behavioural control may be a strong predictor of adults' physical activity intentions (Stolte et al., 2017), our findings did not support such associations. Differences may be a result of the fact that we focused on middle-aged and older adults, and as such, the mean age of

participants in our study (M_{age} = 46.08) was significantly lower than of prior research that focused primarily on older adults (M_{age} = 72.20; Stolte et al., 2017). Perceived behavioural control for walking sports may be particularly important to older adults, who may be especially vulnerable to reduced functional capacity, to a greater extent than middle-aged adults.

4.4.3 Programme-Related and Environmental Predictors

At the programme level, the maximum distance respondents were willing to travel was a significant predictor of intentions to participate in walking sports. This suggests that the more people were willing to travel to access a walking sport programme, the more they intended to participate. This contradicts existing literature where aging adults expressed a preference for venues that are in close proximity to their home and could be accessed easily (Boulton et al., 2018). Our qualitative findings aligned with past research – although interviewees expressed a preference for venues in close proximity. Taken together, our findings indicate that, although close proximity may be ideal, those inclined to participate in walking sports, may be willing to travel a reasonable distance to access a programme. Our findings may be explained by the fact that an overwhelming majority of respondents reported having their own personal vehicle rather than relying on shared transportation, which may permit increased accessibility of distant venues.

None of the other programme-related predictors were identified as relevant to intentions to participation in walking sports. Aging adults may be a heterogenous group, having diverse preferences regarding programme-related features, and hence, requiring a variety of strategies to encourage physical activity engagement (Olson et al., 2021; Thøgersen-Ntoumani, 2009). Notably, despite existing literature highlighting cost as key participation barrier (Jenkin et al., 2017), this was not supported in our present findings. This may be because approximately two-thirds of respondents earned above the median personal

income in the country. Finally, socio-economic (dis)advantage and neighbourhood environment were not found to be relevant predictors of intentions to participate in walking sports. This finding is in contrast to a review that suggests that neighbourhood safety, including the presence of appropriate footpaths, was positively associated with physical activity (Humpel et al., 2002). These differences may be attributed to the large proportion of individuals in our sample living in areas rated in the upper half of the IRSAD – features of the neighbourhood such as crime, safety, and appropriate facilities may be irrelevant to those living in wealthier neighbourhoods.

4.4.4 Strengths and Limitations

In term of strengths, our research is the first mixed-methods investigation of the predictors of walking sport participation for middle-aged and older adults. We highlighted the significant predictors of walking sport participation, and gained insight into why these predictors may be contextually relevant to the target group. Furthermore, while previous investigations have primarily focused on personal and psychosocial predictors, the social-ecological approach permitted us to simultaneously examine predictors of intentions to participate in walking sport at various (i.e., personal, psychosocial, programme-related, and environmental) levels of the social-ecological model. Finally, to complement existing research pertaining to the experiences of walking sport participants, another original contribution of our study is that we considered the perspective of the general population who fit the target population (in terms of age) but had no prior experience with walking sport participation. This allowed us to consider diverse perspectives regarding the extent to which walking sport is appealing to a wider range of potential participants. This information is especially relevant in order to support the growth of walking sport programmes in ways that are acceptable and sustainable in the long run.

While interpreting the findings of the present study, there are some limitations that need to be considered. The quantitative data were obtained using a cross-sectional self-report online questionnaire, limiting our ability to make causal inferences. Also, we examined only a subset of potential predictors that were identified as relevant within prior walking sport and physical activity research – the importance of other predictors that have not been included in the present study may still need to be considered within future research. Furthermore, perhaps as a result of utilising an online survey method, the mean age of respondents was on the lower end of the middle-aged and older adult spectrum (M_{age} = 46.08, SD = 9.75). Therefore, we are unsure as to the extent to which our findings apply to those at the higher end of the age spectrum. It is important to emphasise that our findings may not adequately represent views from less educated, lower socio-economic, and non-Caucasian ethnic groups. Also, worth noting is that the physical activity levels of our sample were generally higher than, and may not be representative of, the general population. It may be that those who were more active were more inclined to participate in a study focused on sport participation. Nonetheless, our findings are generally in line with existing literature, including studies with older age groups (Boulton et al., 2018; Cholerton et al., 2019; Jenkin et al., 2017). Finally, our findings relate to the predictors of intentions to participate in walking sports; therefore, we are unable to examine predictors of actual walking sport participation (i.e., behaviour). Future research may wish to investigate predictors of actual walking sport participation.

4.4.5 Applied Implications

Our findings may carry practical utility in terms of the appeal, feasibility, and sustainability of community-based walking sport programmes. Firstly, in terms of programme recruitment and advertising, interviewees highlighted two key perspectives. The first was the lack of visibility of walking sports, which precluded participation. Once the visibility hurdle was crossed, the second deterrent was the negative framing of the activity. Age-related

stereotypes have notable implications for physical activity engagement (Knight et al., 2022). Therefore, it may be beneficial to reframe the description of walking sports as being skill-focused rather than lacking cardiovascular exertion. This may reduce the salience of age-related stereotypes (and improve attitudes and subjective norms) in relation to walking sports, thereby increasing its appeal to middle-aged and older adults.

Secondly, in terms of feasibility, in addition to fostering positive attitudes (as suggested above), it would be necessary to target segments of the population who may be more inclined to participate in walking sports. Specifically, it may be advisable to focus on individuals who are seeking a low-impact team-based physical activity option. Further to this, accentuating the achievability of activity involved, as well as the team membership and social element of such programmes (i.e., a welcoming and non-judgmental environment), may be advantageous in attracting new participants who may be otherwise less inclined to participate (Corepal et al., 2020).

Finally, in terms of sustainability, the programme environment may play a vital role. Given that interviewees highlighted the importance of perceiving self-efficacy for walking sports, in line with social learning theory, it may be imperative for participants to experience success (i.e., performance accomplishments) early on to support sustained participation (Lee et al., 2008). Correspondingly, it may be worthwhile for organisers to cultivate a supportive environment that permits participants to experience self-efficacy. In line with existing physical activity research, promoting a motivationally supportive environment that permits participants to experience autonomy, competence, and relatedness, may reinforce the positive experiences and long-term participation within such programmes (Hancox et al., 2018).

4.5 Conclusion

Our research, adopting a mixed-methods approach, has investigated middle-aged and older adults' intentions to participate in walking sports. Using quantitative data, we identified

perceived health status, attitudes towards walking sport, subjective norms, and the maximum distance respondents were willing to travel to participate as key predictors of intentions. Using qualitative data, we found that the novelty of walking sports and individual differences in the appeal of physical activity may explain why these predictors were important. Overall, our findings support the utility of the social-ecological approach in predicting middle-aged and older adults' intentions to participate in walking sports. Together, these findings offer insight into the complex interplay of personal, psychosocial, programme-related, and environmental predictors of middle-aged and older adults' intentions to participate in walking sports. Addressing these elements of a walking sport programme would make such programmes more appealing to potential participants, and ultimately, more feasible and sustainable to conduct in the long run. Policymakers may wish to consider these findings to promote physical activity and health in aging adults.

Chapter 5: Thesis Discussion

Insufficient physical activity is considered a global public health challenge. Given that a majority of middle-aged and older adults are insufficiently active, and insufficient physical activity is associated with poor physical and mental health (AIHW, 2020; Cunningham et al., 2020; Hallal et al., 2012), there is a growing need to identify ways to engage this age group in physical activity. Although sport participation has the potential to increase physical activity in middle-aged and older adults, there are few appropriate sport opportunities that cater to the ageing adult demographic group. The purpose of this thesis was to understand the potential of sport (and specifically walking sport) programmes to promote health-enhancing physical activity and psychological well-being in middle-aged and older adults. To this end, Chapter 2 aimed to assess existing evidence pertaining to the psychosocial outcomes of sport participation for middle-aged and older adults through a systematic review and meta-analysis. Given the recent expansion of walking sports, Chapters 3 and 4 sought to assess their potential to engage middle-aged and older adults in physical activity. Using interviews, Chapter 3 aimed to explore the experiences of multi-stakeholders involved in community-based walking sport programmes in Australia. Adopting a mixed-method approach, Chapter 4 aimed to examine the social-ecological predictors of middle-aged and older adults' intentions to participate in walking sport programmes. This chapter will outline the overall contribution of the findings of this thesis to the literature, strengths, and limitations of this thesis, and propose recommendations for future research, policy, and practice.

5.1 Summary of Thesis Findings

5.1.1 Chapter 2

Several meta-analyses have outlined the physiological benefits, encompassing metabolic, cardiovascular, and musculoskeletal outcomes associated with sport participation (Krustrup et al., 2010; Luo et al., 2018; Milanović et al., 2019). Narrative systematic reviews

have concluded that sport participation may be associated with psychological and social benefits for middle-aged and older adults (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020). These reviews also proposed several moderators of this association, indicating that characteristics of the sport (e.g., team/individual, competitive/recreational) and participant (e.g., age, gender) may be implicated in the extent to which such benefits are experienced (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020). However, these suppositions have not been statistically synthesised. Chapter 2 was the first systematic review and meta-analysis (k = 25) of its kind examining the psychosocial outcomes of sport participation for middle-aged and older adults.

A small, significant association between sport participation and psychosocial outcomes was observed. Differences were noted for different types of outcomes – small to moderate effect sizes were observed for social, positive psychological, perceived physical, and cognitive outcomes. No significant effects were observed for negative psychological outcomes. Results also showed that none of the tested characteristics of the sport (i.e., type, context, variation) and participant (i.e., gender, age, health status) moderated the association between sport participation and psychosocial outcomes. These findings highlighted that ageing adults could participate in any form of sport and still experience (modest) physical, positive psychological, cognitive, and social benefits.

Overall, findings from Chapter 2 confirm the association between sport participation and psychosocial benefits indicated by prior narrative systematic reviews (Andersen et al., 2019; Eime et al., 2013; Gayman et al., 2017; Kim et al., 2020). However, the meta-analysis did not provide support for the proposed moderators of this association. Worth noting is that a large proportion of the included primary studies were either insufficiently powered or inconsistently reported moderator variables of interest, and as such, moderation analyses may have been underpowered to detect significant effects. Extending past literature, the present

findings highlight the dissimilar effects observed for different types of psychosocial outcomes – although sport participation may not reduce negative psychological outcomes such as depression and anxiety, the noted benefits for positive psychological and social outcomes could help buffer the negative outcomes and improve participants' quality of life. Nevertheless, a significant proportion of heterogeneity in the effect sizes remained unexplained. Other potential moderators, such as those that were underpowered and/or inconsistently reported in the primary studies, may explain this heterogeneity. For instance, participants' (physical and mental) health status was inconsistently reported in the literature, and could potentially explain heterogeneity in effects, thus warranting further attention. Given the heterogeneity in psychosocial benefits of sport participation for middle-aged and older adults, there is a need to identify and offer a variety of physical activity (and specifically sport) opportunities for this age group that could enable the experience of these identified benefits.

5.1.2 Chapter 3

Despite the rapid expansion of walking sports globally, limited research has considered the potential of community-based walking sport programmes to serve as a viable means to engage ageing adults in physical activity. Preliminary evidence from the United Kingdom (Kinnafick et al., 2021; McEwan et al., 2018; Reddy et al., 2017) indicates that walking sports may be acceptable and feasible in community-based settings, and that participation is associated with physical and psychosocial benefits. However, these studies largely focused on the perspectives of those who participated in such programmes and are not necessarily generalisable or relevant to the Australian context, where public health efforts to boost physical activity and sport participation rates have been less successful than in the United Kingdom (Alexander, 2017). Perspectives of other key stakeholders (i.e., individuals who serve as decision-makers and programme facilitators) have been largely neglected in the

international literature – such consideration is essential to gather a holistic understanding of implementation and delivery of walking sport programmes, and discern whether expectations imposed on different stakeholders are appropriate, feasible, and sustainable in the long run (Biddle et al., 2022).

Chapter 3 focused on the perspectives of multi-stakeholders involved in community-based walking sport programmes. Using a qualitative approach, the experiences of key stakeholders involved in walking sport programmes were explored (i.e., decision-makers, facilitators, and players). Semi-structured one-to-one interviews were conducted with individuals (n = 21) who identified as decision-makers, facilitators, and/or players (in some cases, participants served multiple roles). The aim of this exploration was to holistically understand the extent to which such programmes are appealing to, and appropriate for, ageing adults (aged 35 years and older). Using reflexive thematic analysis (Braun & Clarke, 2019a), four key themes were identified in relation to acceptability, feasibility, and sustainability of walking sport programmes. Participants highlighted the 'renewed lease of life' that walking sport participation provided, but also noted that ageing stereotypes were rampant and required careful navigation to feel comfortable to participate in such programmes. Findings also highlighted that, at times, organisations and players held conflicting perspectives regarding the purpose of walking sports, individuals' motives and needs, and competing financial interests – these conflicts seemed to influence the delivery and uptake of walking sport programmes. Facilitators of walking sport programmes were identified as 'catalysts of success' – those occupying facilitator roles were uniquely positioned to understand and address challenges faced within their specific programme, striking a balance between participants' needs and organisational demands.

Overall, the findings of Chapter 3 enhanced understanding of walking sport programmes through a holistic exploration of key issues relating to acceptability, feasibility,

and sustainability, highlighting the incompatibility between different stakeholders' perspectives. The results added to understanding of ageism in community-based sports via multi-stakeholder perspectives. Specifically, findings highlighted the different forms of ageism that middle-aged and older adults navigate in the context of walking sport participation, including overt discrimination from other stakeholders (e.g., decision-makers' prioritisation of elite sport), implicit biases (e.g., programme design in accordance with decision-makers' and facilitators' perception of ageing adults' needs aligned with narratives of age-related decline), and internalised stereotypes (e.g., ageing adults' self-perceptions of age-appropriate activities, as described previously). From these findings, some recommendations are made (at the end of this chapter) to support the future implementation of community-based walking sport programmes.

5.1.3 Chapter 4

The extant walking sport literature has primarily focused on the perspectives of participants already involved in walking sports. However, in order to understand the potential of walking sports to promote physical activity, it is important to consider the perspectives of individuals who do not participate in such forms of sport. Such insight can provide a less biased and more balanced insight into the potential of walking sport programmes to appeal to the broader population. Equally, understandings of determinants of health behaviours have evolved to move away from identifying and modifying individual determinants of health behaviour, towards a more comprehensive and holistic understanding of the variety of social-ecological factors that predict individual behaviour (e.g., Biddle et al., 2022; Boulton et al., 2017). Hence, Chapter 4 assessed the potential appeal of walking sport programmes through an examination of the social-ecological predictors of middle-aged and older adults' intentions to participate in walking sport programmes.

Using an explanatory sequential mixed-methods approach, ageing adults' intention to participate in walking sport programmes was assessed in two phases. In phase one, an online questionnaire was administered to middle-aged and older adults (n = 282) to identify significant predictors (across personal, psychosocial, programme-related and environmental levels of the social-ecological model) of intentions to participate in walking sports – perceived health status, attitudes, subjective norms, and distance of venue were significant predictors of intentions. In phase two, a subset of questionnaire respondents (scoring in the top and bottom 10 percentile on intentions to participate in walking sports; n = 17) were interviewed. Four key themes that explained the relevance of the four significant predictors were identified. First, it was noted that the assumptions (or stereotypes) associated with name 'walking sport' deterred participation. Second, there seemed to be a general fear of the unknown regarding what participation would entail. Third, the alignment between characteristics of walking sport programmes (e.g., low impact, non-competitive) and an individual's physical activity needs/preferences was instrumental to whether walking sport was of interest. Finally, perceptions of self-efficacy for walking sports, seemed especially particularly important to ageing adults' intentions to participate in walking sports. In conclusion, these findings indicate that promoting engagement in walking sports, and physical activity more broadly, is fairly complex and requires consideration of the multitude of influences (spanning personal, psychosocial, programme-related, and environment factors) that may predict an individual's desire and ability to engage in a specific behaviour. To this end, recommendations for future research, practice, and policy are offered at the end of this chapter.

5.2 Common Threads

5.2.1 Heterogeneity in Ageing Adults

Contemporary views challenge the dominant narratives of ageing as a period of physical decline and social isolation, and have emphasised the diversity in ageing adults' experiences in the context of health, physical activity, and sport participation (e.g., Ferrucci & Kuchel, 2021; Nguyen et al., 2021; Phoenix & Smith, 2011). The findings of this thesis extend our understanding of the heterogeneity in ageing adults with reference to physical activity and sport participation. Essentially, a "one size fits all" approach to sport programmes may insufficiently address the physical activity needs for this age group.

The findings of Chapter 2 reinforce the heterogeneity in ageing adults' experiences with sport participation – there was a large proportion of unexplained heterogeneity in the observed effects. The findings of Chapter 3 demonstrate the varied experiences of ageing in the context of walking sport participation emphasising the need to move away from discourses of functional decline in relation to ageing. Findings also detail the tensions arising from the lack of consideration of, and accommodation for, the diversity in ageing adults' motives by key decision-makers, who instead tended to perceive the target audience as homogeneous (in a manner laden with age-related stereotypes). The findings of Chapter 4 illustrate the complexity of participation in physical activity for ageing adults in the specific context of walking sports. Results showed that a variety of factors across the different levels of the social-ecological model collectively predict ageing adults' preference and ability to engage in walking sports. Furthermore, findings highlight the need to take into account the various personal, psychosocial, programme-related, and environmental predictors that are relevant to the individual, and the fit between the activity and the individual.

5.2.2 Social-Ecological Considerations for Physical Activity Promotion

An individual's preference for and ability to engage in a specific behaviour is complex, and there is a need to acknowledge the wider contextual factors that may contribute to these choices (King & Gonzalez, 2018). The social-ecological model provides a structured, yet flexible framework to understand the interrelations of the multitude of factors that may predict individuals' inclination towards certain behaviours. The findings of the present thesis highlight the relevance of the social-ecological model in understanding physical activity behaviours of ageing adults, specifically in the context of walking sports.

The findings of Chapter 2 demonstrate that there is considerable heterogeneity in the association between sport participation and psychosocial outcomes that remains unexplained, even after moderation analyses – characteristics of the sport and participant did not moderate the association between sport participation and psychosocial outcomes. This unexplained heterogeneity may be a result of inconsistencies in measurement and reporting of study variables and demographic details, emphasising the need for consistent reporting of such information in the literature. Alternatively, this finding may indicate the need to view individuals within their unique context, and consider the broad range of psychosocial, structural, and policy factors that may be implicated in an individual's physical activity choices and outcomes. The findings of Chapter 3 drew attention to the contrasting experiences of different stakeholders involved in walking sport programmes. Specifically, the multi-stakeholder approach highlighted discrepancies between participants' (i.e., individual and psychosocial levels), facilitators' (i.e., programme-related level), and decision-makers' (i.e., organisational and policy levels) perspectives. For instance, decision-makers were largely oblivious to the diversity in ageing adults' participation needs and motives, thereby limiting the ability of sport organisations to adequately cater to the intended target population. Therefore, the conflict between individuals occupying/influencing the different

levels of the social-ecological model may limit the uptake of walking sport programmes. Using the social-ecological model, the findings of Chapter 4 highlight that a collection of factors across various levels of the social-ecological model predict intentions to participate in walking sports. Subsequent follow-up interviews with participants provided further insight regarding the nuances in terms of the fit between the activity and individual, thereby reinforcing the need to view individuals' physical activity choices within their unique contexts.

5.3 Theoretical Implications

Given the need for a systemic approach to physical activity and health behaviour change, the social-ecological model was the dominant theoretical framework that guided this thesis. However, several complementary theories (e.g., Theory of Planned Behaviour, Self-Determination Theory, Social Cognitive Theory) were woven into the thesis as relevant to each level of the social-ecological model. The use of multiple theories throughout this thesis has enabled detailed insight into some of the different processes involved in health behaviour change that may not have been possible by limiting the frame of reference to a single theoretical approach.

5.3.1 Understanding Contextual Predictors of Physical Activity

Prior research highlights that a multitude of correlates across the different levels of the social-ecological model predict physical activity behaviours (e.g., Bauman et al., 2012; Boulton et al., 2017; Thornton et al., 2017). Findings presented in Chapters 2, 3, and 4 all provide support for the utility and relevance of the social-ecological model and reinforce that contextual factors determine why individuals may (or may not) be inclined to participate in a specific physical activity/sport. A systematic review noted that most health promotion interventions were carried out at the individual and/or interpersonal levels; interventions

targeting environmental and policy levels or multiple levels of the social-ecological model simultaneously were rare (Golden & Earp, 2012). There is a need for an integrated approach that brings the built environment and public health policy in alignment with physical activity recommendations (Haggis et al., 2013) because these structural factors are known to contribute to physical activity behaviours, even after accounting for demographic and psychosocial factors (Saelens et al., 2012). Overall, these findings draw attention to the need to direct focus not just to individual determinants of health behaviours, but to also consider broader contextual (i.e., psychosocial, programme-related, environmental, policy, and societal) factors that may either foster or limit an individual's preference for and ability to engage in a physical activity/sport programme. When attempting to implement public health initiatives to promote physical activity, it would be important to conduct an assessment through a social-ecological lens to determine and address contextual factors that may require adaptation to suitably engage the intended target population. The efficacy and sustainability of such community-based initiatives requires concordance between the target population, other key stakeholder, and public health policy. However, in practice, multi-level interventions that require changing public health policy and facets of the built environment, can be particularly challenging and may not always be feasible to implement. Therefore, ultimately, matters such as feasibility and practicality may restrict the scope of such large-scale interventions. Nonetheless, a viable means to address contextual factors would be to involve consumers representing the intended end users of physical activity programmes in the design and implementation from the outset. Increased involvement of consumers and stakeholders in development of public health policy and in decision-making concerning physical activity programmes will also help to address the aforementioned issues.

5.3.2 Fostering Need-Supportive Participation Environments

Aligned with Self-Determination Theory (Ntoumanis et al., 2021; Ryan & Deci, 2017), which emphasises the role of the basic psychological needs (i.e., autonomy, competence, and relatedness) and need-supportive environments in nurturing intrinsic forms of motivation, Chapter 3 provides support for the significance of need-supportive participation environments within walking sport programmes. Prior research identified that social environments that supported the basic psychological needs of autonomy, competence, and relatedness were important influences on autonomous forms of motivation for health behaviours (Ntoumanis et al., 2021; Ryan & Deci, 2017). Contrastingly, Ntoumanis et al. (2021) noted that social environments that thwarted these psychological needs were associated with more controlled form of motivation for health behaviours. Literature drawing from Self-Determination Theory (e.g., Hancox et al., 2018) further suggests that behaviours of significant others (e.g., family members, health practitioners, and physical activity facilitators) were important in fostering psychological need satisfaction and self-determined forms of motivation for health behaviours such as physical activity engagement. The findings of the present thesis provide support for tenets of Self-Determination Theory as it applies to facilitators of physical activity interventions/programmes. Specifically, walking sport participants indicated that when facilitators demonstrated need-supportive behaviours (e.g., listening to their concerns, reassuring them, and suggesting suitable adaptations), they felt particularly comfortable and confident to participate the programme – in other words, they experienced satisfaction of the basic psychological needs. Further, these participants reported having autonomous forms of motivation, such as enjoyment, to sustain walking sport participation in the future. van Stralen et al. (2009) also argued that enjoyment and support from sport instructors were important determinants of maintenance of sport participation among older adults. These findings demonstrate the pivotal role played by facilitators in

supporting participants health behaviours, specifically in the context of walking sport engagement – programme facilitators may be best placed to support engagement if they demonstrate need supportive behaviours towards participants.

5.3.3 Predicting Intentions: The Importance of Attitudes and Subjective Norms

In Chapter 4, findings indicated attitudes towards walking sports and subjective norms of walking sport participation to be relevant predictors of middle-aged and older adults' intentions to participate in walking sports. This result furthers evidence in support of the Theory of Planned Behaviour (Ajzen, 1991), which has been frequently used to explain individuals' intentions towards health behaviours (including physical activity). While meta-analyses have indicated that all the constructs within the Theory of Planned Behaviour model held utility in predicting intentions and subsequent health behaviours (Hagger et al., 2002; Downs & Hausenblas, 2005), the findings of Chapter 4 found only attitude and subjective norms to predict intentions to participate in walking sport. Respondents may have found it challenging to estimate how much control they might have over a behaviour in which they have not previously engaged. Alternatively, as the mean age of respondents was on the lower end of the 'middle-aged and older adult' spectrum (M_{age} = 46.08), perceived behavioural control for physical activity could potentially be of greater importance to older adults (i.e., aged 65 years and older) who may experience age-related functional changes. Hence, it may be important for physical activity initiatives to provide due consideration to such demographic determinants and the adaptations (e.g., replacing running with walking as in the case of walking sports) that may be required to engage demographic groups (e.g., older adults) that may otherwise perceive low behavioural control and are known to engage in physical activity to a lesser extent (Hallal et al., 2012; Jenkin et al., 2017).

5.3.4 Internalised Stereotypes and Sport Participation in Ageing Adults

The findings of Chapter 3 explore ageing adults' experiences navigating age-related stereotypes in the context of walking sport participation. In addition to the stereotypes imposed by external sources, walking sport participants seemed to hold internalised age-related stereotypes, which appeared to influence their perspective on walking sport participation, and physical activity more broadly. Stereotype Embodiment Theory (Levy, 2009) offers insight into how continued exposure to age-related stereotypes may lead to internalisation of such stereotypes and influence self-perceptions of ageing. Therefore, in the context of physical activity and sport participation, societal expectations and opinions pertaining to the age-appropriateness of a specific physical activity may influence its uptake. The present findings add to our understanding of internalised stereotypes and indicate that, for some participants, walking sports were attractive as the level and form of physical activity (i.e., low impact, non-competitive sport) was age-appropriate and socially acceptable. These findings draw attention to a strategy to promote health behaviours (i.e., by capitalising on internalised stereotypes that individuals may hold) and highlight an important aspect of acceptability of walking sports in the context of socialisation and societal norms.

5.3.5 Self-efficacy, Sport, and Ageing

The findings of Chapters 3 and 4 pinpoint to the role of self-efficacy in encouraging walking sport participation. These findings contribute to the empirical basis of the Social Cognitive Theory (Bandura, 2004) that emphasises self-efficacy as the key determinant of task-oriented behaviours, including physical activity. Self-efficacy is a sub-component of perceived behavioural control (discussed earlier). Ajzen (2011) conceptualised perceived behavioural control as an overarching construct comprised of self-efficacy (i.e., perceived difficulty and confidence in one's own ability to perform a behaviour) and controllability (i.e., the extent to which the behaviour is under the individual's control). Aligned with meta-

analytic data (Young et al., 2014), the findings of the present thesis suggest that self-efficacy may be particularly important for predicting physical activity in ageing adults. As noted above, cultivating need-supportive environments that enable participants to experience competence would also instil a sense of self-efficacy for physical activity, thereby contributing to sustained physical activity behaviours. The present thesis applies the tenets of Social Cognitive Theory in a new context (i.e., walking sport participation) and its findings illustrate how cognitive constructs such as self-efficacy could play a vital role in behavioural maintenance, particularly regulatory processes such as sustaining physical activity engagement. Yet, self-efficacy may be equally important for behavioural initiation, supporting re-engagement of ageing adults in sport, especially those with prior sport experience who may have reduced physical capabilities. Such re-engagement would in turn reinforce self-efficacy for sport participation, thereby enabling the retention of a sport identity (e.g., perceiving themselves as still being a skilled player).

5.4 Methodological Strengths

The key methodological strength of this thesis is the usage of both quantitative and qualitative methods to further understanding of (walking) sport participation in ageing adults. As noted in Chapters 3 and 4, the research paradigm underpinning this thesis differed across the studies presented. This shift in paradigm was in part due to the varied paradigms from which the researchers involved in this project operated, and the different research questions that this thesis aimed to address. While these paradigms were, at times, incompatible, a key strength of this thesis was the opportunity to draw from these diverse viewpoints and interpret meaning from different types of data. The meta-analytic method adopted in Chapter 2 enabled a comprehensive synthesis of the psychosocial outcomes of sport participation and potential sources of heterogeneity of this association – the three-level approach allowed for dependencies in effect sizes from the same study to be accounted for within the analysis.

Given the limited research on multi-stakeholder experiences, the inductive approach to reflexive thematic analysis adopted in Chapter 3 enabled an in-depth and contextual understanding of individuals' experiences in relation to walking sports. The multi-stakeholder approach allowed for the consideration of diverse perspectives to provide a holistic understanding of the experiences, appeal, implementation, and delivery of community-based walking sport programmes. By utilising semantic and latent codes, data analysis was able to uncover interviewees' experiences, as well as some underlying assumptions that may contribute to their perspectives. Chapter 4 utilised an explanatory sequential mixed-methods design which yielded several benefits. The quantitative findings contributed to participant selection for the qualitative phase – as such, individuals who were either extremely inclined either towards or against walking sport participation were interviewed, highlighting both equally important perspectives. Furthermore, having two components, a quantitative phase followed by a qualitative phase not only provided the opportunity to explore the quantitative findings in comprehensive detail, but also enabled contextualisation of the quantitative findings. Taken together, the different qualitative and quantitative methods adopted within this thesis helped fill some important gaps in the literature pertaining to the outcomes of sport participation, and the potential of walking sports to promote physical activity, in middle-aged and older adults.

5.4.1 Reflecting on the Shift in Philosophical Positioning

There is a shift in the philosophical positioning and the ways in which generalisability is understood across the studies presented in this thesis. The aim of Chapter 2 was to gain an objective understanding of the association between sport participation and psychosocial outcomes, and hence, this chapter was framed by a positivist philosophical positioning. In doing so, the focus was on statistical generalisability to make broader inferences regarding representativeness of findings. The aim of Chapter 3 was to understand and interpret meaning

of walking sport experiences, and hence, this study was underpinned by a constructivist philosophical positioning. In this study, thick descriptions were provided alongside the presented findings in order to facilitate transferability, or the extent to which these findings can relate to other settings (Smith, 2018). The aim of Chapter 4 was to combine multiple methods and sources of evidence to improve understanding of walking sports, and hence, this study adopted a post-positivist philosophical positioning. Given the explanatory sequential mixed-methods approach utilised in this study, and in attempting to identify key predictors of intentions to participate in walking sports, the focus was once again on statistical generalisability. Additionally, in adopting a systemic approach, analytical generalisation, where established concepts and theories are investigated using different methodologies in order to demonstrate their generalisability, was also sought (Smith, 2018).

This shift in positioning was in part due to the varied paradigms from which the researchers involved in this project operated, and the different research questions that this thesis aimed to address. However, to a large extent, this shift can be attributed to my own evolving worldview as an early career researcher. In leading the studies presented in this thesis, I commenced my research journey with Study 1 in my comfort zone – having worked solely with quantitative data previously, a meta-analysis fit with the positivist philosophical positioning I held at the time. However, in gaining increased exposure to researchers operating from a constructivist paradigm, I began to recognise the value of qualitative research in addressing some key research questions (including some research questions explored in this thesis), and therefore, the subsequent studies in this thesis involved some qualitative elements. Yet, in adopting a constructivist positioning in Study 2, upon reflection, I felt that I did not entirely dismiss the relevance of quantitative data and the (post)positivist paradigm. Instead, I recognised that my philosophical positioning acknowledged the importance of different forms of data and philosophical positionings, and how these

dissimilar perspectives and methods can co-exist to address research questions from different points of view. Therefore, over the journey of completing this thesis, upon further reflection, I would now describe my worldview and philosophical positioning as aligned with pragmatism (Goldkuhl, 2006). My primary interest remains in action-oriented research that seeks to better understand real-world challenges and drive social change concerning physical activity and health promotion. Hence, recognising that different approaches may be useful to fully understand phenomena, going forward I would be inclined to choose methods of data collection and analysis that are appropriate to best address a specific research question (Biddle & Schafft, 2015; Creswell, 2014).

5.5 Limitations and Recommendations for Future Research

The findings of the present thesis are not without limitations. Some key limitations and recommendations for future research to extend the findings of this thesis are outlined below.

5.5.1 Inferences of Causality

Causality cannot be inferred for the findings in the present thesis. In Chapter 2, it is important to highlight that a majority of included studies involved self-report measures and adopted cross-sectional designs. Hence, the direction of the association between sport participation and psychosocial outcomes cannot be confirmed by the meta-analytic findings. In a similar vein, a cross-sectional design was used to obtain quantitative data in Chapter 4 and as such direction of the association between social-ecological predictors and intentions cannot be assumed. Further, self-report measures are prone to overestimation or underestimation (Dang et al., 2020); participants may be more inclined to provide a socially desirable response rather than being truthful about their psychological and social circumstances (e.g., depression, social isolation). In Chapters 3 and 4, although interviews were used to gather data, humans can be biased in decision-making and experience errors of

judgment (Johnson et al., 2013). As such, although qualitative findings provide insight into *perceived* causality, this cannot be assumed to be the same as *actual* causality. Future research would benefit from conducting more long-term follow ups to examine the longevity of the observed effects and from adopting more rigorous methods such as randomised controlled trials which would enable a clearer understanding of causality in the association between sport participation and psychosocial outcomes. When randomised controlled trials are impractical or unethical to conduct, quasi-experimental longitudinal studies, where participants who opt in to walking sport programmes are compared against a control group of community-dwelling non-participants over an extended period of time, may be a more appropriate means to investigate the association between sport participation and outcomes.

5.5.2 Generalisability

The generalisability of the findings of this thesis may be limited in some ways. Chapters 3 and 4 have primarily involved participants who were living in Australia, were healthy, community-dwelling, identified as Caucasian, and reported high levels of education and socio-economic status. This limits the generalisability of the findings outside the Australian context and may not adequately represent the perspectives of other demographic groups (i.e., non-Caucasian, lower socio-economic, and less educated individuals) that are typically underrepresented in research and underserved in community-based physical activity initiatives (Lorenc et al., 2013). The underrepresentation of these demographic groups in such sport programmes also meant that recruiting such individuals to the present research was particularly challenging. Nonetheless, an important gap is highlighted in that more work needs to be done in the way of engaging such underserved groups that tend to be especially hard to reach. Future research needs to specifically explore experiences of and barriers to physical activity and sport participation for underserved groups in order to design and implement physical activity initiatives in line with their specific needs and values. Such

research is vital to diminishing inequities in community-based health initiatives that, when implemented without due consideration, may inadvertently serve to augment health inequalities (Birch et al., 2022; Lorenc et al., 2013).

5.5.3 Physical Activity Maintenance

A key limitation of the present thesis and prior literature is that understanding of long-term physical activity engagement (i.e., maintenance) is limited. As the majority of walking sport players who were interviewed in Chapter 3 had maintained participation (i.e., engaged for 6 months or longer), the findings could not draw out the psychological processes of these individuals that may have differed from those who dropped out from walking sport programmes (as these individuals could not be recruited to study participation). While Chapter 4 provides insight into some factors that could support initiation, the psychological processes underlying initiation and maintenance of behaviours vastly differ, and hence, need to be investigated separately. For instance, while self-efficacy and outcome expectations may support adoption of physical activity behaviours (Paganini et al., 2022), cognitive self-regulatory resources and habituation may be especially important to behavioural maintenance (Kwasnicka et al., 2016). In order to support sustained behaviour change, further insight into behavioural maintenance in the context of physical activity initiatives (and specifically walking sports) is warranted. Future research needs to consider strategies to support maintenance of physical activity behaviours (e.g., utilising behaviour change techniques) including sustained engagement in walking sports. In the same vein, it would also be worth investigating the physical, psychological, and social outcomes of long-term engagement in walking sports and physical activity behaviours for ageing adults.

5.5.4 Translation of Findings into Practice

In Chapter 4, by assessing intentions rather than behaviours, the findings of the mixed-methods study only reveal the *potential* for walking sport programmes to be acceptable and feasible, rather than the *actual* acceptability and feasibility of such programmes in the Australian context. Given the noted intention-behaviour gap (Rhodes & de Bruijn, 2013; Rhodes & Dickau, 2012), future research should consider long-term follow-up to investigate the extent to which intentions translated into behaviour (e.g., initiating walking sport participation). Another interesting line of research could include motivational (i.e., regulatory) and habitual (i.e., automaticity) constructs to better understand the behaviour-intention discordance. As postulated by dual-process models such as the affective-reflective theory of physical inactivity (Brand & Ekkekakis, 2018), these constructs may help explain behavioural enactment.

Although the original intention for this thesis was to implement a pilot walking sport programme, prevailing circumstances made it impractical to do so. Some initial agreements with sport governing bodies fell through and subsequent COVID-19 restrictions that were in place when the data for this thesis was collected, limited the possibility of implementing a comprehensive intervention. These occurrences further highlight some potential pitfalls and the significance of maintaining multiple partnerships in order to successfully implement large-scale interventions (which in practice, as highlighted earlier, can be very challenging). As such, it was not possible to assess ageing adults' physical activity behaviour using devices such as accelerometers, initiation of walking sport participation, and metrics of acceptability, feasibility, and efficacy of walking sport programmes. Therefore, conducting a pilot study would inform a full-scale trial of walking sport programmes, and subsequently, more rigorous trials would support scale up of walking sport programmes in the Australian context.

5.6 Implications and Recommendations for Policy

In countries such as Australia, New Zealand, England, and Canada, the strategic focus of a majority of sporting policies is young age groups and as such there are few policies specifically pertaining to older adults (Dionigi et al., 2021). The findings of this thesis draw attention to some key implications and recommendations for public health policy concerning physical activity promotion. Some key considerations for policymakers and other stakeholders are illustrated below.

5.6.1 Exercise is Medicine (but only for those who can access it)

The Exercise is Medicine initiative advocates that exercise and physical activity can be used as a means to prevent diseases and manage symptoms of chronic conditions, and as such, should be prescribed by healthcare practitioners (Haseler et al., 2019; Jonas & Phillips, 2012; Sallis, 2015). However, there are certain stipulations to be mindful of when prescribing exercise as medicine. Prescription of exercise, for instance, as outlined in the 'ask-assess-advise' framework outlined by Haseler et al. (2019), may inhibit an individual's perceived autonomy and intrinsic motives for physical activity. Exercise prescription relies on the healthcare practitioners' ability to recommend physical activity and communicate with patients in a need-supportive manner while minimising the use of language reflecting ageing stereotypes. Neo-liberal narratives of health promotion fail to consider social and environmental circumstances that may be implicated in physical (in)activity (Gard et al., 2017). However, helping people reap the numerous benefits of exercise cannot rely solely on individual choice. As noted earlier, the present thesis reinforces the heterogeneity in ageing adults and their experiences with physical activity/sport participation as well as the contribution of social, environmental, and policy factors to community-based sport participation. However, simplistic exercise prescription fails to acknowledge this heterogeneity and the social and structural predictors of physical activity (e.g., Bowen et al.,

2019; Williams et al., 2018). Without due consideration, exercise prescription could inadvertently serve to widen health inequalities between privileged and underserved sections of the population where there is already a noted disparity in access to adequate healthcare and physical activity opportunities (Lorenc et al., 2013). Instead, there is a need for policymakers to pay heed to the complexities in the exercise narratives held by individuals belonging to specific socio-demographic, cultural, and ethnic groups, and tailor physical activity initiatives to their specific context. For instance, policymakers may wish to engage the intended end users of physical activity programmes in a consultation process to inform public health policy and decision-making concerning physical activity programmes intended for their consumption. Such assessment would increase the acceptability of (and subsequent interest and engagement in) the proposed physical activity, including walking sport, programme for the intended target population.

5.6.2 Issues Concerning Active Ageing Initiatives

As a policy response to demographic change, active ageing initiatives have emerged which advocate for physical activity as a means for ageing adults to experience better health and well-being outcomes (Evans et al., 2018). However, Evans et al. (2018) argued that, in recent years, perhaps linked with the rise of the Exercise is Medicine movement, sport, exercise, and physical activity promotion has become increasingly medicalised. As such, the boundaries between healthcare, sport, and exercise institutions have become progressively unclear (Evans et al., 2018). For instance, while healthcare professionals may be enlisted with the responsibility of prescribing exercise for patients to achieve beneficial health-related outcomes, setting up and running appropriate physical activity/sport programmes is outside the scope of their role, skills, and expertise. Instead, sport organisations and exercise institutions, who have the skills and expertise, may lack the interest or resources required to deliver such programmes. The responsibility to promote sport and physical activity

programmes lies in the intersection of government, healthcare, and sport organisations, and as such requires the development of partnerships between key stakeholders within these organisations. In a systematic review, Corbin et al. (2018) identified some core components of inter-sector partnerships for health promotion. Corbin et al. (2018) argued that developing a shared vision aligned with each institution's values and goals, ensuring diversity in partners involved, maintaining regular communication, and giving due consideration to political, economic, organisational, and sociocultural contexts are prerequisites for effective and enduring partnerships. A key challenge for these partnerships is that the design and implementation of policies concerning physical activity promotion are reliant on the priorities and perspectives of only few key stakeholders. The findings of this thesis (Chapter 3) highlight the discrepancies between stakeholders' and end-users' perspectives concerning a specific type of community-based sport programme (i.e., walking sports) and the negative effects of centralisation of physical activity initiatives. For instance, when programme aims, implementation strategies, and outcomes are determined by government bodies and national sport organisations, there is less autonomy for local sport organisations, clubs, and facilitators to adapt a programme to suit the needs of their participants.

Another challenge highlighted in Chapter 3 relates to the reliance on sport organisations to drive sport-based physical activity initiatives. The increased commercialisation of sport (e.g., Storm et al., 2017) places sport organisations in a precarious position for determining resource allocation – a conflict arises between prioritising profitable programmes (i.e., youth and elite sport) and community-focused programmes (i.e., older adults and recreational sport) that tend to be less profitable, and sport organisation tend to prioritise the former (Jenkin et al., 2016). In such a commercial landscape, while developing and implementing initiatives to promote physical activity within a specific target group, there is a need to decentralise decision-making and consult with end users of the initiative to better

understand and cater to their specific participation requirements. As suggested by Stathi et al. (2021), community-focused initiatives promoting active ageing would benefit from drawing upon peer volunteers who are more likely to hold altruistic motives and possess greater insight into the needs of the target population. However, in practice, shifting responsibility onto volunteers may be inequitable when their compensation fails to match the importance of their role in delivering successful physical activity/sport programmes. Hence, sport organisations should be mindful of volunteers' contributions and ensure appropriate compensation where possible.

5.7 Implications and Recommendations for Practice

The findings of the present thesis can inform the future development and implementation of community-based physical activity programmes such as walking sports. Specifically, the findings provide insight into the visibility and perception of walking sports among ageing adults, and the various facets of ageism that prevail within a community-based sport setting. Drawing from these findings, recommendations are made to support implementation of community-based walking sport programmes (and physical activity programmes more broadly) in relation to attracting new participants, tackling ageism, identifying suitable programme facilitators, and cultivating an optimal programme environment.

5.7.1 Improved Marketing of Walking Sports

Chapters 3 and 4 highlight the common perception among ageing adults that walking sports, as marketed in their current form, are unappealing. These views were mainly attributed to the name '*walking* sport', which made the sport sound like it was a downgrade from traditional sports. The advertising of such programmes was also criticised as either being virtually absent or sounding geriatric. These views discouraged ageing adults from

wanting to participate in walking sports. However, walking sport players conceded that their negative first impression was not a lasting one – once they managed to attend a session, they found that participation was enjoyable and entailed a higher (yet achievable) level of exertion than they had initially expected. For individuals who had no prior experience with walking sports, reframing the description of the activity to a skill-focused and strategy-based sport, rather than a sport lacking the running element, seemed to promote more favourable perceptions regarding their intent to participate. Taken together, these perspectives suggested that the recruitment material for walking sport programmes was a key barrier that precluded participation of ageing adults who would otherwise be interested in and benefit from participating in such community-based sport programmes. A recent scoping review identified that messaging pertaining to physical activity should be tailored to the intended recipients, framed positively, and emphasise short-term social and mental health benefits of participation (Williamson et al., 2020). Furthermore, messages should incorporate psychological theory – for instance, messages may be formulated to increase recipients' self-efficacy for the activity (Williamson et al., 2020). However, as noted in Chapter 2, sport interventions for middle-aged and older adults failed to incorporate or report the use of psychological theory in their implementation. Hence, organisations and clubs delivering walking sport programmes should, at a minimum, review the recruitment material and advertisements to accentuate the positive elements of a walking sport (e.g., skill-focus), minimise the focus on the negatives (e.g., no running), and foster self-efficacy for the activity. This practice is likely to promote favourable perceptions of walking sports and thereby attract ageing adults to engage in these programmes that are overwhelmingly considered enjoyable and beneficial for physical health and mental well-being.

5.7.2 Tackling Ageism

Chapter 3 illustrates some examples of the different forms of ageism encountered by ageing adults who participate in community-based sports. Institutional ageism seems to systematically disadvantage and restrict ageing adults' access to physical activity and sport opportunities (Massie & Meisner, 2019). The prevalent belief among inactive ageing adults that their participation in physical activity is inappropriate seems to preclude their participation in sport programmes that subsequently leads to fewer sport opportunities being offered, resulting in a vicious cycle. Massie and Meisner (2019) reported that when opportunities did exist, ageing adults recalled several ageist interpersonal interactions (whether intended as positive or negative) that led to further stigmatisation. There were some noted differences (perhaps resulting from individual differences in personality and perceptions of threat or challenge) in how ageing adults dealt with such prevailing stereotypes: some resisted the dominant narrative of decline and challenged ageist stereotypes while others succumbed to the narrative, disengaged from sport, and even internalised the prevailing stereotypes of ageing.

It is important to address these stereotypes from different angles. For institutions, whether government or sport organisations, it may be especially important for key stakeholders to reflect on policies and practices that instigate and sustain ageist beliefs and approaches to physical activity and health promotion. Ensuring equitable access to sport opportunities relies on the initiative of government and sport organisations to strategically focus on, fund, and implement programmes that would support ageing adults' needs. Furthermore, as ageing adults who hold negative views of ageing are generally less active, leading to a self-fulfilling prophecy of poor health and well-being (Wurm & Benyamini, 2014), it may be helpful to change the physical activity messaging around ageing – positively framed anti-ageing messages concerning physical activity have been found to increase ageing

adults' motivation to participate in physical activity (Menkin et al., 2022). Hence, changing this prevailing narrative of age-related decline, and promoting anti-ageing messages relating to physical activity, may empower ageing adults to break down internalised stereotypes. Challenging such stereotypes could encourage ageing adults to engage in physical activity and, ultimately, experience the ensuing physical, psychological, and social benefits.

5.7.3 Attracting New Participants

In Chapters 3 and 4, ageing adults highlighted some key facets of walking sport programmes that were appealing. In order to attract new participants to such community-based sport programmes (and retain existing participants), these facets need to be given due consideration by stakeholders during the implementation and delivery phases of these programmes.

Group membership. In the present thesis, and broadly in the sport literature (e.g., Stenner et al., 2020), one of the primary motives for team sport participation is affiliation or group membership. Especially as adults get older, there are limited opportunities to form new social networks and sport participation provides an avenue to foster new social connections built upon shared interests. For team-based sports (such as walking sports), emphasising the opportunity for social interaction (relative to other physical activities) and supporting the development of social connections would not only attract new participants desiring social interaction, but also foster long-term participation within such programmes (Hirvensalo & Lintunen, 2011; Geller et al., 2018).

Achievability. Another facet that was enjoyable for walking sport participants and attractive to those who had never previously participated in walking sports was the achievability of the activity. Individuals who had participated in walking sports felt that participation involved an optimal level of physical activity, and that walking sports held an advantage in that participants could engage in the sport at their own pace (i.e., they could

walk more and faster or less and slower depending on their physical capability). Such adaptation of sport programmes would provide an optimal and self-selected level of challenge that allows participants to experience autonomy and competency, key facets of intrinsic forms of motivation for physical activity (Teixeira et al., 2012). Physical activity programme facilitators could be trained to deliver sessions in a manner that is optimally challenging for participants, thereby nurturing the experience of psychological need support that would support long-term engagement (Ntoumanis et al., 2017).

For those who had no experience with walking sports, the achievability of the activity strengthened their self-efficacy for physical activity. Drawing attention to the uniqueness of walking sports, that have the potential to cater to a diverse range of physical capabilities could further encourage inactive adults, who may presumably perceive low self-efficacy for physical activity and sport, to participate in these programmes. Drawing upon the achievability of walking sports can also be extended to engage specific clinical populations in physical activity by tailoring the programme to match their fitness level and functional capabilities. Furthermore, programmes targeting clinical populations may also enable individuals to interact with others in their community who may share their diagnosis, thereby strengthening social identity.

Sport identity. As discussed in Chapter 3, for ageing adults who had previously participated in sports, participation in walking sports enabled the retention of a sport identity. Such identity continuity was a major motivating factor for sustained engagement in walking sports. This finding was in alignment with identity theory, which posits that individuals behave in a manner that is consistent with their identity – individuals who held strong exercise identities tended to be more physically active than those holding weak exercise identities (Strachan et al., 2015). Furthermore, exercise identity strength has been associated with self-efficacy, and specifically, self-regulatory efficacy (i.e., the capacity to apply self-

regulatory strategies required to engage in a desired behaviour; Strachan et al., 2015), which, as previously noted, is a key predictor of behaviour maintenance. As noted in Chapter 3, the positive ageing discourse developed through maintaining a sport identity provided walking sport participants with a new lease of life which in turn was associated with better health outcomes including psychological well-being. Therefore, when targeting sport-based physical activity to individuals who have prior sport experience, marketing approaches should appeal to their inner sport identity to encourage their participation.

5.7.4 Identifying Suitable Programme Facilitators

The findings of Chapter 3 illustrated the pivotal role played by facilitators in driving delivery of walking sport programmes and bridging the gap between decision-makers and participants. Decision-makers should regularly seek feedback from facilitators regarding programme delivery and allow facilitators the autonomy to adapt sessions to suit participants' needs. The findings also outline some desirable attributes of facilitators that are likely to be most successful at sustaining enjoyment and engagement of participants in community-based (walking) sport/physical activity programmes (discussed below).

Relatability. Participants and decision-makers felt that it was important for the facilitator to be relatable to the target population. In the case of walking sports, the primary target population was older adults, and as such, it was noted that programmes were particularly successful when facilitators possessed similar attributes as their participants (e.g., age, gender, health status). This finding is in line with the similarity-attraction hypothesis (see Tolman, 2016) which suggests that individuals may hold implicit biases in favour of others possessing similar attributes to themselves. In the context of physical activity programmes, this hypothesis suggests engaging facilitators who share the same values and attributes as participants. The importance of similarity has also been observed in other physical activity contexts for older adults (e.g., Kritz et al., 2020). In previous research, vicarious experience

has been found to have a direct positive association with self-efficacy for exercise and indirect positive association with exercise frequency in older adults (Warner et al., 2011). Therefore, identifying a facilitator who can also act as a champion, ideally someone who has first-hand experience of the benefits of programme participation, and entrusting them with the responsibility for programme delivery may help cultivate other ageing adults' self-efficacy for the activity.

Cultivating a Psychologically Need-Supportive Programme Environment. A key attribute of programme facilitators identified in this thesis, and demonstrated in other physical activity contexts, is the ability to foster psychologically need-supportive environments within the programme setting. Elsewhere, Ntoumanis et al. (2017) identified that when facilitators demonstrated psychologically need-supportive behaviours, programme participants reported higher psychological need-satisfaction and intentions to continue attending group exercise sessions in the long run. Therefore, training programme facilitators to demonstrate psychologically need-supportive behaviours including listening to participants' needs, using inclusive language, acknowledging participants' feeling, and offering options and choice would help participants experience psychological need-satisfaction. In the context of walking sports, need-supportive behaviours may include understanding participants' needs and proactively offering adaptations of the session to suit their differing capabilities. Such a psychologically need-supportive approach to programme delivery could support long-term retention of participants. Through randomised controlled trials, future research could investigate the utility of training programme facilitators to demonstrate need-supportive behaviours as a strategy to support long-term engagement of ageing adults in walking sports and other community-based physical activity programmes.

5.8 Summary and Conclusion

Despite the numerous physical, psychological, and social benefits of physical activity, most older adults are insufficiently physically active (Hallal et al., 2012; Penedo & Dahn, 2005). A lack of community-based sport opportunities has been regarded as a key challenge facing this age group (Jenkin et al., 2016), highlighting the need to identify appropriate, effective, and viable means to deliver sport programmes in a community setting. Past research suggests that walking sports may be a suitable physical activity option for ageing adults who wish to participate in team sports at a lower intensity and participation may have the potential to confer physical, psychological, and social benefits. In several ways, the findings presented in this thesis provide further understanding of the potential of sport to promote physical activity and psychological well-being in middle-aged and older adults. First, the magnitude of the association between sport participation and psychosocial outcomes was synthesised, where it was noted that any form of sport participation (including traditional and adapted forms of sport) yielded identical psychosocial benefits (of modest size). Second, the experiences of multi-stakeholders involved in walking sports illustrated the varied experiences of ageing and stereotypes in the context of community-based walking sports. Third, the differing (and conflicting) perspectives held by different stakeholders and their implications for implementation and delivery of walking sport programmes was noted. Finally, the complexity in individuals' intentions to participate in walking sports and the contextual relevance of a multitude of social-ecological predictors was outlined.

Overall, the findings of this thesis shed new light on the potential of sport (and specifically walking sport) as a means to promote physical activity behaviours and foster psychological well-being in ageing adults, and provide recommendations that can be applied towards generating future research, health promotion policy, and practice. Specifically, the findings from this thesis reinforce the heterogeneity in ageing adults and their experiences

with sport participation and support recent calls to move away from discourses of ageing as a period of decline, and instead recognise the varied experiences of ageing. As such, there is a need to reduce or, at a minimum, refrain from contributing to stereotypes associated with ageing and physical activity. Compatibly, and given the importance of circumstantial factors, there is also a need for community-based physical activity initiatives to move away from neo-liberal narratives of health promotion – rather than solely focusing on addressing individual-level factors, physical activity initiatives should also attempt to modify the other contextual, structural, and policy levels that are implicated in participation.

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Appendices

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Appendix B: Search Strategies

Search Strategy Used for the Medline (Ovid) Database

Search No.	Search Strategy
#1	(psychosocial* or psychology* or psycho-social* or socio-psycholog* or socialpsycholog* or quality of life or wellbeing or well-being or life satisfaction or happiness or mental health or successful ag?ing or depress* or stress* or anxiety*).ti,ab.
#2	healthy aging/ or personal satisfaction/ or quality of life/ or attitude/ or mental health/ or happiness/ or depression/ or anxiety/ or health behavior/ or social behavior/ or "Stress, Psychological"/
#3	1 or 2
#4	((sport adj3 participat*) or (recreation* adj3 sport*) or (communityadj3 sport*) or (leisure adj3 sport*) or (team adj3 sport*)).ti,ab.
#5	(football or soccer or hockey or netball or basketball or tennis or rugby or volleyball or skiing or pickleball or lifeball or floorball or swim*).ti,ab.
#6	sports/ or football/ or soccer/ or hockey/ or basketball/ or tennis/ or racquet sports/ or volleyball/ or skiing/ or swimming/
#7	Sports/px [Psychology]
#8	Psychology, Sports/
#9	(middle-age* or middle age* or aging or ageing or elder* or retire* or senior* or master*).ti,ab.
#10	middle aged/ or aged/ or "aged, 80 and over"/ or aging/
#11	9 or 10
#12	4 or 5 or 6 or 7 or 8
#13	3 and 11 and 12
#14	limit 13 to humans
#15	limit 14 to English

Search Strategy Used for the CINAHL Plus Database

(psychosocial* or psycholog* or psycho-social* or socio-psycholog* or socialpsycholog* or "quality of life" or wellbeing or well-being or "well being" or "life satisfaction" or "mental health" or "successful ag?ing" or depress* or stress* or anxiet* or happiness OR (MH "Stress, Psychological") OR (MH "Psychological Well-Being") OR (MH "Personal Satisfaction") OR (MH "Quality of Life") OR (MH "Mental Health") OR (MH "Mental Processes") OR (MH "Happiness") OR (MH "Pleasure") OR (MH "Depression") OR (MH "Anxiety") OR (MH "Health Behavior") OR (MH "Social Behavior")) AND ((sport* N3 participat*) or (recreation* N3 sport*) or (community N3 sport*) or (leisure N3 sport*) or (team N3 sport*) or football or soccer or hockey or netball or basketball or tennis or rugby or volleyball or skiing or pickleball or lifeball or floorball or swim* OR (MH "Sports/PF") OR (MH "Aquatic Sports/PF") OR (MH "Contact Sports/PF") OR (MH "Endurance Sports/PF") OR (MH "Extreme Sports/PF") OR (MH "Fencing/PF") OR (MH "Golf/PF") OR (MH "Gymnastics/PF") OR (MH "Handball/PF") OR (MH "Professional Sports/PF") OR (MH "Racquet Sports/PF") OR (MH "Skiing/PF") OR (MH "Running/PF") OR (MH "Team Sports/PF") OR (MH "Winter Sports/PF") OR (MH "Triathlon/PF") OR (MH "Track and Field/PF") OR (MH "Swimming/PF") OR (MH "Triathlon/PF") OR (MH "Football/PF") OR (MH "Rugby/PF") OR (MH "Soccer/PF") OR (MH "Hockey/PF") OR (MH "Basketball/PF") OR (MH "Baseball/PF") OR (MH "Softball/PF") OR (MH "Tennis/PF") OR (MH "Volleyball/PF") OR (MH "Psychology, Sports")) AND (middle-age* or middle age* or aging or ageing or elder* or retire* or senior* or master* OR (MH "Middle Age") OR (MH "Aged, 80 and Over") OR (MH "Aged") OR (MH "Frail Elderly") OR (MH "Aged, Hospitalized") OR (MH "Athletes, Master"))

Search Strategy Used for the Cochrane Library Database

psychosocial* OR psycholog* OR psycho-social* OR socio-psycholog* OR socialpsycholog* OR "quality of life" OR wellbeing OR well-being OR "life satisfaction" OR "mental health" OR "successful ag?ing" OR depress* OR stress* OR anxiet* OR happiness
AND
(sport* NEAR/3 participat*) OR (recreation* NEAR/3 sport*) OR (community NEAR/3 sport*) OR (leisure NEAR/3 sport*) OR (team NEAR/3 sport*) OR football OR soccer OR hockey OR netball OR basketball OR tennis OR rugby OR volleyball OR skiing OR pickleball OR lifeball OR floorball OR swim*
AND
middle-age* OR "middle age*" OR aging OR ageing OR elder* OR retire* OR senior* OR master*

Search Strategy Used for the PsycInfo Database

Search No.	Search Strategy
#1	(psychosocial* or psychology* or psycho-social* or socio-psycholog* or socialpsycholog* or quality of life or wellbeing or well-being or life satisfaction or happiness or mental health or successful ag?ing or depress* or stress* or anxiety*).ti,ab.
#2	"life satisfaction"/ or "well being"/ or "quality of life"/ or "coping behavior"/ or "mental health"/ or happiness/ or affect/ or anxiety/ or "psychological distress"/ or pleasure/ or sadness/ or depression/ or "stress, psychological"/ or "health behavior"/ or "social behavior"/
#3	1 or 2
#4	((sport adj3 participat*) or (recreation* adj3 sport*) or (communityadj3 sport*) or (leisure adj3 sport*) or (team adj3 sport*)).ti,ab.
#5	(football or soccer or hockey or netball or basketball or tennis or rugby or volleyball or skiing or pickleball or lifeball or floorball or swim*).ti,ab.
#6	sports/ or football/ or soccer/ or basketball/ or tennis/ or swimming/ or baseball/
#7	Sport psychology/
#8	4 or 5 or 6 or 7
#9	(middle-age* or middle age* or aging or ageing or elder* or retire* or senior* or master*).ti,ab.
#10	"adult development"/ or "psychological aging"/ or aging/
#11	9 or 10
#12	3 and 8 and 11
#13	limit 12 to humans
#14	limit 13 to English

Search Strategy Used for the PubMed Database

(psychosocial*[Title/Abstract] OR psycholog*[Title/Abstract] OR psycho-social*[Title/Abstract] OR socio-psycholog*[Title/Abstract] OR socialpsycholog*[Title/Abstract] OR "quality of life"[Title/Abstract] OR wellbeing[Title/Abstract] OR well-being[Title/Abstract] OR "well being"[Title/Abstract] OR "life satisfaction"[Title/Abstract] OR "mental health"[Title/Abstract] OR "successful aging"[Title/Abstract] OR "successful ageing"[Title/Abstract] OR depress*[Title/Abstract] OR stress*[Title/Abstract] OR anxiet*[Title/Abstract] OR happiness[Title/Abstract] OR "healthy aging"[Mesh] OR "personal satisfaction"[Mesh:NoExp] OR "quality of life"[Mesh:NoExp] OR "attitude"[Mesh:NoExp] OR "mental health"[Mesh:NoExp] OR "happiness"[Mesh:NoExp] OR "depression"[Mesh:NoExp] OR "anxiety"[Mesh:NoExp] or "health behavior"[Mesh:NoExp] or "social behavior"[Mesh:NoExp] or "Stress, Psychological"[Mesh:NoExp]) AND (sport*[Title/Abstract] OR football[Title/Abstract] OR soccer[Title/Abstract] OR hockey[Title/Abstract] OR netball[Title/Abstract] OR basketball[Title/Abstract] OR tennis[Title/Abstract] OR rugby[Title/Abstract] OR volleyball[Title/Abstract] OR skiing[Title/Abstract] OR pickleball[Title/Abstract] OR lifeball[Title/Abstract] OR floorball[Title/Abstract] OR swim*[Title/Abstract] OR "sports"[Mesh:NoExp] OR "football"[Mesh:NoExp] OR "soccer"[Mesh:NoExp] OR "hockey"[Mesh:NoExp] OR "basketball"[Mesh:NoExp] OR "tennis"[Mesh:NoExp] OR "racquet sports"[Mesh:NoExp] OR "volleyball"[Mesh:NoExp] OR "skiing"[Mesh:NoExp] OR "swimming"[Mesh:NoExp] OR "psychology, sports"[Mesh:NoExp] OR "sports/psychology"[Mesh:NoExp]) AND (middle-age*[Title/Abstract] OR "middle age"[Title/Abstract] OR aging[Title/Abstract] OR ageing[Title/Abstract] OR elder*[Title/Abstract] OR retire*[Title/Abstract] OR senior*[Title/Abstract] OR master*[Title/Abstract] OR "middle aged"[Mesh:NoExp] OR "aged"[Mesh:NoExp] OR "aged, 80 and over"[Mesh:NoExp] OR "aging"[Mesh:NoExp]) NOT (mice[Title/Abstract] OR rats[Title/Abstract] OR rodent*[Title/Abstract]) Filters: English

Search Strategy Used for the Scopus Database

TITLE-ABS-KEY(psychosocial* or psycholog* or psycho-social* or socio-psycholog* or socialpsycholog* or "quality of life" or wellbeing or well-being or "well being" or "life satisfaction" or "mental health" or "successful ag?ing" or depress* or stress* or anxiet* or happiness) AND TITLE-ABS-KEY((sport* PRE/3 participat*) or (recreation* PRE/3 sport*) or (community PRE/3 sport*) or (leisure PRE/3 sport*) or (team PRE/3 sport*) or football or soccer or hockey or netball or basketball or tennis or rugby or volleyball or skiing or pickleball or lifeball or floorball or swim*) AND (middle-age* or middle age* or aging or ageing or elder* or retire* or senior* or master*) AND NOT (mice or rats or rodent*) AND (LIMIT-TO (LANGUAGE,"English"))

Search Strategy Used for the SPORTDiscus Database

psychosocial* or psycholog* or psycho-social* or socio-psycholog* or socialpsycholog* or "quality of life" or wellbeing or well-being or "well being" or "life satisfaction" or "mental health" or "successful ag?ing" or depress* or stress* or anxiet* or happiness OR DE "PSYCHOLOGY" OR DE "PSYCHOLOGICAL stress" OR DE "SPORTS teams -- Psychology" OR DE "COGNITION" OR DE "SPORTS psychology" OR DE "EXERCISE & psychology" OR DE "MENTAL depression" OR DE "ANXIETY" OR DE "PSYCHOLOGICAL stress" OR DE "WELL-being" OR DE "QUALITY of life" OR DE "MENTAL health" OR (DE "MOOD (Psychology)" OR DE "ATTITUDE (Psychology)" OR DE "DISTRESS (Psychology)" OR DE "EMOTIONS (Psychology)"

Search Strategy Used for the Web of Science Database

#1 NOT #2 where:
#1: TS=(psychosocial* OR psycholog* OR psycho-social* OR socio-psycholog* OR socialpsycholog* OR "quality of life" OR wellbeing OR well-being OR "well being" OR "life satisfaction" OR "mental health" OR "successful ag?ing" OR depress* OR stress* OR anxiet* OR happiness) AND TS=((sport* NEAR participat*) OR (recreation* NEAR sport*) OR (community NEAR sport*) OR (leisure NEAR sport*) OR (team NEAR sport*) OR football OR soccer OR hockey OR netball OR basketball OR tennis OR rugby OR volleyball OR skiing OR pickleball OR lifeball OR floorball OR swim*) AND TS=(middle-age* OR "middle age*" OR aging OR ageing OR elder* OR retire* OR senior* OR master*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years

#2: TS=(mice or rats or rodent*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC Timespan=All years
Language – English

Search Strategy Used for the ProQuest Dissertations and Theses Database

noft(psychosocial* or psycholog* or psycho-social* or socio-psycholog* or socialpsycholog* or "quality of life" or wellbeing or well-being or "well being" or "life satisfaction" or "mental health" or "successful ag?ing" or depress* or stress* or anxiet* or happiness) AND noft((sport* adj3 participat*) or (recreation* adj3 sport*) or (community adj3 sport*) or (leisure adj3 sport*) or (team adj3 sport*) or football or soccer or hockey or netball or basketball or tennis or rugby or volleyball or skiing or pickleball or lifeball or floorball or swim*) AND noft(middle-age* or “middle age*” or aging or ageing or elder* or retire* or senior* or master*) NOT noft(mice or rats or rodent*)

Search Strategy Used for Google Scholar

(psychosocial|psychological|quality of life|well?being|mental health|successful ag?ing|depression|stress|anxiety|happiness)((participation|leisure|community|team|recreational)sport)(middle-age|ag?ing|elderly|senior|master) -rat -mice -rodent

(psychosocial|psychological|quality of life|well?being|mental health|successful ag?ing|depression|stress|anxiety|happiness)(football|soccer|hockey|netball|basketball|tennis|rugby)(middle-age|ag?ing|elderly|senior|master) -rat -mice -rodent

(psychosocial|psychological|quality of life|well?being|mental health|successful ag?ing|depression|stress|anxiety|happiness)(volleyball|skiing|pickleball|lifeball|floorball|swim)(middle-age|ag?ing|elderly|senior|master) -rat -mice -rodent

Appendix C: Identified Studies with Insufficient Information for Inclusion

Study	Information Missing
Amesberger G, Müller E, Würth S. Alpine Skiing With total knee ArthroPlasty (ASWAP): physical self-concept, pain, and life satisfaction. *Scand J Med Sci Sports* 2015;25:82-89.	M and SD for Physical Self-concept sub-scales and Life Satisfaction for Pre, Post and Retention time-points
Finkenzeller T, Müller E, Würth S, et al. Does a skiing intervention influence the psycho-social characteristics of the elderly? *Scand J Med Sci Sports* 2011;21:69-75.	M and SD for all measured variables (well-being, life satisfaction, physical self-concept, body self-concept, self-rated heath, depression, self-concept, self-efficacy) at all 3 time-points (pre, post and retention)
Jansen P, Dahmen-Zimmer K. Effects of cognitive, motor, and karate training on cognitive functioning and emotional well-being of elderly people. *Front Psychol* 2012;3:40.	M and SD for all measured variables (well-being, life satisfaction, physical self-concept, body self-concept, self-rated heath, depression, self-concept, self-efficacy) at all 3 time-points (pre, post and retention)
Marie-Ludivine C-D, Papouin G, Saint-Val P, et al. Effect of adapted karate training on quality of life and body balance in 50-year-old men. *Open Access J Sports Med* 2010;1:143-50.	M and SD at all 3 time points for physical score (composite), mental score (composite), Physical Functioning, Physical Status, Body Pain, General Health, Vitality, Social Functioning, Emotional Status, Mental Health, Depression
Pedersen MT, Vorup J, Nistrup A, et al. Effect of team sports and resistance training on physical function, quality of life, and	M and SD for team sport group, resistance training group and control groups separately for self-perceived health, physical

motivation in older adults. *Scand J Med Sci Sports* 2017;27(8):852-64.	limitations, psychological health, quality of life subdimensions
Tomioka K, Kurumatani N, Hosoi H. Association between social participation and instrumental activities of daily living among community-dwelling older adults. *J Epidemiol* 2016;26(10):553-61.	Outcome frequencies table: individuals participating in sport and individuals reporting poor instrumental activities of daily living
Tomioka K, Kurumatani N, Saeki K. The differential effects of type and frequency of social participation on IADL declines of older people. *PLoS One* 2018;13(11):e0207426.	Outcome frequencies table: individuals participating in sport and individuals reporting poor instrumental activities of daily living
Tomioka K, Kurumatani N, Saeki K. Cross-Sectional Association Between Types of Leisure Activities and Self-rated Health According to Gender and Work Status Among Older Japanese Adults. *J Epidemiol* 2019;29(11):424-31.	Outcome frequencies table: individuals participating in sport and individuals reporting positive self-rated health

Appendix D: Characteristics of Studies Included

Study (year)	Sport(s)	N	Mean Age	Females (%)	Sport Type	Outcomes	Context	Study Design	Intervention Duration (weeks)	Quality Score (QualSyst summary score)	Effect Size (Hedges' *g*)
Berlin et al. (2018)	Bowling and Golf	143	71.17	100	Individual	Successful Ageing (bowl vs swim; physical)	Recreational	Cross-sectional	N/A	.82	-.64
		119				Health Status (bowl vs swim; physical)					.45
		137				Successful Ageing (bowl vs walk; physical)					-.52
		113				Health Status (bowl vs walk; physical)					.71
						Successful Ageing (golf					-.08

						vs swim; physical)					
						Health Status (golf vs swim; physical)					-.16
						Successful Ageing (golf vs walk; physical)					.09
						Health Status (golf vs walk; physical)					0
Bjerre et al. (2019a)	Football (soccer)	200	68.4	0	Team	Prostate Cancer-Specific Quality of Life (6 months; physical)	Recreational	Experimental	24	.96	.02
						Mental Health Scale (6 months;					-.13

210	positive psychological)		
	Mental Component Summary (6 months; positive psychological)		.24
	Prostate Cancer-Specific Quality of Life (12 weeks; physical)	12	.11
	Mental Health Scale (12 weeks; positive psychological)		.02
	Mental Component Summary (12 weeks;		.13

						positive psychological)					
Bjerre et al. (2019b)	Football (soccer)	197	68.4	0	Team	Prostate Cancer-Specific Quality of Life (physical)	Recreational	Experimental	52	.96	.08
						Mental Health Scale (positive psychological)					.19
						Mental Component Summary (positive psychological)					.19
Ciaccioni et al. (2019)	Judo	30	69.7	50	Individual	Physical Component Summary (physical)	Recreational	Experimental	16	.68	.66
						Mental Component Summary					.26

(positive psychological)	
Body Dissatisfaction (negative psychological)	-.24
Sexual Body Dissatisfaction (negative psychological)	.16
Comparative Body Dissatisfaction (negative psychological)	.41
Body Dissatisfaction Index (negative psychological)	-.13
Body Size Distortion Index	.02

						(negative psychological)					
Dahmen-Zimmer & Jansen (2017)	Karate	28	69.53	19	Individual	Subjective Well-being (positive psychological)	Recreational	Experimental	30	.39	.99
						Depression and Anxiety - Depression subscale (negative psychological)					-.87
						Subjective Health (physical)					1.03
						Self-efficacy (positive psychological)					1.25
						Motor Performance (cognitive)					.91

Dos Santos et al. (2019)	Senior Regional Games	98	65.25	57	Both (team and individual)	Physical Quality of Life (physical)	Competitive	Cross-sectional	N/A	.64	.60
						Psychological Quality of Life (positive psychological)					1.89
						Social Quality of Life (social)					1.67
						General Quality of Life (physical)					2.10
						Sensory Operation (cognitive)					1.49
						Autonomy (positive psychological)					1.51
						Perception of Past, Present, and Future					1.05

						(positive psychological)					
						Social Participation (social)					1.18
						Death/Dying (negative psychological)					-.53
						Intimacy (social)					2.54
Ejiri et al. (2019)	Sport (not specified)	1070	74.12	71	Individual	Social Isolation (social)	Recreational	Cross-sectional	N/A	.82	.53
Geard et al. (2020a)	Masters Sports	1168	57.86	50	Both (team and individual)	Psychological Functioning (positive psychological)	Competitive	Cross-sectional	N/A	.73	.29
						Physical Functioning (physical)					.80

						Social Functioning (social)					.23
						Cognitive Functioning (cognitive)					.16
						Successful Ageing (physical)					.24
Geard et al. (2020b)	Cycling	26	47.05	85	Individual	Physical Functioning - Physical Functioning Dimension (physical)	Competitive	Experimental	12	.82	.29
						Physical Functioning - Role Limitation Physical Problems (physical)					-.83

Psychological Functioning - Mental Health (positive psychological)	.62
Psychological Functioning - Role Limitation Emotional Problems (negative psychological)	-.06
Cognitive Functioning (cognitive)	.20
Social Functioning - Social Activity (social)	1.14
Social Functioning –	-.27

						Loneliness (social)					
						Social Functioning – Friends (social)					.57
Ide et al. (2020)	Sport (not specified)	37429	73.46	54	Both (team and individual)	Functional Decline (physical)	Recreational	Cross-sectional	N/A	.82	.53
Jansen et al. (2017)	Karate	37	63.7	74	Individual	Mood (positive psychological)	Recreational	Experimental	8	.75	.43
						Fatigue (negative psychological)					.10
						Agitation (negative psychological)					-.09
						Anxiety (negative psychological)					.56

Depression (negative psychological)	.39
Optimism (positive psychological)	.16
Pessimism (negative psychological)	.50
SF-12 Physical (physical)	-.16
SF-12 Mental (positive psychological)	.75
Mental Rotation (cognitive)	-.01
Stroop Inhibition (cognitive)	.07

Cognitive Processing Speed (cognitive)	.69
Digit span test - Working Memory (cognitive)	-.02
Work Overload (negative psychological)	-.01
Social Overload (social)	.14
Pressure to Perform (negative psychological)	.13
Work Discontent (negative psychological)	.29

						Excessive Demands at Work (negative psychological)					.21
						Lack of Social Recognition (social)					.28
						Social Tensions (social)					.19
						Social Isolation (social)					.30
						Chronic Worrying (negative psychological)					.22
Kao et al. (2010)	Sport (not specified)	2997	-	-	Both (team and individual)	Perceived Health (35-44; physical)	Recreational	Cross-sectional	N/A	.64	.11

	Happiness (35-44; positive psychological)	.15
2775		
	Perceived Health (45-54; physical)	.03
	Happiness (45-54; positive psychological)	.18
1760		
	Perceived Health (55-64; physical)	.07
	Happiness (55-64; positive psychological)	.13
2402		
	Perceived Health (65+; physical)	.24

						Happiness (65+; positive psychological)					.30
Leung et al. (2020)	Light Volleyball	39	73.72 72.02	53	Team	Enjoyment (positive psychological)	Recreational	Experimental	15	.71	1.15
		40				Enjoyment (positive psychological)					.72
McCracken et al. (2015)	Masters Swimming	74	67.29	-	Individual	Depression (negative psychological)	Competitive	Cross-sectional	N/A	.77	.24
		60				Task Switching - Not Switch Reaction Time (cognitive)					1.30
						Task Switching - Switch Reaction Time (cognitive)					.99

Task Switching - Switch Cost (switch-nonswitch; cognitive)	-.11
Response Compatibility - Incongruent Reaction Time (cognitive)	.43
Response Compatibility - Congruent Reaction Time (cognitive)	.47
Response Compatibility - Response Compatibility (incompatible-compatible; cognitive)	-.22

						Stopping - GO Reaction Time (cognitive)					.08
						Stopping - Stop-Signal Reaction Time (Mean; cognitive)					-.02
						Stopping - Stop-Signal Reaction Time (Interval; cognitive)					-.15
McEwan et al. (2019)	Walking Football (soccer)	16	58.08	0	Team	Mental Well-being (positive psychological)	Recreational	Experimental	8	.71	-.19
						Self-esteem (positive psychological)					-.48
						Social Support via Friendship (social)					-.29

						Loneliness (social)					-.19
						Physical Functioning (physical)					-.23
						Role Limitations due to Physical Health (physical)					.42
Ostlund-Lagerstrom et al. (2015)	Orienteering	360	71.58	33	Individual	Quality of Life - Well-being (EQ-5D; positive psychological)	Competitive	Cross-sectional	N/A	.77	.36
						Self-rated Health (EQ-VAS; physical)					.44
						Psychological Distress					-.15

						(HADS; negative psychological)					
						Health Index (physical)					.44
Shimada et al. (2018)	Golf	100	70.4	47	Individual	Cognitive Functions (cognitive)	Recreational	Experimental	24	.89	.23
						Immediate Word Memory (cognitive)					.04
						Delayed Word Memory (cognitive)					-.01
						Composite Word Memory (Sum of Immediate and Delayed; cognitive)					0.00

Immediate Logical Memory (cognitive)	.39
Delayed Logical Memory (cognitive)	.53
Composite Logical Memory (Sum of Immediate and Delayed; cognitive)	.48
Attention (Trail Making Test-Part A; cognitive)	-.11
Executive Function (Trail Making Test-Part B; cognitive)	.07

						Processing Speed (Digit Symbol Substitution Test; cognitive)					.10
						Depressive Symptoms (Geriatric Depression Scale; negative psychological)					.14
Stone et al. (2018)	Curling	160	75.05	38	Team	Ambulatory Self-Confidence (physical)	Recreational	Cross-sectional	N/A	.86	1.56
						Self-Efficacy for Falls (physical)					1.55
						Activities-Specific Balance					2.02

						Confidence (physical)					.89
						Instrumental Activities of Daily Living (physical)					1.05
						Attitudes Towards Own Ageing (positive psychological)					.32
						Stigma Consciousness (negative psychological)					
Tseng et al. (2014)	Masters Sports	24	73.5	25	Individual	Cognitive Assessment (cognitive)	Competitive	Cross-sectional	N/A	.64	.32
						Adult Reading (cognitive)					1.10
						Letter Fluency (cognitive)					1.60

Category Fluency (cognitive)	1.26
DKEFS Correct Sorts (cognitive)	.41
DKEFS Free Sorting (cognitive)	.30
DKEFS Sort Recognition (cognitive)	.08
DKEFS Composite (cognitive)	.22
DKEFS Contrast (cognitive)	-.31
Trails A (cognitive)	.88

Trails B (cognitive)	.15
Stroop C-W (cognitive)	.59
Verbal Learning (cognitive)	-.12
Simple Reaction Time (cognitive)	.36
2-Choice Reaction Time (cognitive)	-.23
Matching Grids (cognitive)	-.16
Matching Sample (cognitive)	0

						Logical Reasoning (cognitive)					.10
						Memory Search (cognitive)					.12
Tsuji et al. (2018)	Sport (not specified)	74681	73.61	52	Both (team and individual)	Depressive Symptoms (negative psychological)	Recreational	Cross-sectional	N/A	.82	.48
Tsuji et al. (2019)	Sport (not specified)	40308	73.57	51	Both (team and individual)	Cognitive Impairment (cognitive)	Recreational	Cross-sectional	N/A	.82	.36
Wikman et al. (2017)	Floorball	37	69.84	0	Team	Physical Health (SF-12; physical)	Recreational	Experimental	12	.79	.50
						Mental Health (SF-12; negative psychological)					.64

						Anxiety (negative psychological)					.63
						Depression (negative psychological)					.33
Wikman et al. (2018)	Floorball	47	50.47	100	Team	Intrinsic Motivation (positive psychological)	Recreational	Experimental	12	.71	.08
						Extrinsic Motivation - Identified Regulation (positive psychological)					-.10
						Extrinsic Motivation - Introjected Regulation (negative psychological)					.19

						Extrinsic Motivation - External Regulation (negative psychological)					-.09
Witte et al. (2016)	Karate	54	68.41 68.89	57	Individual	Common Cognitive Functioning (cognitive)	Recreational	Experimental	20	.86	.17
						Motor Reactivity (cognitive)					1.75
						Reactive Stress Tolerance (cognitive)					.01
						Divided Attention – Acoustic (cognitive)					-.18
						Divided Attention –					-.33

	Visual (cognitive)	
52	Common Cognitive Functioning (cognitive)	.25
	Motor Reactivity (cognitive)	-.07
	Reactive Stress Tolerance (cognitive)	-.10
	Divided Attention – Acoustic (cognitive)	-.02
	Divided Attention – Visual (cognitive)	-.28

Wurth et al. (2015)	Skiing	19	-	-	Individual	Perceived Pain Severity - Operated Leg (pre vs post; physical)	Recreational	Experimental	12	.50	-.53
						Perceived Pain Severity - Operated Leg (pre vs retention; physical)					-.26
						Perceived Pain Severity - Non-Operated Leg (pre vs post; physical)					-.69
						Perceived Pain Severity - Non-Operated Leg (pre vs retention; physical)					-.27

Appendix E: Risk of Bias (Quality Assessment) Summary Table

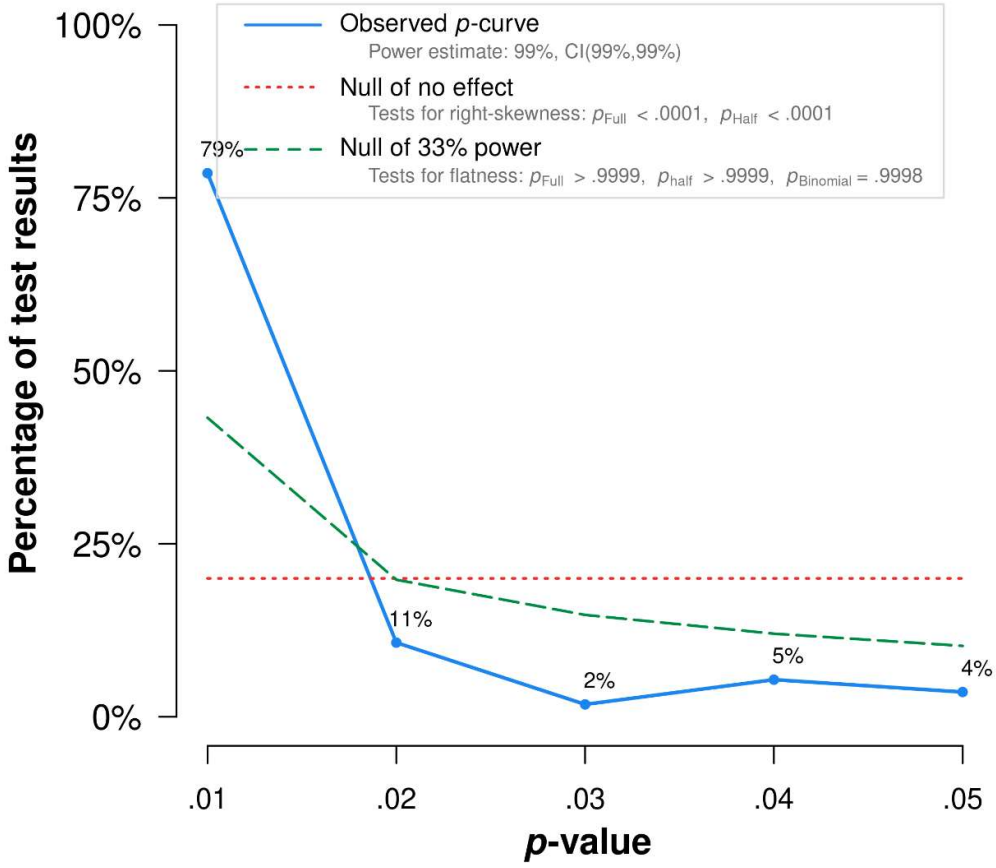
Study (year)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Score	Rating
Berlin et al. (2018)	2	2	1	2				2	1	2	1	1	2	2	.82	S
Bjerre et al. (2019a)	2	2	2	2	2	2	2	1	2	2	2	2	2	2	.96	S
Bjerre et al. (2019b)	2	2	2	2	2	2	2	1	2	2	2	2	2	2	.96	S
Ciaccioni et al. (2019)	2	2	1	2	0	2	0	1	1	2	1	1	2	2	.68	M
Dahmen-Zimmer & Jansen (2017)	2	1	1	1	0	0	0	1	1	2	0	0	1	1	.39	W
Dos Santos et al. (2019	2	1	1	2				2	1	1	0*	0	2	2	.64	M
Ejiri et al. (2019)	2	2	1	2				1	2	2	2	0	2	2	.82	S
Geard et al. (2020a)	1	2	1	2				2	2	2	0	1	1	2	.73	M
Geard et al. (2020b)	2	2	2	2	2	0	0	2	1	2	2	2	2	2	.82	S
Ide et al. (2020)	2	2	1	2				1	2	2	2	0	2	2	.82	S
Jansen et al. (2017)	2	2	2	2	2	0	0	2	1	2	1	2	2	1	.75	M
Kao et al. (2010)	1	2	1	1				1	2	2	1	0	2	1	.64	M
Leung et al. (2010)	2	2	2	2	0			2	2	2	0	2	2	2	.71	M
McCracken et al. (2015)	2	2	2	2				2	1	1	2	0	2	1	.77	M
McEwan et al. (2019)	2	2	2	2	2	0	0	2	0	2	1	1	2	2	.71	M

Ostlund-Lagerstrom et al. (2015)	1	2	2	1				1	2	2	1	1	2	2	.77	M
Shimada et al. (2018)	2	2	2	2	2	2	0	1	2	2	2	2	2	2	.89	S
Stone et al. (2018)	2	1	2	2				2	2	2	1	1	2	2	.86	S
Tseng et al. (2014)	2	1	1	2				1	0	2	1	0	2	2	.64	M
Tsuji et al. (2018)	2	2	1	2				1	2	2	2	0	2	2	.82	S
Tsuji et al. (2019)	2	2	1	2				1	2	2	2	0	2	2	.82	S
Wikman et al. (2017)	2	2	2	2	2	0	0	1	2	2	1	2	2	2	.79	M
Wikman et al. (2018)	2	2	1	2	0			2	1	2	1	0	2	2	.71	M
Witte et al. (2016)	2	2	1	2	2	2	0	2	2	2	1	2	2	2	.86	S
Wurth et al. (2015)	2	2	2	2	0	0	0	1	0	2	1	0	1	1	.50	W

Note. Score is the summary score obtained from the QualSyst tool. Rating is based on the system used by Henry et al. (2016) where S = Strong, M = Moderate, W = Weak.

*not reported in paper, information obtained from author

Appendix F: Visual Depiction of p-curve Analysis



Note: The observed *p*-curve includes 56 statistically significant ($p < .05$) results, of which 50 are $p < .025$. There were 110 additional results entered but excluded from *p*-curve because they were $p > .05$.

Appendix G: GRADE Summary of Findings Table

	Certainty Assessment						Summary of Findings			
Outcome	Number of studies (#ES)	Risk of Bias	Inconsistency	Indirectness	Imprecision	Other Considerations	Sport Participation	Comparator Condition	Effect (95% CI)	Certainty
Psychosocial outcomes (all studies)	25 (166)	Serious[a]	Serious[b]	Not serious	Not serious	Very strong association[c]	43006/166252 (25.9%)	123246/166252 (74.1%)	.330 (.159 to .502)	Low

Note. #ES = Number of Effect Sizes; CI = Confidence Interval.

[a] A majority of the eligible studies had a risk of bias rating pertaining to one or more concerns (see Appendix E).

[b] Substantial heterogeneity among effect sizes ($I^2 = 93.58\%$)

[c] Very large effect sizes observed (see Figures 2 and 3).

Appendix H: Submitted Abstract for Study 2 (Chapter 3)

"More than just a walk in the park": A multi-stakeholder qualitative exploration of community-based walking sport programmes for middle-aged and older adults

Sivaramakrishnan, H., Phoenix, C., Quested, E., Thøgersen-Ntoumani, C., Gucciardi, D., Cheval, B., & Ntoumanis, N.

Abstract

In spite of the large-scale growth of walking sport (WS) programmes globally, limited research has explored the experiences of the key stakeholders involved in such programmes (i.e., decision-makers, facilitators, and players). We aimed to explore stakeholder experiences of community-based WS programmes to better understand the appeal of such sport options for middle-aged and older adults, and propose tentative recommendations for the feasibility and sustainability of these types of programmes. We conducted semi-structured interviews with 21 stakeholders who were involved with WS programmes in Australia as decision-makers, facilitators, and/or players. Data were analysed with reflexive thematic analysis. Four key themes pertaining to the WS experience were identified – 'a renewed lease of life', 'navigating ageing stereotypes', 'tension between organisational demands and players' needs', and 'WS facilitators as catalysts of success'. Specifically, we found that WS participation enabled a positive ageing discourse for middle-aged and older adults. WS players had to negotiate stereotypes that, at times, were perceived as participation barriers. We also noted some tensions between the demands of sport organisations and the needs of middle-aged and older adults regarding sport participation. Finally, we also noted the importance of the facilitators' role in increasing accessibility of, and long-term participation in, such programmes. We suggest that to offer feasible and sustainable community-based WS

programmes across Australia, incompatibilities across various stakeholders' perspectives need to be addressed.

Keywords: Healthy ageing; physical activity; team sport; walking football; ageism

Appendix I: Ethical Approval for Study 2 (Chapter 3)

Curtin University

Research Office at Curtin

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13-Apr-2021

Name: Nikos Ntoumanis
Department/School: School of Psychology
Email: Nikos.Ntoumanis@curtin.edu.au

Dear Nikos Ntoumanis

RE: Amendment approval
Approval number: HRE2020-0742

Thank you for submitting an amendment request to the Human Research Ethics Office for the project **Development of a motivationally embellished community-based Sport for Health (SFH) Walking Sport program for middle-aged and older adults**.

Your amendment request has been reviewed and the review outcome is: **Approved**

The amendment approval number is HRE2020-0742-01 approved on 13-Apr-2021.

The following amendments were approved:

The original protocol comprised of two phases - program development (through conducting interviews) and program delivery (pilot RCT). The key change is that Phase 2 (pilot RCT) will no longer be conducted. Phase 1 of the original proposal (interviews) will be conducted, with some minor changes. These changes are primarily with respect to the target population, interview guides, and anticipated outcomes.

Condition of Approval

Please provide a copy of the the updated recruitment material if you have made any changes to it in relation to the target population and the compensation method.

It is the responsibility of the Chief Investigator to ensure that any activity undertaken under this project adheres to the latest available advice from the Government or the University regarding COVID-19.

Any special conditions noted in the original approval letter still apply.

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.

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

Amy Bowater
Ethics, Team Lead

Appendix J: Interview Topic Guides for Decision-Makers, Facilitators, and Participants

Interview Topic Guide – Decision-Makers

Eligibility Criteria:

Community sport officers within sport organisations and local sports clubs that have offered/are offering walking sport programmes.

Interview Objectives:

- To explore the strengths and limitations of walking sport programmes from the perspective of stakeholders in charge of developing and implementing these within the community
- To identify stakeholders needs and expectations for walking sport programmes
- To understand what is practically possible in terms of the demands of and support provided by the organisation for walking sport programmes
- To understand long-term sustainability of walking sport programmes
- To identify any other factors that need to be considered before developing and implementing a community-based walking sport programme

NOTE: Decision-makers may belong to clubs that either: (1) previously offered and continue to offer walking sport programmes, or (2) previously offered and no longer offer walking sport programmes. The following content will be adapted (omitted or modified) depending on the specific background/role of the individual being interviewed.

Hello, my name is XXXX XXXX, and I am currently doing a PhD in Psychology. Thank you for agreeing to participate in this interview today. We are going to talk about walking sports, and what you believe are some of the strengths, limitations, requirements, and expectations in terms of developing these programmes within the community. The aim of our discussion today is to gain some perspective from people like yourself, who are actively involved in an organisation that offers such programmes. We are hoping to gain your perspective, to help us better understand the demands and challenges involved in implementing such programmes, and how appealing these programmes are to middle-aged and older adults. This interview will help us understand what aspects of the programme make it attractive, which ones less so – and how those might be adapted. The idea of this interview is to allow you to share your views. There are no right or wrong answers. All points of view, both positive and negative, are important. What to say, how to say it, and how much you want to say is up to you. You should not worry about what you are expected to say or whether you are on the right track. You are always welcome to ask me to clarify or elaborate on any of the questions. So that we do not miss any of your comments, I would like to tape record our discussion. I will then type up our conversation so that I have a transcript. Having transcripts of all of the interviews conducted as part of this study will be important for when I begin to collate the main points that the interviewees have made. I have asked your permission to do this. I should point out that, as explained in the information letter, your contribution will be anonymous and kept confidential, and that any published research that might result from such discussions will not contain your name. Our discussion will last for approximately ***30-45 minutes****. Are you still happy to participate? Do you have any questions before we proceed?*

Topic Theme 1: General questions about popularity of walking sport programmes and the demographic drawn

- Can you tell me a little bit about the walking sport programmes that your club/organisation offers?
- How do participants come to hear about walking sport programmes and get involved?
    - **Prompts:** online advertisements / newspapers / flyers
- Can you describe to me what these programmes usually involve?
    - **Prompt:** How much of the programme is skill focused and how much of it is focused on competitions and games?
    - **Prompt:** On average, how many weeks do these programmes run for?
    - **Prompt:** Can you tell me a little more about the demographics of participants signing up to walking sport programmes at your club/organisation?
        - **Prompts:** age groups / skill level / physical activity level / prior experience with sport / socioeconomic status
    - **Prompt:** How much is the fee involved for participants to get involved in walking sport programmes?
    - **Prompt:** What may be some of the options for participants who complete a programme to continue participating in walking sport?
- From your perspective, can you describe how these walking sport programmes have been received by middle-aged and older adults thus far?
    - **Prompt:** Could you give me some examples of the feedback you have received from them about the walking sport programmes?

Topic Theme 2: Demands for the organisation

- What are the typical pathways to becoming a walking sport coach?
    - Prompt: Sport coach or older adult fitness coach?
- Can you describe to me what sort of training is provided to the coaches who deliver these programmes?
    - **Prompt:** Who provides this training to the coaches?
- What kinds of resources does the organisation need to arrange for and contribute towards these walking sport programmes?
    - **Prompts:** equipment / coaches / facilities / funding sources

Topic Theme 3: Programme Expectations

- Could you tell me about the aims of the programme and how these were identified / developed?
    - **Prompt:** Encouraging physical activity in the community / getting people interested in a specific sport
    - **Prompt:** To what extent do you feel that the existing walking sport programmes achieve these aims?
- How would you describe the interest in/demand for walking sport programmes?
    - **Prompt:** What do you think that the future holds for these programmes in terms of participation?
- From your perspective, what – if anything – is needed to ensure these programmes are viable and sustainable in the future?"
    - **Prompt:** How (if at all) is this different to programmes in their current form?

Topic Theme 4: Any Other Considerations

- What other points do you think are important that might need to be considered in relation to developing and setting up a new walking sport program?

Thank you all for your time. Do you have any final comments that you would like to add before we finish up?

Interview Topic Guide – Facilitators

Eligibility Criteria:

Facilitators involved in the implementation and delivery of walking sport programmes

Interview Objectives:

- To explore the strengths and limitations of walking sport programmes from the perspective of coaches involved in delivering such programmes
- To identify the coaches' needs and expectations for the walking sport programmes
- To identify the demands and challenges of walking sport programme delivery from the perspective of coaches
- To understand long-term sustainability of walking sport programmes
- To identify any other factors that need to be considered before developing and implementing a community-based walking sport programme

NOTE: Facilitators may belong to clubs that either: (1) previously offered and continue to offer walking sport programmes, or (2) previously offered and no longer offer walking sport programmes. The following content will be adapted (omitted or modified) depending on the specific background/role of the individual being interviewed.

Hello, my name is XXXX XXXX, and I am currently doing a PhD in Psychology. Thank you for agreeing to participate in this interview today. We are going to talk about walking sports, and what you believe are some of the strengths, limitations, requirements, and expectations in terms of developing these programmes within the community. The aim of our discussion today is to gain some perspective from people like yourself, who are actively involved in coaching such programmes. We are hoping to gain your perspective, to help us better understand the demands and challenges involved in implementing such programmes, and how appealing these programmes are to middle-aged and older adults. This interview will help us understand what aspects of the programme make it attractive, which ones less so – and how those might be adapted. The idea of this interview is to allow you to share your views. There are no right or wrong answers. All points of view, both positive and negative, are important. What to say, how to say it, and how much you want to say is up to you. You should not worry about what you are expected to say or whether you are on the right track. You are always welcome to ask me to clarify or elaborate on any of the questions. So that we do not miss any of your comments, I would like to tape record our discussion. I will then type up our conversation so that I have a transcript. Having transcripts of all of the interviews conducted as part of this study will be important for when I begin to collate the main points that the interviewees have made. I have asked your permission to do this. I should point out that, as explained in the information letter, your contribution will be anonymous and kept confidential, and that any published research that might result from such discussions will not contain your name. Our discussion will last for approximately ***30-45 minutes****. Are you still happy to participate? Do you have any questions before we proceed?*

Topic Theme 1: General questions about the current walking sport programmes

- Can you tell me a little bit about the walking sport programmes that your club/organisation offers?

- Can you tell me more about the demographics of participants signing up to walking sport programmes at your club/organisation?
    - **Prompts:** age groups / skill level / physical activity level / prior experience with sport / socioeconomic status
- From your perspective, how do you think these walking sport programmes have been received by middle-aged and older adults thus far?
    - **Prompt:** Could you give me some examples of the feedback you have received from them about the walking sport programmes?

Topic Theme 2: Demands for the coach

- Can you describe to me what resources are involved in delivering a walking sport program?
    - **Prompts:** equipment / facilities / funding sources
    - **Prompt:** In your opinion, do you think these are provided sufficiently to deliver a successful walking sport program?
- As a coach, can you explain what your responsibilities are for setting up these walking sport programmes?
- What are some of the additional requirements or qualifications, such as first aid training, needed to be able to coach such walking sport programmes?
    - **Prompt:** Do you receive any support to complete this additional training?
    - **Prompt:** If so, who provides it and why?
- Could you talk to me about the time implications of delivering walking sport programmes?

Topic Theme 3: Programme Expectations and changes suggested going forward

- Could you tell me about the aims of the programme and how these were identified / developed?
    - **Prompt:** Encouraging physical activity in the community / getting people interested in a specific sport
    - **Prompt:** To what extent do you feel that the existing walking sport programmes achieve these aims?
- How would you describe the interest in/demand for walking sport programmes?
    - **Prompt:** What do you think that the future holds for these programmes in terms of participation?
- From your perspective, what – if anything – is needed to ensure these programmes are viable and sustainable in the future?"
    - **Prompt:** How (if at all) is this different to programmes in their current form?

Topic Theme 4: Any other considerations

- What other points do you think are important that might need to be considered in relation to developing and setting up a new walking sport program?

Thank you all for your time. Do you have any final comments that you would like to add before we finish up?

Interview Topic Guide –Participants

Eligibility Criteria:

Participants of walking sport programmes aged 35 years and older

Interview Objectives:

- To explore the strengths and limitations of walking sport programmes from the perspective of past programme participants within the age group considered
- To identify what attracts individuals to participate in walking sport programmes
- To understand participation motives and participants' perceived social environment within the walking sport programme
- To understand factors critical for adherence to walking sport programmes
- To understand long-term sustainability of walking sport programmes
- To identify any other factors that need to be considered before developing and implementing a community-based walking sport programme

NOTE: Participants may have either: (1) previously participated and continue to participate in walking sport programmes, or (2) previously participated and no longer participate in walking sport programmes. The following content will be adapted (omitted or modified) depending on the specific background/role of the individual being interviewed.

Hello, my name is XXXX XXXX, and I am currently doing a PhD in Psychology. Thank you for agreeing to participate in this interview today. We are going to talk about walking sports, and what you believe are some of the strengths, limitations, requirements, and expectations in terms of developing these programmes within the community. The aim of our discussion today is to gain some perspective from people like yourself, who have participated in such programmes in the past. We are hoping to gain your perspective, to help us better understand the demands and challenges involved in implementing such programmes, and how appealing these programmes are to middle-aged and older adults. This interview will help us understand what aspects of the programme make it attractive, which ones less so – and how those might be adapted. The idea of this interview is to allow you to share your views. There are no right or wrong answers. All points of view, both positive and negative, are important. What to say, how to say it, and how much you want to say is up to you. You should not worry about what you are expected to say or whether you are on the right track. You are always welcome to ask me to clarify or elaborate on any of the questions. So that we do not miss any of your comments, I would like to tape record our discussion. I will then type up our conversation so that I have a transcript. Having transcripts of all of the interviews conducted as part of this study will be important for when I begin to collate the main points that the interviewees have made. I have asked your permission to do this. I should point out that, as explained in the information letter, your contribution will be anonymous and kept confidential, and that any published research that might result from such discussions will not contain your name. Our discussion will last for approximately ***30-45 minutes****. Are you still happy to participate? Do you have any questions before we proceed?*

Topic Theme 1: General questions about the past walking sport programmes and participants' experiences

- We are going to discuss a little bit about physical activity. By this I mean any sort of bodily movement that increases your energy expenditure above your baseline level. This may include playing sports, going to the gym, or even gardening and housework. Can you describe your past experience with physical activity?
    - **Prompt:** What sort of physical activities do you perform in a typical week?
    - **Prompt:** How do these activities make you feel? (Are they enjoyable, are they tasks that need to get done, or do you dislike them?)
    - **Prompt:** Did you have any experience playing sport prior to the walking sport program?
    - **Prompt:** So that was the past, now thinking about the present, to what extent would you identify with the label of being "a physically active person"?
- How did you first come to hear about walking sport programmes and why did you get involved?
    - **Prompts:** online advertisements / newspapers / flyers
- Can you describe to me what each session of these programmes usually involves?
    - **Prompt:** What are some of the key features of a walking sport program?
        - Skill focus / competitions and games / socialising
    - **Prompt:** On average, how many weeks do these programmes run for?
    - **Prompt:** Can you tell me a little more about the people who participated in walking sport with you?
        - **Prompts:** number of participants / age groups / skill level / physical activity level / prior experience with sport
    - **Prompt:** How much is the fee involved for participants to get involved in walking sport programmes?
- In your opinion, to what extent do you think this walking sport programme is suitable for people of different skill levels?

Topic Theme 2: Participation Motives and Environmental Factors

- Can you explain to me what attracted you to start participating in walking sport?
    - **Prompt:** What aspects of walking sport did you like?
    - **Prompt:** What aspects did you not like about walking sport?
- Can you describe to me your relationship with the others who participated in walking sport with you?
- Can you describe to me your relationship with the coach?
    - **Prompt:** How would you describe the communication with them and the feedback you receive(d)?
    - **Prompt:** To what extend would you say the coach(es) show(ed) a personal interest in you?
    - **Prompt:** To what extend would you say these interactions were supportive?

Topic Theme 3: Long-term maintenance

- Can you tell me about your involvement in walking sport? For example, where you found out about it, why you joined, how long you did it for, etc.
    - **Probe:** How long did you participate in the walking sport program?
    - **Probe:** Do you still continue to participate? Why/why not?
    - **Probe:** For you personally, what motivated you to participate in walking sport programmes?
        - **Probes:** being active / socialising / learning new skills

- Can you tell me any other forms of physical activity you engage in besides walking sport?
    - **Probe:** How would you compare your experience participating in walking sport with the other activities? (depending on response to above)
- From memory, can you recall any aspects of walking sport programmes that made or could make it difficult for you to participate in these?
    - **Probe:** intimidating / other commitments / injury / costs
- How did you start to feel after you'd been participating in walking sport for a few weeks?
    - **Probe:** Can you describe the sort of benefits that you found participating in walking sport provided you with?
    - **Probe:** Can you describe some of the drawbacks of participating in walking sport?

Topic Theme 4: Future Considerations

- Would you consider participating in a future walking sport program? If so, why? (/why not?)
    - **Probe:** To what extent would you recommend walking sport to others?
- How important would it be for you to participate with only people closer to your own age (e.g., only older adults), as opposed to a wide age range of people (i.e., anyone who is interested in playing)?
- How important would it be to you to participate in a walking sport programme with only people of your own gender, rather than a mixed gender group?
- Thinking about value for money, how much would you be willing to pay per session to participate in a walking sport program?
- How far would you be willing and / or able to travel to take part in a walking sport programmes?
- What time of day or day of the week is most convenient for you to participate in these walking sport programmes?
- For how long would you want each session of a walking sport programme to be conducted?
- What would your ideal session involve? To what extent would you want to focus on skill development or play social games?
- What aspects specifically do you think can be changed about the walking sport programme to make it better and more attractive in the future?

Topic Theme 5: Any other considerations

- What other points do you think are important that might need to be considered in relation to developing and setting up a new walking sport program?

Thank you all for your time. Do you have any final comments that you would like to add before we finish up?

Appendix K: Submitted Abstract for Study 3 (Chapter 4)

Predictors of middle-aged and older adults' intentions to participate in walking sport programmes: A social-ecological mixed methods approach.

Sivaramakrishnan, H., Quested, E., Cheval, B., Thøgersen-Ntoumani, C., Gucciardi, D., & Ntoumanis, N.

Abstract

There is a growing need to identify acceptable and feasible opportunities to engage adults in physical activity. Walking sports may be a potential means to engage adults in sport; however, there is limited evidence regarding appeal and feasibility to support its implementation and delivery. Using a two-step mixed-methods approach, we aimed to (1) to quantitively identify significant predictors of middle-aged and older adults' intentions to participate in walking sports and (2) to understand why and how these identified predictors may be contextually relevant to the target group. In phase one, 282 middle-aged and older adults without prior experience of walking sports completed an online questionnaire assessing personal, psychosocial, programme-related, and environmental predictors, and intentions to participate in walking sports. Hierarchical multiple linear regressions showed that perceived health status, attitudes, subjective norms, and distance of venue were significant predictors of intentions. In phase two, interviews with a subset of 17 participants indicated that, when implementing walking sport programmes, programme labelling, fear of the unknown, and individual differences in the appeal of walking sport warrant consideration. Policymakers may wish to consider these findings to promote physical activity and health in aging adults.

Keywords: Aging; healthy aging; physical activity; team sport; walking football

Appendix L: Ethical Approval for Study 3 (Chapter 4)

Curtin University

Research Office at Curtin

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Perth Western Australia 6845

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

22-Jun-2021

Name: Eleanor Quested
Department/School: Curtin University
Email: Eleanor.Quested@curtin.edu.au

Dear Eleanor Quested

RE: Ethics Office approval
Approval number: HRE2021-0360

Thank you for submitting your application to the Human Research Ethics Office for the project **The potential appeal of community-based walking sport programs for middle-aged and older adults**.

Your application was reviewed through the Curtin University Low risk review process.

The review outcome is: **Approved**.

Your proposal meets the requirements described in the 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 **22-Jun-2021** to **21-Jun-2022**. 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
Sivaramakrishnan, Hamsini	Student
Quested, Eleanor	CI
Ntoumanis, Nikos	Co-Inv
Gucciardi, Daniel	Co-Inv
Thogersen-Ntoumani, Cecilie	Co-Inv

Approved documents:

Document

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. 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

It is the responsibility of the Chief Investigator to ensure that any activity undertaken under this project adheres to the latest available advice from the Government or the University regarding COVID-19.

This letter constitutes low risk/negligible risk 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

Amy Bowater
Ethics, Team Lead

Appendix M: Recruitment Material for Study 3 (Chapter 4)

Curtin University

Are you aged 35 years or older?

Never played (or heard of) walking sports before?

If so, we would love to hear from YOU!

Complete a short survey (less than 20 minutes) and stand a 1 in 6 chance to win a $50 Coles/Myer gift card!

We want to make sure that your views are considered when setting up community-based walking sport programs in the future

If you would like to learn more about the research, contact:
hamsini.sivarama@postgrad.curtin.edu.au

Curtin University Human Research Ethics Committee (HREC) has approved this study (HRE2021-0360).

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Appendix N: Questionnaire Used in Phase One

Questionnaire

Section 1 – Please answer the following questions about yourself
Gender:
☐ Female
☐ Male
☐ Transgender female
☐ Transgender male
☐ Gender variant or non-conforming
☐ Prefer not to say
☐ Not listed above: _____

Date of Birth: _____

Highest educational qualification obtained:
☐ Postgraduate degree level
☐ Graduate diploma and graduate certificate level
☐ Bachelor degree level
☐ Advanced diploma and diploma level
☐ Certificate level
☐ Secondary education
☐ Primary education
☐ Pre-primary education
☐ Other education, please specify _____

Postcode: _____

Employment status:
☐ Employed full-time
☐ Employed part-time
☐ Casual employee
☐ Unemployed
☐ Retired

Marital status:
☐ Single
☐ De facto relationship
☐ Married
☐ Divorced
☐ Widowed

Average household annual income (before deductions):
☐ Nil income
☐ $1 - $10,399
☐ $10,400 - $15,599
☐ $15,600 - $20,799
☐ $20,800 - $31,199
☐ $31,200 - $41,599

☐ $41,600 - $51,999
☐ $52,000 - $64,999
☐ $65,000 - $77,999
☐ $78,000 - $103,999
☐ $104,000 or more

Ethnicity:

☐ Caucasian

☐ Aboriginal

☐ Torres Strait Islander or Pacific Islander

☐ African

☐ Asian

☐ Mixed

☐ Other, please specify: _____

Past sport experience:
In your adult life (since the age of 18), have you participated in any sport previously (for a minimum of 6 months)?
☐ Yes
☐ No

If yes, what sport(s) did you participate in? _____
For each of the sports listed, approximately how many years did you participate?
_____

In general, would you say your health is:
☐ Excellent
☐ Very Good
☐ Good
☐ Fair
☐ Poor

Section 2 – Physical Activity
We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.
Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ days per week
☐ No vigorous physical activities → **Skip to question 3**

2. How much time did you usually spend doing vigorous physical activities on one of those days?

_____ hours per day
_____ minutes per day
☐ Don't know/Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ days per week
☐ No moderate physical activities → **Skip to question 5**

4. How much time did you usually spend doing moderate physical activities on one of those days?

_____ hours per day
_____ minutes per day
☐ Don't know/Not sure

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

_____ days per week
☐ No walking → **Skip to question 7**

6. How much time did you usually spend walking on one of those days?

_____ hours per day
_____ minutes per day
☐ Don't know/Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the last 7 days, how much time did you spend sitting on a week day?

_____ hours per day
_____ minutes per day
☐ Don't know/Not sure

Section 3 – Your Surroundings, Neighbourhood, and Environment:

The following questions are related to how you view your surroundings, neighbourhood, and the environment. Please indicate to what extent you agree or disagree with each of the statements below.

	Item	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't know/Not sure
1.	My neighbourhood has several free or low-cost recreation facilities, such as parks, walking trails, bike paths, recreation centres, playgrounds, public swimming pools, etc.					
2.	The crime rate in my neighbourhood makes it unsafe to go on walks at night.					
3.	The crime rate in my neighbourhood makes it unsafe to go on walks during the day.					
4.	There is so much traffic on the streets that it makes it difficult or unpleasant to walk in my neighbourhood.					
5.	There is so much traffic on the streets that it makes it difficult or unpleasant to ride a bicycle in my neighbourhood.					
6.	I see many people being physically active in my neighbourhood doing things like walking, jogging, cycling, or playing sports and active games.					

Section 4 – Walking Sports

Walking sports are based upon the principles of popular sports, such as football (soccer), netball, hockey, etc. These sports follow the standard rules of the game, but players walk instead of running. The focus is on positioning, control, and motor skills involved in team-based sports. Walking sports provide a semi-formal, recreational option to play sport, develop new skills or refine existing skills, and remain physically active while also reducing the risk of injury due to lower physical exertion. It also reduces the influence of diverse fitness levels of participants – the rules are suitably adapted to focus on the tactical and social aspects of the game, and encourage individuals to remain physically active. Walking sports are usually conducted in local community sport facilities, and tend to be open to people of all ages and abilities, from beginners to those who have years of experience in a sport. Often, both, middle-aged and older adults tend to participate in walking sports. These opportunities are well-suited for people who want the fun of the game, without the strenuous pace and physical demands of most typical sports.

visit playwalkingnetball.com.au, playfootball.com.au/player/walking-football, and hockeywa.org.au/participate/walkinghockey/ for more information on some specific sports. Alternatively, have a look at some of the following short videos that provide a basic overview of what specific walking sports look like: https://www.youtube.com/watch?v=rtTJe1_yajA

https://www.youtube.com/watch?v=VkGiINFFJ3A
https://www.youtube.com/watch?v=HY336q0S2-k
https://www.youtube.com/watch?v=qzQfnv7sFPg

The following questions are about your perception of walking sports, assuming a walking sport programme was made available to me in the near future. Please move the sliding scale for each item to indicate your opinions on participation in walking sports.
If a walking sport programme is made available to me in the near future, participating in walking sport would be…

		-3	-2	-1	0	+1	+2	+3	
1.	Boring								Fun/interesting
2.	Bad								Good
3.	Useless								Useful
4.	Harmful								Beneficial
5.	Foolish								Wise
6.	Unenjoyable								Enjoyable
7.	Unpleasant								Pleasant
8.	Stressful								Relaxing

The following questions focus on the people closest to you. Assuming a walking sport programme was made available to me in the near future, please select the option most applicable to you, please respond to each statement indicating to what extent you agree or disagree.
If a walking sport programme is made available to me in the near future…

	Item	**Strongly Disagree**			**Neutral**			**Strongly Agree**
1.	My family would want me to participate in walking sport	1	2	3	4	5	6	7
2.	My friends would want me to participate in walking sport	1	2	3	4	5	6	7
3.	My family would participate in walking sport	1	2	3	4	5	6	7
4.	My friends would participate in walking sport	1	2	3	4	5	6	7

The following statements focus on your ability to engage with walking sport, assuming a walking sport programme was made available to me in the near future. Please indicate to what extent you agree or disagree with each statement.
If a walking sport programme is made available to me in the near future…

	Item	Strongly Disagree			Neutral			Strongly Agree
1.	I am confident that I could participate in walking sport if I really wanted to	1	2	3	4	5	6	7
2.	I have the time to participate in walking sport if I wanted to	1	2	3	4	5	6	7
3.	It is completely up to me whether or not I choose to participate in walking sport	1	2	3	4	5	6	7

	Item	Very Difficult			Neither Difficult Nor Easy			Very Easy
4.	Participating in walking sport would be ____ for me	1	2	3	4	5	6	7

The following questions focus on the support you receive from those around you. Please rate how supported you would feel by those around you if you were to participate in walking sport.
If needed, I would have someone who…

	Item	Never True			Sometimes True			Always True
1.	Could provide reassurance.	1	2	3	4	5	6	7
2.	Could provide me with positive feedback.	1	2	3	4	5	6	7
3.	Would understand my problems/worries.	1	2	3	4	5	6	7
4.	I can relate to.	1	2	3	4	5	6	7

5.	Could provide help traveling to the programme if needed.	1	2	3	4	5	6	7
6.	Could loan or give me something to help participate in walking sport (e.g., sports kit, equipment).	1	2	3	4	5	6	7
7.	Would care for my dependents or pets if needed.	1	2	3	4	5	6	7
8.	Could help at short notice.	1	2	3	4	5	6	7

The following questions are about your intentions to participate in walking sport, assuming a walking sport programme was made available to me in the near future. Please select the option most applicable to you.
If a walking sport programme is made available to me in the near future…

	Item	**Strongly Disagree**			**Neutral**			**Strongly Agree**
1.	My intention would be to participate	1	2	3	4	5	6	7
2.	I would plan to sign up	1	2	3	4	5	6	7
3.	I would still choose to do something else	1	2	3	4	5	6	7

Please indicate the extent to which the following features of a walking sport programme would make you more (or less) likely to participate in such a programme. Select the middle option (0) if the feature is unlikely to influence your decision to participate.

		Unlikely to participate			**Does not make a difference**			**Very likely to participate**
1.	Organised/coached program	-3	-2	-1	0	+1	+2	+3
2.	Non-coached turn up and play activity	-3	-2	-1	0	+1	+2	+3
3.	Recreational/social (e.g., no competitions)	-3	-2	-1	0	+1	+2	+3

4.	Competition-focused (e.g., within leagues playing other teams)	-3	-2	-1	0	+1	+2	+3
5.	Participants of similar age to you	-3	-2	-1	0	+1	+2	+3
6.	Large group sessions (as opposed to small groups)	-3	-2	-1	0	+1	+2	+3
7.	Mixed gender participation (as opposed to only participants of your own gender)	-3	-2	-1	0	+1	+2	+3
8.	Weekday evening sessions	-3	-2	-1	0	+1	+2	+3
9.	Weekend sessions	-3	-2	-1	0	+1	+2	+3

Use the sliding scale to indicate:

1. The maximum cost you would be willing to pay to participate in walking sport (per session)

   $0 $50

2. The maximum distance from home you would be willing to travel to participate in walking sport

   0 km 50 km

Appendix O: Interview Topic Guide Used in Phase Two

Interview Topic Guide

Topic Theme 1: General questions about participants' experiences with sport participation

One of the things we will talk about today is physical activity, and specifically focusing on playing sport. By physical activity, we mean any activity that raises your heart rate and breathing rate, and may cause you to become a little sweaty.

- Can you describe your current or past involvement with any sort of physical activity?
    - **Probe:** What sort of activities do you participate in?
    - **Probe:** Can you tell me a little more about your experience with these activities?
- Can you think of a time in your life when you participated in sport?
    - **Probe:** Can you tell me a little more about your experience with participating in sport?
    - **Probe:** Which sports? / how old were you? / organised or unorganised? / professional or social?
- Outside of this, how much free time do you have for any other physical activities or sports?

Topic Theme 2: Appeal of walking sport

Walking sports are based upon the principles of popular sports, such as football (soccer), netball, hockey, etc. These sports follow the standard rules of the game, but players walk instead of running. The focus is on positioning, control, and motor skills involved in team-based sports. Walking sports give people a semi-formal, recreational option to play sport, develop new skills or refine existing skills, and remain physically active but also requires lower physical effort, and so it reduces the risk of injury. Since the rules are adapted and focus on social aspects of the game, it is suitable for people of all fitness levels. Walking sport programmes can usually be found in local community sport facilities, and tend to be open to people of all ages and abilities, from beginners to those who have years of experience in a sport. Walking sports are great for people who want the fun of the game, without the strenuous pace and physical demands of most typical sports.

- Prior to completing the online survey, how familiar were you with walking sport programmes?
    - **Probe:** If so, how did you hear about walking sports?
- What is your impression of walking sports? Would you describe your views on walking sports as 'positive' or 'negative'? Why?
    - **Probe:** How do you think this impression might influence your likelihood of participating in walking sports?

- To what extent do you feel like walking sports might appeal to a specific type of person? How would you describe this person?
    - Probe: gender / age / sport history
- Can you explain what aspects of a walking sport might appeal to you? Why?
- What about walking sport might make it less appealing to you? Why?
- How can walking sport programmes be made more attractive for people like yourself?
    - **Probe:** coaching / competition / flexible turn-up and play / age group / group size / session time
    - **Probe:** Which sports would you be interested in participating in? Why?
- Assuming that a walking sport programme was easily accessible to you, how appealing is walking sport when compared with other forms of physical activity that you already do?
    - **If applicable:** Given that you mention not having a lot of free time, to what extent do you think you might wish to replace all or some of your existing physical activities with walking sports?
- For you personally, what might motivate you to participate in walking sport programmes? Why are these important to you?
    - **Probes:** being active / socialising / learning new skills
- What about the nature of walking sports might make it difficult for you to participate? Why?
    - **Probe:** intensity of the activity / having necessary equipment / knowledge of sport and rules / general health and fitness / knowing others participating in the sport

Topic Theme 3: Relevant constructs
In our research, we wanted to explore whether people's personal circumstances, perceptions of walking sport and surroundings influence people's intentions to participate in walking sport programmes. I would now like to ask you some questions to understand how these factors may be important to you.

- How do you think some aspects of your personal circumstances might affect your ability to participate in walking sports? Why?
    - How do you think your age might affect your ability to participate in walking sports?
    - How do you think your gender might affect your ability to participate in walking sports?
    - How do you think your income level might affect your ability to participate in walking sports?

  - How do you think your work schedule might affect your ability to participate in walking sports?
  - How do you think the modes of transport available to you might affect your ability to participate in walking sports?
  - **Probe:** How can these barriers be overcome?
- How has your health had an impact on your ability to participate in physical activities?
- How active would you rate the people in your surroundings to be?
- From your perspective, how would your friends and family's opinions on walking sports influence whether you choose to participate?
  - **Probe:** How can this barrier be overcome?
  - **Probe:** What are some of the ways you would like to be supported by those around you if you wished to participate in walking sport programmes?
- Can you tell me a little more about how some aspects of your surroundings might affect your intentions to participate in walking sports? Why?
  - How do you think crime and safety of your neighbourhood might affect your ability to participate in walking sports?
  - How do you think traffic in your neighbourhood might affect your ability to participate in walking sports?
  - How do you think access to facilities in your neighbourhood might affect your ability to participate in walking sports?
  - **Probe:** How can organisers of these programmes help overcome these barriers?
- To what extent is having a friendly and welcoming group of people particularly important for you? Why?
- In your opinion, how do you think walking sport programmes can be made accessible to people?
  - **Probe**: Location
- How do you think walking sport programmes can be made affordable for you?

Topic Theme 4: How to make walking sport programmes attractive – practical considerations and suggestions for future programmes

- How do you think walking sport programmes could be advertised to appeal to people similar to you?
  - **Probes:** online advertisements / newspapers / flyers

- What are some other things that might influence whether you participate in a walking sport? Why?

Topic Theme 5: Any other considerations

- What other points might we need to consider that may be relevant to developing and setting up a new walking sport program?

(End of interview)