Unit No. 8

MONITORING AND SUPPORT FOR WEIGHT LOSS AND MAINTENANCE

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ABSTRACT

It is well-established that physical activity is an essential component of weight management programs. This article aims to provide a practical guide to physical activity counselling for weight management. An overview of current physical activity guidelines, a stage-based intervention framework, and strategies for monitoring physical activity levels will be presented.

Keywords: Physical activity, weight, transtheoretical model

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INTRODUCTION

Physical activity (PA) is endorsed as an integral part of weight management programs by public health agencies, scientific and medical organisations.[1-3] Engaging in sufficiently high energy expenditure PA results in a negative energy balance and consequent weight loss.[4] This may occur with or without the help of caloric restriction.

This article aims to provide a basic understanding of how to assist individuals in adopting and adhering to PA recommendations for weight management. The first section summarises current PA guidelines, followed by introducing a stage-based intervention framework for PA counselling. Finally, strategies for monitoring PA levels are discussed.

PHYSICAL ACTIVITY GUIDELINES FOR WEIGHT MANAGEMENT

Energy expenditure from PA is contributed by three distinct components: (i) sedentary behaviour (*i.e.*, activities performed in a sitting, reclining or lying posture), (ii) non-exercise activity thermogenesis (*i.e.*, energy expended for all activities excluding sleeping, eating, or structured exercise) and, (iii) exercise activity thermogenesis (*i.e.*, energy expended from structured exercise).[4] A comprehensive PA intervention should address all three areas as they have an additive effect on overall energy expenditure.

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Guidelines for sedentary behaviour and non-exercise activity thermogenesis

Due to modern technology's conveniences, most people spend long hours sitting at home, at work, and during leisure activities. This impacts energy expenditure via two avenues: (i) sedentary activities incur minimal energy costs compared to other activities and (ii) having spent more time sitting instead of moving around, non-exercise activity thermogenesis is also reduced. Such reductions in energy expenditure are estimated to be > 100 calories per day[5], contributing to the sustained positive energy balances that result in obesity.[1] Existing weight management guidelines recommend an increase in non-exercise and active leisure activities to minimise sedentary behaviour.[1-3] However, the optimal amount of non-exercise and leisure PA needed for weight loss is still unknown.[1]

Exercise guidelines

Based on the American College of Sports Medicine Position Stand, > 150 minutes of moderate-intensity PA per week promote modest weight loss of 2 to 3 kg. A dose-response relationship exists, whereby > 225 to 420 minutes of moderate-intensity PA per week results in 5 to 7.5 kg weight loss.[1] Resistance training does not seem to be an effective means of weight loss with or without caloric restriction. However, it is associated with numerous health benefits such as decreases in chronic disease risk factors, increases in lean muscle mass, and loss of body fat.[1]

As for weight loss maintenance, exercise is likely to be an effective strategy for maintaining a regular regimen.[6] Studies have proposed that 200 to 300 minutes per week of moderate-intensity PA reduces weight regain after weight loss.[1] Nevertheless, existing evidence is mainly based on observational studies, which are insufficient to determine causality.[1]

A STAGE-BASED INTERVENTION FRAMEWORK

Despite extensive PA promotion efforts in recent years, many are still not achieving the recommended guidelines. This suggests that simply providing knowledge of PA recommendations may be insufficient to produce behavioural change; a behavioural approach may be warranted. The transtheoretical model (TTM) is one of the most adopted behavioural frameworks for promoting exercise behaviours.[7] TTM classifies individuals into five different stages of

readiness to increase PA: (i) precontemplation (*i.e.,* no intention to be regularly active in the next six months), (ii) contemplation (*i.e.,* intending to be regularly active in the next six months), (iii) preparation (*i.e.,* intending to be regularly active in the next thirty days), (iv) action (*i.e.,* regularly active for less than six months) and, (v) maintenance (*i.e.,* regularly active for at least six months).[8] Individuals may progress linearly through the stages as they attempt behavioural change, or relapse at any stage after unsuccessful attempts.[8] Tailored interventions based on individuals' stage of readiness in the TTM effectively promote higher PA levels in many different populations.[9]

The following section provides examples of how specific behavioural (*e.g.,* goal setting, monitoring, rewards) and cognitive (*e.g.,* health education) strategies can be used within each stage to facilitate progression.[10] These strategies have been tactically placed to target specific processes of change, decisional balance, and self-efficacy levels associated with each stage.[11] A summary is provided in Table I. It is hoped that such a stage-based approach using the TTM will provide a structured and intuitive guide for practitioners new to PA counselling.

Precontemplation ⟶ contemplation

This stage-transition involves making physical inactivity a relevant issue in patients' life and prompting them to think about getting active. Start by providing information about how inactivity contributes to obesity and the benefits of regular PA.[7] Encourage patients to read more from multiple sources, including health promotion videos or educational brochures from reputable institutions, as well as news articles. This increases their awareness and knowledge of the subject matter. Next, ask patients to re-evaluate how the consequences of their inactivity may impact themselves and their significant others.[7] For instance, deconditioning from inactivity may reduce their mobility, denying them outdoor activities with their loved ones.

When patients start seeing the relevance of physical inactivity, you can attempt to elicit their thoughts about getting active. You can have your patients visualise the feeling of being physically active and relate to how it may help with their existing problems, such as having low energy and poor sleep.[7] It is also useful to discuss how some of their perceived PA barriers may be misconstrued.[7] For example, PA may be performed in short and accumulated bouts such that there is minimal disruption to patients' daily schedules. Addressing such concerns reduces the perception that the cons of getting active outweigh the pros.

Contemplation ⟶ preparation

Patients in the contemplation stage transit to the preparation stage by starting on some form of PA. Provide generic information about different PA options, fitness facilities, and exercise programs that may interest patients. Additionally, allow them to ask questions and express apprehensions about their PA barriers to explore potential solutions.[7] A supportive environment is more likely to encourage patients in their endeavour to find an enjoyable activity to adhere to.

Techniques to build patients' self-efficacy may also be used.[7] Self-efficacy refers to an individual's belief in their ability to execute behaviours necessary to attain specific goals.[12] Celebrate any efforts towards being active, even if patients are not achieving the recommended PA levels yet.[7] Attaining such milestones are forms of mastery experiences (*i.e.,* experiences of success) that contribute towards building self-efficacy.[12] Other methods include the use of vicarious experiences (*i.e.,* sharing 'success' stories of others with similar backgrounds and characteristics) and verbal persuasion (*i.e.,* providing feedback and encouragement that projects confidence in patients' abilities).[12] All in all, these measures encourage a positive outlook of being regularly active, motivating patients to adopt some form of PA.[7]

Preparation ⟶ action

Progressing from preparation to action stage entails turning sporadic PA attempts into regular participation. Kickstart this by setting short- and long-term goals using the SMARTS (*i.e.,* specific, measurable, action-oriented, realistic, timely, self-determined) principle. This provides direction to patients' PA efforts.[7] Next, assist in developing an appropriate plan to meet these goals and detail them into a formal contract to help patients commit to change.[7] Lastly, teach patients self-monitoring techniques such as tracking daily steps and active time.[7] Self-monitoring allows for more immediate feedback than is possible with practitioners; it also instils a sense of accountability in patients by actively involving them in evaluating their PA efforts.

While implementing PA plans, it is common for patients to encounter obstacles such as a lack of time, poor motivation, or rainy weather that disallows outdoor PA.[13] You may have continued discussions about these barriers during follow-up visits, adopting a facilitatory role for patients to generate potential solutions themselves.[7] When patients achieve their short-term goals, encourage some form of reward to reinforce the positive behavioural changes.[7] Extrinsic rewards are often used to initiate behavioural change.[14] Examples include praise from the practitioner or physical rewards such as a new pair of sneakers. Intrinsic rewards are intangible and come from within, such as feelings of accomplishment or a sense of enjoyment.[14] Intrinsic reinforcers cannot be provided directly, but practitioners may raise awareness of these thoughts and feelings by asking patients to document and share their positive experiences of getting active.

Action ⟶ maintenance

For regularly active patients, the next goal is to sustain the behaviour for longer than six months. Long-term adherence to regular PA can be difficult due to burnout, boredom, or

conflicting commitments.[15] Apart from simply providing verbal reinforcements, several strategies may help.

Firstly, encourage patients to exercise with their friends and family, or to join exercise groups. Social support from having reliable alliances, emotional attachments, and a sense of belonging helps foster long-term adherence to regular PA.[16] Secondly, assist patients in devising a reward system to remain motivated even after discharge from active intervention.[7] Intrinsic reasons for engaging in PA tend to be more effective in promoting long-term adherence than extrinsic reasons.[14] Potential strategies include encouraging patients to explore different types of PA to keep things interesting, or to join competitions for new challenges.[7]

Lastly, discuss relapse prevention strategies as setbacks are unavoidable.[7] High-risk situations that trigger relapses include holidays, illnesses, competing obligations, and poor weather.[17] When relapses happen, patients must not adopt an 'all or nothing' attitude. This discourages them from getting back on track even when the situations have passed.[7] One useful preventive measure is to adopt an "80:20" lifestyle, whereby patients exert good control of PA levels 80 percent of the time and allow less control 20 percent of the time on special occasions. Another useful tip is to develop a warning system for identifying potential PA lapses. For instance, missing planned PA or taking a break three times in a row can be noted as red flags. Patients should avoid having more than three red flags as that signifies a loss of control.

MONITORING PA LEVELS

To make behavioural changes, patients need to pay deliberate attention to their actions and the conditions under which they occur, as well as the effects of these actions. The information gathered serves as feedback and reinforcement for positive behavioural changes.[18] This describes the process of self-monitoring, which has been said to be the cornerstone of weight management interventions.[19]

Apart from raising behavioural awareness in patients, data from self-monitoring also allow practitioners to track patients' progress and provide support as needed. A recent study used self-monitoring data to identify early signs of behavioural disengagement that may result in significant PA lapses.[20] In the study, participants used a web-based and mobile tracking application to monitor their PA levels after completing a weight loss intervention. Their accounts were configured to send weekly records to practitioners and several behaviours were found to be associated with lower PA levels and higher body weight. These included a late onset of tracking, a higher number of tracking gaps, and the presence of extra-long tracking gaps (*i.e.,* > three months). Early identification of patients exhibiting such behaviour may be beneficial as it allows practitioners to intervene before any significant lapses in PA.

Despite its many uses, the efficacy of self-monitoring hinges on the accuracy, consistency, and timeliness of PA measurements. PA levels are usually self-reported using paper diaries and questionnaires, or objectively measured with pedometers and 'wearable' technologies. Research has found that self-reported PA tends to over- or underestimate true PA levels, likely due to recall and response bias.[21] In addition, sedentary behaviours and non-intentional PA (*e.g.,* performing household chores or commuting) are often done without thought. This makes it inherently difficult to capture and quantify the absolute level of PA.[21]

In contrast, electronic devices that directly measure PA levels work automatically in the background, making PA tracking convenient and accessible. Such devices are promising facilitators of behavioural change. A meta-analysis of 9 studies investigated the efficacy of pedometer-based walking interventions for weight management.[22] It was found that such interventions increased daily step count by 2000 to 4000 steps and resulted in a mean weight reduction of 1.27 kg (95 percent confidence interval 0.70 to 1.85 kg).[22] Another systematic review evaluated 25 studies that included 'wearable' technology as part of weight loss programs.[23] Most PA interventions comprised only step count prescriptions while four studies also included exercise routines. Results demonstrated that short-term weight loss interventions which included activity trackers were more successful in reducing body weight and increasing PA levels.[23] Hence, practitioners should recommend routine use of activity trackers if cost is not an issue for patients.

CONCLUSION

Given that high amounts of PA are needed to achieve even modest weight loss, patients may dismiss its importance in their weight loss journey. However, PA interventions' true value lies in the staggering health benefits and improvements in chronic disease management regardless of weight loss. These are also the primary motivations of all weight management programs. Therefore, practitioners should communicate the purpose and expected effects of PA interventions to patients during their first visit. This allows them to set realistic expectations and remain motivated to become physically active, even if their weight goals are not achieved.

Table I Strategies to facilitate stage transitions in the Transtheoretical Model

Stage transition	Example strategies
Precontemplation ⟶ *Contemplation*	
	◦ Provide information about how inactivity contributes to obesity and the benefits of regular PA
	◦ Explore how inactivity may impact patients and their significant others
	◦ Have patients visualise being physically active and how it will improve present health problems
	◦ Discuss any misconstrued PA barriers
Contemplation ⟶ *Preparation*	
	◦ Provide generic information about different PA options that may interest patients
	◦ Explore potential solutions to patients' PA barriers
	◦ Apply techniques to enhance patients' self-efficacy
Preparation ⟶ *Action*	
	◦ Set short- and long-term goals using the SMARTS principle
	◦ Assist in developing an action plan to meet PA goals
	◦ Teach self-monitoring techniques such as tracking steps and active time
	◦ Use extrinsic and intrinsic rewards to reinforce positive changes
Action ⟶ *Maintenance*	
	◦ Encourage working with others for social support in remaining active
	◦ Devise a reward system for continued motivation
	◦ Explore different types of PA to maintain interest and prevent burnout
	◦ Discuss relapse prevention strategies

PA, Physical activity

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LEARNING POINTS

- **A comprehensive physical activity intervention should address one's sedentary behaviours, non-exercise physical activities, and regular exercise routine.**
- **Current guidelines recommend at least 150 minutes of moderate-intensity physical activity per week to achieve modest weight loss. Resistance training may be added to promote the gain or maintenance of lean muscle mass and loss of body fat.**
- **Tailored, stage-based interventions using the Transtheoretical Model provide a structured and intuitive framework for increasing patients' physical activity levels.**
- **Although physical activity is not an effective means for weight loss than dietary or surgical interventions, it provides the numerous health benefits that many are seeking to achieve through weight loss.**