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Original Paper

Report on Creating a Selected Person's Physical Activity Goals through Physical Activity Assessment and Consultation

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Abstract

This study explores the development of personalized physical activity *(PA) goals for a 57-year-old Scottish male undergoing retirement transition, utilizing physical activity assessment and consultation. The International Physical Activity Questionnaire-Long Form (IPAQ-LF) and the Transtheoretical Model (TTM) were employed to evaluate the participant's PA levels, sedentary behavior, and readiness for behavioral change. Findings revealed a moderate PA level meeting WHO guidelines (150+ minutes/week of moderate activity) but highlighted excessive sedentary time (7.7 hours/day) and insufficient muscle-strengthening exercises. Through tailored consultation, SMART goals were established, including daily brisk walking, cycling for errands, community engagement, and reducing sedentary intervals. The participant, identified in the contemplation/preparation TTM stages, demonstrated improved self-efficacy and commitment to gradual PA enhancement. The study underscores the effectiveness of integrating assessment tools and behavioral models to address retirement-related lifestyle transitions and promote healthy aging.*

Keywords

Retirement transition, Physical activity goals, Transtheoretical model (TTM)

Introduction

Lifestyle is closely related to people's physical health. Physical activity (PA) is defined in the WHO (2020) as "any physical activity involving energy expenditure produced by skeletal muscle". All physical activities that are of sufficient duration and intensity can provide health benefits. Sedentary behaviour (SB) is defined as sitting, lying and reclining positions that consume ≤1.5mets while awake (Tremblay et al, 2017). There are also reports demonstrating a high correlation between sedentary behaviour and non-communicable diseases (Patterson et al., 2018). Whereas the retirement transition is an important factor in changes in people's lifestyles and behaviours, this period is widely regarded as a major life transition that includes physical activity (PA) and mental health changes, and physical activity is a key

component of healthy ageing. Healthy ageing is defined as "the process of developing and maintaining functional abilities" (WHO, 2015). As the middle-aged and older workforce increases, the number of people entering the retirement transition increases significantly (Wang, 2013). The retirement transition can be divided chronologically into three stages (Hewitt et al., 2010). During the retirement transition, people's PA levels generally change, with each distinct stage having a unique pattern of PA. Research by McDonald et al. (2015) has shown how people's PA levels may decline if they settle out of retirement mode. The ecological framework is beneficial in helping to understand the impact of multiple factors on physical activity (King & Gonzalez, 2018), while the transtheoretical model (TTM) can help to understand individual behavioural factors. This paper investigates a Scottish man in retirement transition by using physical activity advice adapted from the TTM (Kirk et al., 2007) and makes recommendations for improving physical activity levels based on relevant guidelines.

Method

Participant Satoru is a 57 year old adult, male, now living alone in Edinburgh. He used to work as a music teacher in a secondary school, but just retired a fortnight ago. He is very uncomfortable with the loss of his work status and wants to find alternative activities to replace his work activities and to maintain his weight. The participant was 57 years old and met the WHO age range for adults (18-64 years). The time spent on daily living was redistributed in a way that ensured an improvement in his physical activity level. For the participant, the adult section of the UK Chief Medical Officers' Physical Activity Guidelines (COM) (2019) was appropriate.

The long version of the International Physical Activity Questionnaire (IPAQ) was selected for participant to complete the self-assessment due to the need to understand the participants' seven-day physical activity review. The short version of the IPAQ provided some simple information on physical activity. In contrast, the longer version of the IPAQ also collected more detailed information on household and yard activities, occupational activities, and sedentary time spent. Although subjective factors such as participant bias and recall errors may affect the reliability of self-assessment questionnaires, however, IPAQ has been shown to have validity and acceptable reliability in adult populations (Craig et al., 2003). One approach to analysing data from the IPAQ-LF is to weight each activity according to energy requirements and derive scores in MET-minutes (Fan, Lyu, & He, 2014).

The physical activity consultation, adapted from Kirk et al. (2007), was conducted by telephone conference based on the participant's self-assessment results. The consultation process consisted of five steps, which were more concise than the ten steps of the original version, and the TTM was applied to create a profile of variables related to physical activity. the TTM suggests that individuals go through five stages (pre-contemplation, contemplation, preparation, action and maintenance) when changing their behaviour (Kirk et al., 2007). In conjunction with the participant's self-efficacy and decision-making balance, intervention strategies differed when participant fell into different stages. The whole consultation process was recorded to facilitate subsequent review.

Table 1 Five steps of the modified consultation

Physical Activity Consultation Step	Application of TTM	Practical Application
Step 1 – Determine physical activity history and current behaviour	Assessing stage of change	Feedback based on IPAQ results. Interpretation of PA and individualised development of measures.◦
Step 2 – Explain physical activity intensity and highlight benefits	Initiate process of change	Use existing guidelines and evidence to highlight the benefits of PA. The consultant addresses participants' concerns about the process and expected outcomes at this step, improving knowledge.
Step 3 – Discuss the positives and negatives associated with physical activity	Provide and work through a decision balance	Discussing the barriers to PA with participants may lead to identifying ways to overcome them. The goal of this step is to generate motivation to improve PA levels.
Step 4 – Identifying and generating support	Feeding the process of change	Consider giving participants the opportunity to overcome or work around some of their barriers. Find social support.
Step 5 – Goal setting	Building self-efficacy	By increasing the participants' knowledge about PA and the benefits, it increases their internal motivation. Next the consultant seeks to distill this into SMART* goals.

* Specific, Measurable, Attainable, Relevant and Time Bound.

Results

The IPAQ-LF provides data on total continuous PA, expressed as MET-minutes for the scores, in addition to a more detailed understanding of PA domains and intensities (Craig et al., 2003). Table 2 shows the results of the IPAQ-LF for the participant (PA vs. SB). Table 3 provides a breakdown of the total weekly force activity and intensity. Both tables record the physical activity of the participant and help to develop individualised physical activity recommendations for the participant.

Table 2 Results from IPAQ Long presented by domain sub-scores expressed as minutes, days and MET-Minutes.

Domain	Intensity/activity (METs)	Minutes per day	Days per week	Total METMinute/ Week by	Total METMinute/Week by domain
Work	Walking (3.3 METs)	-	-	-	-
	Moderate (4 METs)	-	-	-	
	Vigorous (8 METs)	-	-	-	
Transportation	Walking (3.3 METs)	30	3	297	297
	Cycling (6 METs)	-	-	-	
Domestic	Vigorous Garden (5.5 METs)	-	-	-	415
	Moderate Garden (4 METs)	10	7	280	
	Moderate House (3 METs)	15	3	135	
Leisure Time	Walking (3.3 METs)	10	7	231	231
	Moderate (4 METs)	-	-	-	
	Vigorous (8 METs)	-	-	-	
Sitting		Hours per day	No of Days	Total Minutes	Total Combined Minutes Sitting
	Weekday Hours	8(480 mins)	5	2400	3240
	Weekend Hours	7(420 mins)	2	840	

Table 3 Results from IPAQ Long presented by intensity sub-scores expressed in MET-Minutes/Week.

Physical Activity Intensity	Total MET-Minutes/Week
Total Walking	528
Total Moderate	415
Total Vigorous	-
Total Continuous	**943**

According to the IPAQ Research Committee (2004), the score types and criteria for the IPAQ-LF are defined. It classifies people's physical activity levels into three categories: "Inactive", "Inactive" and "HEPA active". Table 4 provides more information on the classification.

Table 4 IPAQ Long Categorical Score definitions and definition criteria.

Categorical Score IPAQ	Definition Criteria
Inactive	• No activity is reported OR • Some activity is reported but not enough to meet Categories 2 or 3.
Minimally Active	Any one of the following 3 criteria • 3 or more days of vigorous activity of at least 20 minutes per day OR • 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR • 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.
HEPA active	Any one of the following 2 criteria • Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week OR • 7 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week

According to the classification criteria in Table 4, participants were physically active for more than 30mins per day, meeting the condition of "5 or more days of moderate-intensity activity or walking of at least 30 minutes per day. "The condition of "Minimally Active" was met.

The results of the participant's IPAQ-LF were used as a basis for planning and directing physical activity in conjunction with the consultation results. Table 5 shows the results of the consultation regarding the participants, using the 5 steps in Table 1.

Table 5. Summary of Physical Activity Consultation

Physical Activity Consultation Steps	Summarised Output
Feed forward from IPAQ Long analysis	The participant retired a fortnight ago, using a score of no physical activity in the work area. There were questionnaires available to conclude that the participant's current level of physical activity was at the moderate stage, probably due to some moderate intensity activity and walking. Although the WHO standard of at least 150 minutes per week was met, it was not clear that the intensity was not. Also, the participant's level of physical activity was significantly reduced compared to the pre-retirement period.
Step 1 – Determine physical activity history and current behaviour	The participant lives alone, on the ground floor, and has a small garden outside the house. He sits in the garden every morning and reads a book. He occasionally plays the piano or watches TV in the afternoon, about once or twice a week. Every evening he goes out for a ten-minute walk. Once a week he drives to a large supermarket to buy consumables, a journey of about five minutes. His daughter comes back to visit him about once a month to help him with his garden and they sit and talk or watch a film together. Before retiring, the participant was an educator and worked as a music teacher in a secondary school. He worked four days a week and attended classes for an average of four hours a day. It was about a half-hour walk to and from work. On weekends in the past, he fished or went for walks with friends. He is not comfortable with his retirement and none of his friends have retired yet. He hopes to find suitable activities to redistribute his time as a way of adapting to retirement. He knows that physical activity is linked to his health and wants to maintain his current weight. He would welcome guidance and advice for a more appropriate and scientific PA programme. Deduction = The participant is considered to be in the thinking and preparation phase of TTM based on his knowledge of the relationship between physical activity and health and a strong desire to change his current situation.
Step 2 – Explain physical activity intensity and highlight benefits	The participant was shown the "adult" physical activity information section of the CMO (2019). He was pleased to be able to meet the minimum 150 minutes of PA and regretted that his PA levels had decreased and that he did not perform aerobic and muscle strengthening physical activity on a weekly basis. He could understand why these

	exercises were necessary, but admitted that he could not guarantee that he would be able to complete the aerobic and muscle strengthening exercises well. Nonetheless, the session kept him positive about the transition to retirement. Deduction = He has a good base of physical activity and might try to incorporate aerobic and muscle strengthening exercises.
Step 3 – Discuss the positives and negatives associated with physical activity	The participant accepts the idea that physical activity can bring benefits. And he currently has a lot of free time which he can use. His home is in a good location. He has a strong desire to get through this transition. The participant's PA self-efficacy is low and he believes that after retirement he can rest and there is no need to do a lot of physical activity. The participant acknowledges that he is afraid of getting injured during exercise and he admits that doing physical activity alone would be too much for him to sustain. Deduction = He has a good physical base as well as external conditions, but low self-efficacy. The key to supporting behavioural change is to provide a workable goal.
Step 4 – Identifying and generating support	The participant accepted the suggestion of a brisk walk every day and agreed that he could develop new habits at this stage. The advisor mentioned the benefits of new habits for adjusting and adapting to life after retirement and the importance of a healthy old age. The participant mentioned the existence of a free park next to where he lives. Opportunities to participate in community activities were discussed and the idea that he could make new friends during physical activities was accepted. Further discussion was held on how to learn about preventing sports injuries through websites or offline classes. Participant's concerns about sports injuries appeared to have decreased. Deduction = Using the idea that participant wanted to develop new habits and make new friends, combined with the support provided by the community, provided an effective means of developing walking in the park and attending community events into new activity habits.
Step 5 – Goal setting	As the intensity and duration of PA needs to be taken into account, the consultant recommends that a cumulative total of 150 minutes or more of physical activity per week is maintainable. And the intensity can be increased over time over the next six weeks. A brisk walk of 30 minutes a day is the basic goal. Due to the need to increase aerobic training and the additional health benefits that would result from muscle strengthening activities on 2 or more days per week, the advisor suggests that the weekly drive to the supermarket could be changed to a bike ride

	and that you do your own gardening. The consultant will provide a briefing on the recommendations after the consultation (Appendix 1). Deduction = The consultant provides a personalised programme of improvement and advice on how to overcome physical activity barriers through the participant's individual situation, resulting in 'SMART' goals. Participant maintains or increases PA levels based on current physical activity levels and interests.

According to WHO (2020), the participants' current level of physical activity appears to meet the recommendation of 150-300 minutes of moderate intensity physical activity per week, but it is not certain how intense the participant's PA was. Regarding the muscle strengthening exercises mentioned in the guidelines, participant did not meet the recommended standard. Although a baseline PA level existed for participant, the average sedentary time of participant was approximately 7.715 hours per day, which was still above the average sedentary time (6.7hours per weekday) compared to Scottish males and even higher than adults who were advised to shield (7.3 hours per weekday) (Scottish Health Survey, 2020). COM (2019) concluded that when adults are sedentary for more than 6-8 hours per day it leads to a higher risk of cardiovascular disease, while this increased risk is not associated with MVPA levels. This means that participant need to break up prolonged sedentary behaviour with light physical activity.

Therefore, according to the above, the participant had a medium level of physical activity and was in the contemplation and preparation phase of the TTM.

Discussion

The advice given when conducting the conference call was simple in order to increase the engagement and expectations of the participant. A deeper level of analysis can make the evidence for the advice stronger. When the participant is in the contemplation and preparation stage, the advice focuses on how to overcome obstacles and increase motivation to improve self-efficacy (Kirk et al., 2007). response are three ways in which self-efficacy can be improved (Bandura, 1977). According to activity theory (Atchley, 1989), the need for people to find activities to replace their jobs after retirement may be an opportunity to increase PA levels. In this consultation, the participant had an initial PA level and also had the desire to reallocate their daily life time in a rational way, which may have provided the participant with the premise of an emotional response to promote self-efficacy. Also, verbal persuasion was completed during this consultation, meaning that mastery of skills and enhanced emotional feedback were the focus of the recommendations made.

With regard to the "SMART" goals that have been summarised, it is recommended that the existing ten-minute daily walk be increased to 30 minutes of brisk walking per day, that the weekly drive to the supermarket be replaced by a bike ride; that community activities (e.g. walking, ball games) be undertaken once a week or fortnight; and that gardening be done independently. After six weeks if

adapted the intensity can be increased, for example by adding muscle strengthening exercise. In addition, it is recommended to stand up and move around for five to fifteen minutes after every hour of sitting time, thus reducing sedentary behaviour. These recommendations are clear, specific and achievable; they are increases in duration and intensity from the participant's original level of PA. Also compared to vague recommendations, clear duration as well as frequency enables the goals to be measurable. In addition, the goals were set in stages, producing more progressive goals that allowed participant to achieve a sense of achievement while ensuring a cumulative level of PA. There were two main deterrents to physical activity, the fear of injury during exercise and the lack of friends to join them. However, simple suggestions for physical activity based on walking and more knowledge of exercise may reduce the fears, while community activities may also help to make new friends and alleviate feelings of isolation.

The study by Socci et al. (2021) showed that walking is the preferred mode of physical activity for people in transition to retirement. This may be due to the fact that the time requirements for walking are flexible and can be adjusted according to individual needs as well as environmental factors. For retirement transitions, people generally choose easier activities instead of more physically demanding ones, which allows them to adapt to the transition to retirement (Lahti et al., 2011). In this context, walking seems to be able to include socialising, recreation and leisure (Berger et al., 2005), especially when with friends and partners. Attending community events can also help participant to make new friends. Furthermore, research suggests that having fun in physical activity further promotes the acceptance of PA among middle-aged and older adults, perhaps because emotional value is also a key to healthy ageing (Devereux-Fitzgeralr et al., 2016). The purpose of walking without the use of a precise instrument such as an accelerometer to measure steps is to reduce the difficulty of the goal to increase the success of the goal, thus increasing self-efficacy and satisfying the participant's sense of achievement (Kirk et al., 2007). Walking without the aid of any measurement tool can be reduced to purposeful walking for participant and Tudor-Locke et al. (2018) suggest that approximately 100 steps/minute for adults is lightweight, not strenuous and allows for successful completion of a conversation. This can be used as a simple criterion for judgement.

Secondly, the CMO (2019) refers to the need for adults to do activities to develop and maintain strength in key muscle groups and therefore encourages participant to change their transport to the supermarket to cycling and to be able to do gardening independently, thus setting the stage for incorporating muscle strength training and resistance training after six weeks.

The exercise intensity of the target for the first six weeks was not too intense, which reduced the risk of exercise injury, however as the participant lived alone, he may have been at risk of having difficulty living alone after the injury. However locating the exercise in a high traffic park as well as a community event will reduce the risk of the participant being injured alone. It is also important to stress to participant that any physical discomfort needs to be stopped immediately and a doctor consulted so that the injury can be reduced in time and the next target plan can be adjusted.

In addition to the increase in PA levels, it is recommended that the participant move for five to fifteen

minutes after an hour of sitting to break the sedentary behaviour. Simple unloaded resistance exercises such as knee extensions are recommended to break the sedentary behaviour while providing a foundation for strengthening exercises after six weeks. In addition, it improves balance and functional ability and reduces the risk of falls (Alves et al., 2020; Šarabon et al., 2020).

Reflection

In line with the CMO (2019) guidance, the IPAQ-LF provides detailed information about the participant in a number of areas, including the duration of the sitting. This assists in determining the participant's current level of activity and the subsequent provision of personalised advice. The consultation is designed to gain a deeper understanding of the participant's living environment and habits, exaggerating the results of the IPAQ, and the discussion process with the participant helps to understand the participant's wishes and find the goals that are most acceptable to the participant, thus allowing for an increase in goal completion.

Retirees adapt to life changes according to their personal circumstances, with research suggesting that some will continue to work and some will transition to employment or volunteer work (Cahill et al., 2019). Particularly for higher education workers, who may continue to choose to develop in their academic field, reviewing the consultation as a whole, I ignored the participant's status as a teacher and did not ask if he wanted to increase physical activity in relation to his academic status. In addition, there were some jumps in information, and although maintaining a good atmosphere during the consultation process can lead to a good experience for the participant, the jumps in information input may have caused me to miss some information.

The participant also mentioned that he wanted to maintain his weight, but as weight maintenance requires not only physical activity but also dietary control, I did not talk about maintaining weight in the objectives.

Conclusion

Overall, self-assessment combined with counselling was an effective means of setting personalised PA goals. the results of the IPAQ analysis indicated an initial moderate level of physical activity and after counselling the participant was found to have relevant exercise knowledge as well as initial motivation. This was followed by the initial development of clear, specific, measurable and achievable short-term goals based on existing behaviours to increase PA levels through increased self-efficacy. Participant was encouraged during the consultation process and was able to act on the CMO Guidelines (2019) recommendations. Then, the information brief (Appendix A) provided participant with a more vivid visualisation of the suggested goals, which were likely to be achieved. The success of short-term goals can create opportunities for subsequent goal adjustments as well as enhanced training, and is the basis for subsequent long-term goals, providing the opportunity to persist in accomplishing long-term goals.

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