

Physical activity and nutrition program for seniors (PANS): Process evaluation

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Abstract

Issue addressed: The Physical Activity and Nutrition Program for Seniors (PANS)

program aimed to increase levels of physical activity and improve the diet of insufficiently active community based seniors aged 60-70 using a range of strategies. Comprehensive process evaluation was used to determine the suitability and appropriateness of the resources and effectiveness of the strategies.

Method: Process evaluation data (qualitative and quantitative) were collected on the program strategies and resources throughout, and at the conclusion of the intervention period.

Results: The program strategies/ resources were found to be relevant to the population, assisting participants to increase their level of physical activity and improve their diet. Participants reported that the program resources were suitable for their age group (84%); encouraged them to think about physical activity (78%); and nutrition (70%). Participants reported that they used the pedometer (91%) and recorded daily steps (78%). Moreover, the provision of group Guides facilitated individuals to set and achieve personal goals.

Conclusion: The PANS strategies and resources were appropriate, which supported the seniors in identifying, establishing, and achieving their physical activity and nutrition goals. Minor refinements of the program were recommended based on the findings.

Physical activity and nutrition program for seniors (PANS): Process evaluation

INTRODUCTION

Physical activity declines as people age (Thogersen-Ntoumani, Loughren, Duda, Fox, & Kinnafick, 2010). In the USA, only 39% of the population aged 65 and above achieved recommended physical activity levels in 2007 (Centers for Disease Control and Prevention, 2007). In Australia, 51% of older adults aged 60 to 75 years do not meet the national

physical activity guidelines while 33% are completely sedentary (Australian Bureau of Statistics, 2009). Physical inactivity is now recognised as the fourth largest preventable cause of diseases behind hypertension, overweight/obesity and smoking (Danaei et al., 2009).

Along with reduced levels of physical activity (Australian Bureau of Statistics, 2009; United States Department of Health and Human Services, 2008), there has been an increase in the consumption of energy dense foods high in saturated fat and sugar worldwide (World Health Organization, 2012). Indeed, energy and fat intake have increased in both USA (Chanmugam et al., 2003) and Australia (Flood et al., 2010) within the past few decades. Such changes in dietary patterns have detrimental effects on body weight; 79% of older Australians are now classified as overweight or obese (Australian Bureau of Statistics, 2009). This is of great concern in view of the strong association between excess body weight, chronic health problems and health care costs (Popkin, 2006; Sassi, Cecchini, & Devaux, 2010). In developed countries, obesity contributes 0.7 to 2.8% of total yearly health expenditure (Withrow & Alter, 2010), emphasising the need for interventions that can improve both physical activity and nutrition, especially for people aged 60 to 70 years (Prochaska, Nigg, Spring, Velicer, & Prochaska, 2008).

Process evaluation of physical activity and nutrition programs is necessary to confirm if the prescribed intervention is appropriate for the priority population (Green & Kreuter, 2005) and implemented according to plan (Burke et al., 2008; Griffin et al., 2010; Jancey et al., 2008). It provides insight into the internal operations of the program. Without process evaluation, the fit of the program, its delivery and context cannot be determined (Nutbeam & Bauman, 2006). Process evaluation is essential to determine the reach and

acceptability of the varied strategies implemented in an intervention, which includes mailed information, emails, phone calls and group meetings (Oakley et al., 2006).

Process evaluations of RCTs aimed at older adults are required to address the increasing demand to develop more public health interventions for the target group (Clark et al., 2011). Many RCT's reported in the literature do not explicitly describe their process evaluation (Oakley, et al., 2006). This intervention research program provides comprehensive information on the intervention components by collecting both qualitative and quantitative data via a range of instruments, such as brief questionnaires and exit interviews (Oakley, et al., 2006). This paper discusses the process evaluation of the Physical Activity and Nutrition Program for Seniors (PANS). It presents information on the acceptability and effectiveness of strategies, the appropriateness of PANS resources and factors that may have affected usage of program materials.

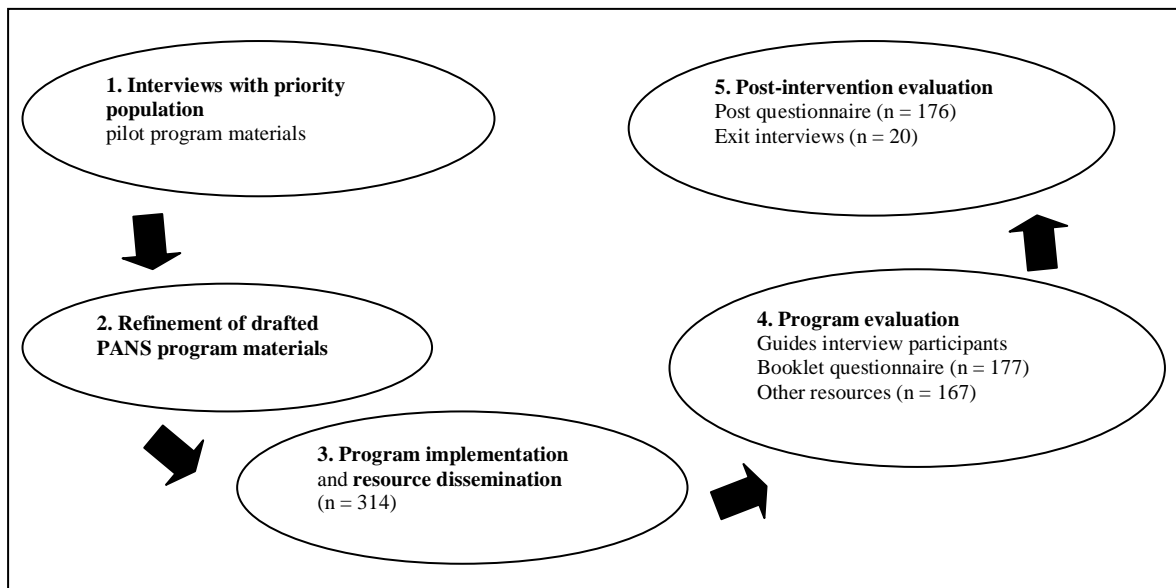
METHODS

The intervention

PANS was a 6-month physical activity and dietary intervention conducted in metropolitan Perth, Western Australia. It aimed to improve physical activity and nutrition behaviours using a home-based program, with materials specifically developed for insufficiently active older adults aged 60 to 70 years. The intervention and evaluation design were based on a pilot study that produced encouraging results with respect to adherence and behaviour change (Burke, et al., 2008). The project protocol was approved by Curtin University Human Research Ethics Committee (approval number HR 186/2008).

The process undertaken to develop, implement and evaluate PANS is summarised in Figure 1. Step 1 consisted of interviews with people from the priority population to determine their views on the appropriateness of pilot program materials (Burke, et al., 2008). Step 2 involved the refinement of drafted materials based on the feedback, review of pertinent literature on physical activity and nutrition programs (Morey et al., 2009; Sherwood et al., 2008), along with input from the experienced research team. Step 3 represented program implementation, whereby seniors who met the inclusion criteria and agreed to take part were provided with the PANS resources. Steps 4 and 5 outlined the different aspects of evaluation via feedback provided by Group Guides, questionnaires and exit interviews with the participants.

Figure 1. Development and process evaluation of the PANS program



This study was based on the Social Cognitive Theory (SCT) (Bandura, 1986; Glanz, Rimer, & Viswanath, 2008), The Health Belief Model (HBM) (Glanz, et al., 2008), and the Precede-Proceed Model (Green & Kreuter, 2005), incorporating voluntary cooperation and self-efficacy (Bandura, 1997) in planning the intervention. The SCT's central construct of

self-efficacy was included to increase the likelihood of improving participants' confidence in carrying out suggested health behaviours. The program content was developed using the four information sources (Bandura, 1997; Glanz, et al., 2008): a) performance accomplishments – participants were encouraged to set short and long term goals; b) vicarious experience - examples and capability of others were demonstrated in the written materials and this was also provided through discussions and activities at non-compulsory group meetings; c) verbal encouragement - from the Guides, face-to-face conversations, phone calls and emails; and d) perceived physiological and affective responses - provided through written materials, the Guides and activities that included prompts and information.

The PANS intervention contained a range of strategies and resources. The main component was a program booklet designed to motivate and encourage participants to increase their level of physical activity and improve their diet through individual goal setting. It provided physical activity and dietary advice in line with the Australian physical activity guidelines (Brown, Moorhead, & Marshall, 2008) and the Australian dietary guidelines for older adults (Department of Health and Ageing, 1998; National Health and Medical Research Council, 1999). Additional written materials included an exercise chart, a calendar that reinforced key messages in the PANS booklet. The participants were also supplied with a resistance band to perform the strength exercises described in the home-based program, together with a pedometer to encourage walking and recording of daily steps.

The provision of trained Guides (Jancey, et al., 2008; Lee et al., 2011) was another feature of PANS. These Guides were third year university Health Science students with interest and experience in physical activity, nutrition and health promotion. They were initially screened for suitability, before undertaking training and received a comprehensive Guide's

manual. Their role was to provide support to participants, which included coordinating regular group meetings and maintaining telephone/email contact. The Guides were accessible for information sharing and answering questions. They arranged meeting times and venues to suit the majority of group members, and maintained a project diary to record interactions with participants and document feedback on the PANS program. Further details of the PANS program were described elsewhere (Burke et al., 2010).

Participants

The intervention group consisted of 248 participants aged between 60 and 70 years. Table 1 presents the sample demographic characteristics. Participants were recruited from Perth metropolitan suburbs with low or medium socioeconomic status, based on the Socio-Economic Index for Area (Australian Bureau of Statistics, 2008), a value derived from income, education level, employment status and skill level. They were insufficiently active, defined as “taking part in less than a minimum of 30 minutes of moderate physical activity on at least 5 days a week” (Brown, et al., 2008).

Table 1. Demographic characteristics of participants

Variable	
Age: mean (SD) years	65.96 (3.11)
Body Mass Index: mean (SD) kg/m ²	28.02 (4.63)
Gender: male	126 (50.8%)
Relationship status: with partner	179 (72.2%)
Work status: working	112 (45%)
Education level: primary school	14 (5.6%)
secondary school	119 (48%)
trade certificate/diploma	69 (27.8%)
university	46 (18.5%)

(n=248)

PROCESS EVALUATION METHODS

Group Guides

Guides recorded implementation of the program activities and distribution of resources in their project diaries, they documented information that they provided to their participants via the phone or email due to non-attendance at meetings, or when additional information was requested.

Brief questionnaire

Following program implementation and resource dissemination, participants were mailed brief self-administered questionnaires to evaluate the booklet, calendar, exercise chart and supplementary program resources (resistance band and pedometer). These questionnaires were modified from those used in the pilot (Burke, et al., 2008) and other studies (Jancey,

et al., 2008; Lee, et al., 2011). The printed copies were non-identifiable to encourage honest responses. Participants were invited to rate specific features and suggest possible improvements by commenting on what they particularly liked or disliked about the resources (United States Department of Health and Human Services, 1992). A 5-point likert scale was used for specific feedback on the resources. Respondents were required to circle the number closest to statement they agreed with (e.g. *useful to not useful, relevant to not relevant, suitable to not suitable, strongly agree to strongly disagree*). These scales were then collapsed into a dichotomous variable e.g. 'agree' and 'disagree' as presented in Table 2. Respondents were required to respond 'yes' or 'no' to the resources questions (e.g. pedometer / resistance band).

Post-intervention evaluation

Additional process evaluation was conducted after the completion of PANS. Using a mailed questionnaire, participants were solicited about their intention to continue using the program resources, their overall perception of the program, and what improvements could be made. A five-point likert scale ranging from 'strongly agree' to 'strongly disagree', was used for feedback on the program. These scales were then collapsed into a 'agree' (combining strongly agree and agree) versus 'disagree' (combining strongly disagree and agree).

Exit interviews

Twenty exit interviews (10 completers, 10 non-completers) were conducted via telephone by a trained researcher (first author). Names of participants were randomly selected from the lists of program completers and non-completers until 10 participants had been interviewed from each group. When a selected participant did not answer the telephone

after three attempts, or failed to reply to messages left, the next person on the list was contacted. Each interview took approximately 20 minutes to complete. The exit interviews contained questions that were open ended. Questions included what participants thought about: the program and materials provided; their perceptions of the PANS Guides; whether the program encouraged them to make changes to their levels or types of physical activity; and if they had made any changes to their diet in relation to program information. The exit interview intended to identify the preferred design aspects that encouraged participation and involvement, as well as feedback on resources and Guides.

RESULTS

Group guides

The Guides reported that the group preference for regular phone contact or face-to-face meetings varied, with some participants requesting only phone contact or information via email. The total number of meetings across groups ranged from three to seven, with one to 10 participants attending each meeting. The Guides claimed that most participants wanted to continue holding such meetings. Locations of meetings were convenient to the majority of participants who attended, as this was negotiated between Guides and group participants. Participants reported the meetings as “*very interesting, useful, supportive, and motivational.*” One senior commented that he “*felt informed by others in the group and appreciated their contributions on how to deal with and manage similar problems.*” Other comments included: “*the meetings make you commit to your physical activity goals, as you have someone to ask you what you have done.*” Feedback from Guides confirmed that topics included in the program seemed to be relevant; some topics were dealt with briefly, as participants appeared more knowledgeable, while others were discussed at great length. Again, this varied considerably between groups. Participants also indicated that ongoing

telephone calls or reminder emails were motivating and encouraging. The Guides reported that participants worked well together and motivated each other, as there were “*lots of chatting and laughing,*” and “*they seemed to get along well on a personal level.*” The Guides also stated that some participants had regular contact with each other outside the meetings and arranged to walk together. Participants reported that they left the program due to health issues, injuries, the need to care for family and/or friends, vacation and work commitments.

Booklet and written materials

Participants enjoyed the home-based exercise component of the booklet and found the exercises clearly described. A typical positive comment was: “*the stretches in the booklet are actually taught by my physiotherapist and I found them similar to my daughter’s yoga stretches.*” The participants were more likely to use the resources if “*the professional said so, and young people do so.*” A number of participants reported completing the exercises whilst watching television or sitting. Some suggested the provision of a recording table, similar to the pedometer table already provided, would be useful to count the number of exercises performed. When it came to dietary advice, participants found shopping hints and advice on portion sizes helpful. They also enjoyed goal setting, commenting: “*It’s a good idea, as I often write down tasks and tick them off when I complete them. It gives me a sense of achievement.*” When asked about improvements to written materials, a request was made for more healthy recipes that were easy to prepare and suitable for one or two people, rather than a family of four. Other requests included more backstretches, hints on healthy alternative ingredients to substitute in recipes and extra links to relevant websites.

Pedometer and resistance bands

Participants confirmed the pedometer was a motivating and useful tool that helped them reach their physical activity goals. One Guide commented, “*some participants religiously kept track of the amount of steps they took daily,*” and “*appreciated such an easy/quantifiable method of tracking activity.*” With respect to incidental physical activity, participants expressed their appreciation with positive comments such as: “*I never thought to walk to the shops*” and “*before this program I would have driven.*” They also confirmed the resistance band was useful: “*I could feel it working as I performed the strengthening exercises.*” “*I was surprised how sore my arms felt the next day,*” and “*I really enjoyed using it.*” Several participants favoured more practise and supervision in how to use the resistance band.

Brief questionnaires

Brief questionnaires on the booklet (n = 177: 71% response rate (RR)) and supplementary program resources (n = 167: 67% response rate (RR)) were returned by the majority of participants. As shown in Table 2, the majority of participants reported that the booklet ‘provided useful advice’ (88%); ‘was suitable for their age group’ (84%); ‘encouraged them to think about physical activity’ (78%); ‘encouraged them to think about nutrition’ (70%); and they found the messages were relevant’ (71%). Suggestions to improve the booklet included offering alternatives for lactose intolerant individuals; more healthy recipes for two, particularly using legumes; a section on staying mentally active; and to reduce the booklet size to fit into a handbag.

The majority of participants reported that they ‘used the exercise chart’ (74%) and claimed it ‘encouraged them to practise recommended exercises’ (62%). They reported the exercise

chart was ‘*easy to follow, had clear instructions, and provided a range of helpful exercise options.*’ Sixty-six per cent of the participants thought the calendar ‘encouraged them to think about physical activity’; ‘encouraged them to think about nutrition’ (55%); and contained ‘contained useful information’ (57%). Suggested improvements for the calendar included providing more information about physical activity and nutrition and a recipe of the month.

A majority of the participants reported that they ‘used the pedometer’ (91%) and 78% ‘recorded their daily steps’. The majority of participants reported using the resistance band to complete strength exercises (63%).

Table 2. Participant responses to statements relating to supplementary program resources

	Agree/Strongly agree with statement
Booklet (n = 177) RR = 71%	
Useful advice in booklet	88%
Easy to understand	85%
Suitability for age group	84%
Interesting information in booklet	80%
Attractive booklet	80%
Encouraged me to think about physical activity	78%
Relevance of messages to me	71%
Encouraged me to think about nutrition	70%
Exercise chart (n = 167) RR = 67%	
Suitability for age group	74%
I used the exercise chart	74%
Found exercise chart useful	70%
Encouraged me to practise PANS exercises	62%

Calendar (n = 167) RR = 67%

Encouraged me to think about physical activity	66%
Suitability for age group	64%
Attractive calendar	61%
Useful information on calendar	57%
Encouraged me to think about nutrition	56%

PANS resources (n = 167) RR = 67%

I used the PANS pedometer	91%
Encouraged me to take more steps	78%
Recorded number of steps I took	77%
I used the PANS resistance band	63%

Post-intervention evaluation

Feedback from post-program evaluation (n = 176; 71% response rate (RR)) verified that the PANS program and resources were relevant and appropriate for this population.

Eighty-four per cent of respondents reported that they ‘became more aware of their health and wellbeing’; ‘their nutrition and eating habits improved’ (55%); most ‘felt fitter’ (53%); and most reported that they ‘will continue to stay active when the program concludes’ (71%). The majority agreed the Guides provided ‘helpful guidance’ (73%); ‘motivated them to be active’ (68%); and ‘improve their diet’ (63%). The results are presented in Table 3.

Table 3. Participants' perceived benefits of the PANS program

Agree/Strongly agree

Since starting the PANS program ...

I have become more aware of my health and wellbeing 84%

I feel fitter 53%

My Group Guide ...

Encouraged me to do well 77%

Gave me helpful guidance 73%

Motivated me to be more active 68%

Motivated me to improve my diet 63%

I believe I will continue to use the PANS materials to help me ...

Stay active when the program concludes 71%

Stay active in 6 months time 67%

Stay active in 12 months time 60%

My physical activity has changed since starting PANS

I am generally more active 59%

I walk more often 57%

I have become more involved in new activities 31%

My nutrition/eating habits have improved since starting PANS 55%

(n = 176):RR = 71%

When asked how the program could be improved participants suggested '*getting more people involved*', '*finding a method to maintain meeting attendance*', '*providing a few hands-on cooking sessions*' and '*making it an ongoing, government funded program for senior-card holders*'.

Exit interviews

Program completers (n = 10) reported that PANS was appropriate and informative, particularly the layout of materials. They found the physical activity aids (resistance band and pedometer) useful and motivating. They enjoyed meeting people their own age and preferred meetings to be regular. Participants indicated that the program “*reminded me about good eating habits and made me more conscious of my nutrition.*” Some participants were trying to improve their diet: “*I am now checking food labels and trying to eat more fruit, nuts, and vegetables.*” “*I am eating less bread*” and “*increasing my consumption of peas and nuts.*” “*I even tried stuffed potatoes, which I have never eaten before.*” However, PANS could be more appealing if it has “a longer time frame,” “some hints on how to lose weight,” “more exercises” and “larger font size on the exercise chart.”

According to non-completers (n = 10), the main reasons for dropping out were that they ‘did not want to fill out questionnaires,’ ‘previous experience with exercise programs had proved difficult,’ ‘lack of self-motivation,’ ‘transport issues,’ ‘recent illness’ and ‘time constraints due to work and other commitments.’

DISCUSSION

Reaching, recruiting and retaining older adults in community-based interventions can be challenging. To encourage involvement of participants in this 6-month home-based physical activity and nutrition program, a number of strategies and initiatives were trialled, including Group Guides, written materials (booklet, calendar and exercise chart) and activity aids (pedometer and resistance band). Comprehensive process evaluation was conducted to determine whether these strategies had been implemented as planned, and

appropriately for the priority population. Feedback and opinions were solicited using a variety of approaches. The response rate for the questionnaires were reasonable, ranging from 61% to 71%.

The provision of Guides was a valuable component of the intervention, as demonstrated by the positive feedback from participants, who considered them encouraging and motivating. Previous research conducted in the USA and Australia have shown Group guides, filling the role of walk leaders, facilitators, health educators or phone counsellors, to be beneficial to the outcomes of intervention programs (Griffin, et al., 2010; J Jancey, et al., 2008).

Post-intervention evaluation confirmed that the regular telephone or email contact by Guides could increase participant's motivation, adoption and adherence to the program. Furthermore, exit interviews suggested that ongoing reminder emails and telephone calls were encouraging, while feedback from Guides verified that participants were receptive to the information provided. The seniors preferred the flexibility of telephone or email contact, as it suited their busy lifestyle. However, the optimal type and amount of contacts appeared to vary between individuals. Studies with older adults in Canada, USA, UK and Australia have reported that the provision of telephone contact can stimulate a positive change and/or increase adherence to physical activity (Griffin, et al., 2010; Morey, et al., 2009), however, limited research has been conducted with email delivered interventions with this age group (Dinger, Heesch, Cipriani, & Qualls, 2007).

The intervention group meetings were also beneficial for supporting participants to establish and reach personal goals, physical activity maintenance, as well as facilitating social support amongst participants. Some participants reported that they had commenced

regular walking together, potentially revealing the long-term positive elements of the optional group meetings. This finding was consistent with the literature concerning benefits of group meetings (Cox, Burke, Gorely, Beilin, & Puddey, 2003).

The process evaluation indicated the written materials were relevant and motivated participants to improve their physical activity and dietary behaviours. Previous intervention trials have also successfully incorporated information booklets on physical activity (balance, strength, endurance) and dietary advice within programs (Burke, et al., 2008; Greene et al., 2008; Morey, et al., 2009). In addition, the PANS booklet encouraged participants to set personal goals, while the calendar assisted with recording of progress, and the exercise chart acted as a visual cue for action. A previous study similarly reported positive behavioural change when participants were encouraged to set their own short-term goals (Greene, et al., 2008).

The process evaluation results demonstrated the value of adopting a variety of strategies to cater for participants' preferences (Griffin, et al., 2010; Jancey, et al., 2008). The PANS program offered flexibility through the provision of written resources and additional materials, motivational telephone calls and/or emails, as well as the opportunity to attend optional group meetings in the local area. Consequently, participants could adapt the program to suit their individual needs. For example, some seniors preferred working through the program independently, whereas others enjoyed the group support. This semi-tailoring of the intervention allowed participants autonomy to work through the program at their own pace, leading to a positive outcome (Burke, et al., 2008). As with other programs (Burke, et al., 2008; Jancey et al., 2007), the main reported reasons for attrition were health

issues, injuries, caring for family and friends, time constraint, work and other commitments, and not the program design.

Limitations

Although additional process evaluation could have been conducted for this project; it was considered more important to concentrate on program development and delivery to ensure the PANS intervention was implemented efficiently and appropriately for the target group. Evaluation based on self-report data was deemed realistic and sufficient within the allowed timeframe. The PANS intervention was limited to six months because of budgetary and resource constraints.

CONCLUSION

Process evaluation is integral to program evaluation, providing detailed information on the implementation of the program components. Such information is an essential part of the evaluation cycle, which helps inform the improvements of future health promotion programs. The PANS process evaluation provided an opportunity to obtain feedback and advice from the participants on how the program and resources could be improved. The triangulation of process evaluation data had the advantage of validating results from different sources that the PANS program and associated resources were appropriate and effective; and enabled the seniors to identify, establish, and achieve their physical activity and nutrition goals.

The process evaluation data indicated that PANS engaged a significant proportion of the participants. The seniors were generally positive about the program in terms of improving their physical activity and eating behaviours, thereby indicating that the program had been

implemented and delivered as intended. The information and suggestions for refinements will be useful to make future interventions more relevant to the priority population.

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