

ORIGINAL RESEARCH

COUNTING STEPS? HOW'S THAT WORKING FOR YOU? ASSESSING THE EFFECTS OF TRACKING MONITORS AND SOCIAL CONTEXTS ON FITNESS GOALS

Kim Baker¹, Sarah Pember², Xueying Zhang¹, Kim Bissell¹

¹ Communication & Information Sciences, University of Alabama

² Health Education and Promotion, University of Alabama

Corresponding Author: Kim Baker

Communication & Information Sciences, University of Alabama

Box 870172, Tuscaloosa, Alabama, United States, 35487

Email: krbaker1@crimson.ua.edu

ABSTRACT

Aims: Employing the transtheoretical model of behaviour change (TTM), this study considers the effects of digital health tracking tools on users adopting and continuing healthy behaviours. The TTM's five stages of change and 10 processes, as well as the model's inclusion of constructs related to social influences, guide an analysis of changes in behaviour.

Methods: An online survey examined the use of health monitoring tools and explored the potential predictors of engagement and perceived effectiveness of fitness monitoring tools. A total of 214 respondents were recruited that included students, volunteers through social media, and paid participants in compliance with a university Institutional Review Board.

Results: Goal-setting motivations were found to be positively associated with perceptions of tracking usage for fitness goals. One of the most significant findings was that users of fitness monitoring perceive their use affects others in their lives.

Conclusion: Findings indicate that behaviours related to goal-setting and self-efficacy are not necessarily reflective of users transitioning through TTM stages; yet, social support systems appear to affect goal-setting. Social media engagement was not shown to be a factor; yet, how participants' perceived that their health may impact others in their lives was. Future research should explore the role that sharing results may have in fitness behaviours, as well as considering the decision-making processes people experience when contemplating the purchase of a tracking tool and those who do purchase a device but discontinue using it.

Key words: Stages of change, health, goals, monitoring, social media

INTRODUCTION

Health tracking monitors that allow users to post results on social networking sites (SNS) have become increasingly popular.¹ The increase in fitness-related mobile applications has propelled the category to a top ranking among all mobile apps. More than 100,000 apps are now available, and sales for the category topped AUD\$5.2 billion in 2014 with an estimated increase to AUD\$34 billion by 2017.² Additionally, sales of sports watches and smart garments capable of detailed health tracking are expected to surpass the sales of health monitors within the next four years.³ Health goals can be tracked every moment of the day with increased customisation, including the monitoring of sleep patterns, calories consumed, exercises accomplished, and hydration. These technological advances have resulted in a new area of research and at least one dedicated conference for analysing what has been termed the “quantified self”.⁴ Understanding the effects these technologies have on encouraging the adoption and continuation of fitness behaviors is an important consideration for health professionals and researchers. The Transtheoretical Model (TTM) provides a means to analyse the potential effects.

The Transtheoretical Model (TTM) represents the process of behaviour change as five Stages of Change (SOC) through which individuals can progress as they contemplate, plan for, and attempt to modify and continue newly adopted behaviours.⁵ The model also includes 10 strategies influencing the processes of change. The model recognises that social support systems can effect behavioural changes, therefore, is helpful in considering the ability of fitness monitor users to share results and receive feedback from others on social networking sites (SNS).

The Transtheoretical Model offers a framework for conceptualising and measuring health behaviours and can be useful in developing intervention strategies.⁶ TTM also allows for an examination of potential reasons for failing to change or relapse. Researchers proposed that successful progression through TTM’s five stages—Pre-contemplation, Contemplation, Preparation, Action, and Maintenance—can be divided into 10 change

processes that are either experiential (i.e., emotional and cognitive) or behavioural (i.e., observable and socially situational).⁷ Progression through the stages and processes or, alternatively, a failure to proceed, relies on continual contemplation of pros and cons and self-assessments of abilities while implementing changes and continuing the new behaviours.

Researchers proposed that the stages of change occur within a set sequence of time.⁸ Precontemplators in the first stage are characterised as those not intending to change within the next six months; whereas, contemplators are those who do intend to change within six months. Those in the preparation stage intend to change within the next 30 days and are already taking steps to change. Those individuals who have implemented change are considered to be in the action stage, and, after more than six months of lasting behaviour change, an individual is considered to be in the maintenance stage.

The first stage, pre-contemplation, is marked by inaction with no intent to change behaviour, although awareness of change opportunities may increase, while the contemplation stage is developing awareness of change opportunities and imagining the self as emerging through changes into a new potential self.⁹ The transtheoretical model recognises the effects of environmental influences, such as media, peers, groups, and role models, to raise awareness of ways to change (i.e., pre-contemplation stage) and to prompt consideration of how engaging in change can affect the individual and others (i.e., contemplation stage).

In describing TTM, researchers have explained the relevant concepts of decisional balance (i.e., considering pros and cons toward adopting new behaviours) and self-efficacy—the belief in oneself to engage in healthy behaviours—as key components in individuals initiating and continuing new behaviours.¹ Research has indicated a consistent pattern as people progress through stages, with cons outweighing pros in the initial stages until perceptions shift toward more pros than cons before the action stage.¹¹ In a study of smokers considering quitting, the decisional balance process in which pros prevailed over cons, along with increased belief in

being able to quit (i.e., self-efficacy), were found to predict progression toward action and maintenance stages.¹² Perceiving oneself as possessing abilities to change is a key element for progressing through stages toward developing life-long habits. Researchers have found that self-efficacy is a significant factor in progressing from the preparation stage to the action stage.¹³ Researchers have also examined adolescent exercise behaviours within TTM to find self-efficacy increased with progression through the stages.¹⁴

The processes within TTM feature both individual abilities and the recognition of influences of social components. The goal-setting features users use for fitness monitoring may be instrumental for developing self-motivating behaviours and instilling self-efficacy. Additionally, the ways in which goal-setting results can be shared have the potential to affect others as well. Because entering goals is an indicator of the belief in being able to set and achieve goals, the assessment of goal-setting may be an important element to understand why people may transition toward TTM's action and maintenance stages. A recent review of 33 studies applying TTM to the behaviour of fitness centre members revealed no studies included the first two stages of TTM in analysis, and only one considered the preparation stage.¹⁵

For individuals in the pre-action stages, the effects of a fitness tracking tool may enhance the perceptions of the pros of change through the ease of obtaining tracking tools, a typically short learning curve of the features, and the increased popularity of devices. Fitness monitoring tools are easily available, whether by quick purchase of a mobile app download to acquiring more expensive wearable devices. Additionally, information about how to operate the tools is readily accessible on SNS and websites. As there are few studies to form conclusions about what variables predict advancement through the first two stages, it is unknown why individuals who successfully move forward differ from those who do not.¹⁶

Studies relating to self-regulation and control theories propose that monitoring progression toward goals is a vital process for setting and attaining goals

and ensures that desired goals are enacted. A review of 138 experimental studies totalling 19,951 participants either subjected to interventions for promoting goals or a control condition found that the amount of time spent engaging in monitoring mediated the effects of behavioural changes for goal attainment.¹⁷ Additionally, the findings showed that for moderation tests both recording the results and publicising the monitoring results had larger effects for obtaining goals.

In addition to goal-setting behaviours, the importance of social support within the stages and processes of TTM prompts a consideration of both the effects of others on individual behaviours and the effects of the individual's changes on others. TTM stages recognise the importance of social settings on initiating and maintaining new behaviours;¹⁸ thus, consideration of how individuals believe their behaviour will influence others is included as an area of interest for engagement in tracking tools. Additionally, social media sharing of monitoring results is an important area for considering the effects of mediated social environments on decisions to engage in fitness monitoring and continue as well as maintain healthy behaviours.

People are proposed as being psychologically motivated to be in social relationships to survive and thrive (see sociometer theory). Because social acceptance is desirable, the process of evaluating our own behaviour is linked to how we believe others will accept or reject us based on our behaviour and how we perceive our actions as affecting others. Being perceived as either excluded or included by others elicits affective responses of either "bad" (e.g., shame, inadequacy) or "good" (pride, confidence) feelings toward ourselves.¹⁹ This potential for feedback from others affecting perceptions of our own progress is even more critical considering the ways in which monitoring tools incorporate social media.

A recent report of the U.S. states approximately 80% of adults engage with at least one social networking site (SNS) and more than 50% engage in two or more.²⁰ While industry publications regularly publish survey data of who is using SNS, what sites

are used, why, and in what ways, less known are the motivations of individuals to use SNS and the effects of the engagement. Researchers²¹ applied social compensation theory—which suggests people with low self-esteem desire to enhance their image²²—to social media use and found that people who felt low self-esteem offline as compared to those with high self-esteem reported more active engagement with social networks sites. They also found that college students with low self-esteem as compared to those with high self-esteem shared more personal information on Facebook and had a greater desire to present themselves positively. Other researchers found that Facebook users with low self-esteem as compared to those with high self-esteem reported a greater desire to “friend” others on Facebook as part of self-enhancement efforts to appear more likeable.²³ Another study analysing people with weight-loss goals found that engagement with Twitter was perceived as positively related to weight loss, with participants mainly using Twitter to provide informational support to one another through status updates and responses.²⁴

This survey study employs the framework of the Transtheoretical Model (TTM) to explore the effects of fitness tools that allow health goals to be set, tracked, and shared with others. This study considers whether changes in behaviour from both goal-setting and desires to engage socially through SNS may have greater effects for furthering commitment toward monitoring health-related progress as compared to either factor alone. These survey measures include decisional balance queries (i.e., assessing attitudes of the pros and cons toward health behaviours before using a monitoring tool) and perceptions of self-health before initiating change. An online survey was developed with three research aims: (1) to determine how engaging in health monitoring affects an individual’s fitness behaviours; (2) to consider how using fitness tracking tools may influence others; and (3) to explore if social media sharing of fitness monitoring results impacts engagement with fitness monitoring. The following hypotheses are proposed:

Research Aim I: The Effects of Monitoring on Health Behaviours

H_{1a}: Time of engagement with monitoring is positively associated with meeting fitness goals.

H_{1b}: Time of engagement with monitoring to track calories is positively associated with adjusting calorie consumptions.

H_{3a}: Previous health status is negatively associated with the perception of the monitor’s contribution on improving fitness.

H_{3b}: Previous health status is negatively associated with the perception of the monitor’s contribution in helping weight control.

H_{4a}: Goal setting is positively associated with the perception of the monitor’s contribution on improving fitness.

H_{4b}: Goal setting is positively associated with the perception of the monitor’s contribution for weight control.

Research Aim II: The Impact of Monitoring on Others

H_{2b}: Time of engagement with monitoring is positively associated with the perceived effects of the individual’s weight control monitoring on others in their lives.

H_{2a}: Time of engagement with monitoring is positively associated with the perceived effects of the individual’s fitness monitoring on others in their lives.

H_{5a}: The perceived effect of health monitoring on other people’s life is positively associated with the perception of the monitor’s contribution on improving fitness.

H_{5b}: The perceived effect of health monitoring on other people’s life is positively associated with the perception of the monitor’s contribution for weight control.

Research Aim III: The Possible Benefits of Social Media Sharing

H_{6a}: The frequency of sharing results on social media is positively associated with the perception of the monitor’s contribution on improving fitness.

H_{6b}: The frequency of sharing results on social media is positively associated with the perception of the monitor’s contribution in helping weight control.

METHOD

This survey study employed the framework of the Transtheoretical Model (TTM) to explore the effects of fitness tools that allow health goals to be set, tracked, and shared with others. Thus, this study attempts to analyse why individuals choose to monitor fitness and weight control, and whether goal-setting is a critical component in the desire to track results. Similar to other studies, this study focused on behaviours directly related to the three latter stages of TTM. This study considers whether changes in behaviour from both goal-setting and desires to engage socially through SNS may have greater effects for furthering commitment toward monitoring health-related progress than either factor alone. These survey measures include decisional balance queries (i.e., assessing attitudes of the pros and cons toward health behaviours before using a monitoring tool) and perceptions of self-health before initiating change.

Designed as an exploratory study in developing a follow-up experimental study, participants were recruited specifically to target users of fitness monitoring; thus, convenience sampling and snowball methods were used to acquire respondents through student research pools and social networking sites. To boost respondent numbers Amazon Mechanical Turk (MTurk) was also employed. Online questionnaires explaining the purpose of the study and obtaining voluntary consent were distributed via these channels. Procedures were followed in compliance with approved Institutional Review Board procedures, including methods to ensure confidentiality. A total of 214 respondents clicked the link to participate. From the total participants, 165 gave consent and answered “yes” to the filter question. From these, 137 respondents completed the questionnaire. The questionnaire was created using Qualtrics (see Appendix). Data were collected September 14, 2015, through October 21, 2015. All statistical analyses were conducted using SPSS.

Independent Variables. Table 1 provides a summary of the questions and responses sets for the independent variables. In sum, the time of engagement with monitoring was measured by asking participants to indicate the length of time engaged

with using a monitoring tool (see Table 1). The previous health status was measured by an item asking participants to indicate their overall health before using a fitness monitor (see Table 1). The motivation of setting goals was measured by two items relating to fitness and weight respectively (see Table 1). For fitness, the participants were asked to answer “How often do you set goals related to your fitness performance?” and for weight, participants were asked to answer *yes* or *no* to the question “Do you have goals related to adjusting your weight?” The perceived effect on others was measured by asking, “Please rate how likely you think getting a fitness monitor has affected other people in your life.” The sharing frequency was measured by asking participants “How often do you share your monitor results with others through social network sites whether directly from the device or by making comments or posting visuals of results?”

Dependent Variables. Time of engagement with the monitor was measured by a series of items using 5-Likert-point scales examining the frequency that participants enter their fitness goals into tracking tools, the frequency participants make sure they meet goals, the frequency they use monitoring to track their calories, and the degree to which they have adjusted their calorie consumption based on tracking results. For each section, participants could indicate that their device did not have that particular feature, and survey logic skipped questions of features for which participants indicated no engagement. The perception of the health monitor’s effectiveness was measured by asking participants to rate the degree they felt monitoring contributed toward goals with responses measured on 5-point Likert scales.

RESULTS

Among the 137 participants in the final sample, 31 (22.6%) were male, 106 (77.4%) were female. The age category ranged from 18 to 55, with those indicating the age range of 18-20 forming the majority ($n = 76$, 62.8%). The ethnicity sample consisted of a majority of the participants as Caucasian ($n = 113$, 82.5%), and African American ($n = 9$, 6.65%), Hispanic ($n = 6$, 4.4%), Asian ($n = 6$, 4.4%) and other race ($n = 3$, 2.2%) representing the

Table 1. Distribution of Survey Responses

	Poor	OK	Fair	Good	Excellent
Please indicate your overall health BEFORE using your fitness monitor	2.2% (n = 3)	12.4% (n=17)	32.1% (n=44)	44.5% (n=61)	8.8% (n= 12)
	> 1 month	1-3 months	4-6 months	7-12 months	> 1 year
How long have you been using your fitness monitor?	7.3% (n=10)	31.4% (n=43)	26.35% (n =36)	11.7% (n= 16)	23.4% (n = 32)
	Never	Rarely	Sometimes	Often	Daily
How often do you set goals related to your performance?	1.5% (n=2)	9.5% (n= 13)	35.8% (n= 49)	38.7% (n=53)	14.6% (n= 20)
How often do you make sure you meet fitness goals on your monitor, even if it means finishing the progress when inconvenient?	3.0% (n= 4)	9.6% (n=13)	34.8% (n= 47)	40.0% (n = 54)	12.6% (n = 17)
How often do you share your monitor results with others through social network sites?	52.2% (n = 71)	18.4% (n= 25)	19% (n = 27)	7.7% (n = 11)	1.4% (n = 2)
	None	Very Little	Some	A Great Deal	Life-Changer
How much do you feel your fitness monitor contributes toward your fitness goals?	---	6.0% (n=8)	40.6% (n= 54)	47.4% (n = 63)	6.0% (n= 8)
How do you feel your fitness monitor has contributed toward your weight goals?	1.3% (n =1)	7.6% (n= 11)	50.6% (n=69)	34.2% (n= 47)	6.3% (n=8)
Please rate how you think getting a fitness monitor has affected other people in your life	4.55% (n= 5)	16.4% (n = 18)	42.7% (n = 47)	32.7% (n = 36)	3.6% (n = 4)

remaining 17.5% of the sample. The family income ranged from less than \$20,000 annually to \$150,000 annually. More than half indicated earning less than \$100,000 annually (53.8%).

Participants ($n = 136$) reported the time of using health monitors, health status, fitness goal-setting motivations, intentions to set weight control goals, and their tracking of calorie consumption. Of participants, 136 reported sharing frequency, and 135 reported their intentions to enter fitness goals and their efforts toward meeting fitness goal. Also, 133 reported their perceptions of the contributions of tracking for improving fitness. Despite these high response rates to initial questions, only 79 reported

their perceptions toward contributions of tracking for weight control. In the subsequent analysis, these 79 cases were used for hypotheses involving this variable; the complete data set ($n = 136$) was used for analysing hypotheses that did not involving weight control perceptions.

As Table 1 notes, descriptive data of the independent and dependent variables suggested that the majority of the participants perceived themselves to have had *good* ($n = 44, 32.1%$) or *fair* ($n = 61, 44.5%$) health before engaging in health monitoring. The majority of respondents reported having used a health tracking tool for *one to three months* ($n = 43, 31.4%$) or *four to six months* ($n = 36, 26.3%$). Most of

the participants reported engaging in setting fitness goals *sometimes* ($n = 49, 35.8\%$) or *often* ($n = 53, 38.7\%$), and the majority reported entering their fitness goals to the monitor ($n = 104, 77.5\%$). Participants also reported *sometimes* ($n = 47, 34.3\%$) or *often* ($n = 54, 39.4\%$) meeting the goals they enter into their monitoring tool. A dominant number of participants ($n = 117, 85.4\%$) reported perceiving that monitor tracking had *some to a great deal of* contribution toward achieving fitness goals. Regarding weight control usage, participants were more likely ($n = 79, 57.7\%$) than not ($n = 58, 42.3\%$) to report having a goal for weight control. The majority ($n = 88, 64.3\%$) reported using monitoring to track calorie consumption on an *occasional to daily* basis and indicated adjusting calorie consumption *some* ($n = 47, 34.3\%$), *a great deal* ($n = 36, 26.3\%$) or *completely modified* ($n = 4, 2.9\%$) accordingly. The majority reported that using a tracking device to meet weight control goals has made *some* ($n = 40, 50.6\%$) to *a great deal* ($n = 27, 34.2\%$) of difference. Participants also reported their inclinations to share their tracking results on social media with most reporting they would either *never* share ($n = 98, 71.5\%$) or *rarely* share ($n = 36, 26.3\%$) results.

H1a and H2a predicted the time of engagement with monitoring and the perceived effect of monitoring on others for predicting users' goals related to fitness purposes. To investigate these hypotheses, regression analyses were conducted. First, a logistic regression was conducted to examine the potential association of independent variables with users' practices of entering fitness goals. No significant association was detected. Then, a multiple regression was conducted to explore the relationship between independent variables and users' efforts on meeting fitness goals through monitoring. The behaviour of setting fitness goals was found to be a significant predictor ($\beta = .44, p < .01$). Therefore, only H2a was partially supported. H1a was rejected.

H1a and H2b predicted that the same sets of independent variables were significant predictors of users' engagement with health monitoring for weight control purposes. Because the motivation of setting weight control goals was measured by a categorical measure (yes/no), two independent T-tests were first

conducted to examine the relationship between goal setting and the two dependent variables, namely, using monitoring to track calories and adjusting calorie consumptions based on tracking. No significant association was detected. Then, two multiple regressions were conducted to examine the other four independent variables and the two dependent variables of weight control engagement. No significant associations were found. Therefore, H1a and H2b were rejected.

H3a – H6a investigated the potential contributions of the five independent variables in predicting users' perceptions regarding health monitor's contribution on improving fitness. Multiple regression analysis was conducted and two factors, the perceived effect of using monitors on others ($\beta = .24, p < .001$) and goal-setting practices ($\beta = .37, p < .001$) were found to be significant predictors. Therefore, H3a and H6a were rejected. H4a and H5a were supported.

Similarly, H3b – H6b explored if the five independent variables predicted the users' perceptions of health monitor's contribution on helping weight control practices. The result of multiple regression test suggested that only the perceived effects of using monitors on other people's lives was a significant predictor ($\beta = .23, p < .05$). Therefore, H6b was supported; H3b, H4b, and H5b were rejected.

DISCUSSION

Overall, findings indicate that fitness trackers are perceived as much more useful in achieving goals for fitness rather than those for weight control, suggesting that fitness monitor use is initiated with fitness goals in mind, and weight loss is viewed as a subsequent result of those fitness gains, not as an effect of using the monitor in and of itself. Goal setting for fitness improvement was a significant predictor of effort for achieving improved fitness; however, goal setting in relationship to weight loss was not significantly associated with efforts to reduce calorie consumption. It is possible that users of fitness monitors are less interested in regulating their food or nutrition and are simply more motivated to exercise instead. Because many of the wearable

fitness trackers provide automated physical activity assessments but not caloric intake assessments, users of wearable trackers may not develop a strong association between their use of these items and dietary intake. However, there was a significant association between use of the monitor and perceived achievement of fitness and weight loss goals, indicating that users do see an overall connection between fitness and weight loss, whether or not the fitness monitor was directly involved in the latter.

Perceived health status prior to the use of the monitor had no significant relationship to perceived effectiveness of the monitor, suggesting that users who viewed themselves as both healthy and unhealthy at the start of use could see benefits or not. Further research is needed to better understand the effects of self-assessments of health on self-efficacy and the role of goals for encouraging the initiation and maintenance of health behaviours. Perhaps perception of the monitor's effects is more related to personality, achievement orientation, or some other variable. Interestingly, time of use had no effect on the perception of the monitor's contribution to either fitness improvements or weight loss, which suggests that one's desire to continue to use the monitor, or decision to terminate use, is based on other factors. A post-survey, open-ended response question querying respondents ($n = 13$) who indicated they no longer engaged in tracking behaviours suggests that forgetting to track behaviours, losing motivation, and becoming bored with tracking are potential reasons for terminating monitoring, not lack of seeing results. Additional studies considering the decision-making processes of participants before purchasing a tracking tool and why people discontinue tracking would be helpful in designing fitness programmes.

While the frequency of sharing results on social media was not significantly related to perception of improved fitness goals or weight loss, the perceived effects that individual use of a monitor had on others was significantly related to the user's perceptions of the positive contributions of the monitor achieving fitness goals, but not those for weight loss. The finding that social support systems

are influential in users' perceptions of their use of tracking tools as impacting others in their lives supports TTM's premises that environmental factors are important elements in behaviour change and maintenance. Perhaps more study in TTM's first three stages will provide insight into the cognitive and emotional processes of thinking about others when acquiring and using monitoring tools.

The lack of sharing results on social media for the majority of respondents is surprising given the increased focus of monitoring tools to tout these capabilities among their features and news reports to discuss the options.²⁶ More research is needed to understand if sharing results occurs more frequently in particular stages of change and to analyse the differences related to progression through the stage of those sharing results as compared to those who do not. Perhaps social media sharing has the potential to encourage continued health behaviours through developing a network of supportive and like-minded others. Studies should consider what factors, such as personality types and demographics, affect engagement with social media for health-related goal postings.

The fact that there was, yet again, no association between the fitness monitor and weight loss in perceptions of the effects the monitor's use had on salient others further supports the previous assertion that users of fitness trackers may have fitness improvements in mind when beginning use, and any corresponding weight loss is viewed, perhaps, as a result of those fitness improvements, not use of the tracker itself. Future research should seek to include participants before using monitoring to understand the progression through TTM's first three stages.

The role of goal-setting also needs more in-depth consideration. Whereas health tracking tools may allow goals to be set and monitored quite easily, the consideration of individual preferences needs to be included to more fully understand why some respondents may engage in goal setting while others do not. It is possible that some people perceive little value in setting goals yet still desire to record activities. Thus, goal-setting may not be a primary motivator for using monitoring tools, but people may still find great value in initiating and continuing

healthy behaviours related to tracking. Researchers have proposed that monitoring mediates the effects of behavioural changes for goal attainment and that moderation tests show recording results have larger effects for obtaining goals.²⁵ Perhaps intervention strategies within the precontemplation stage and ensuing stages focusing on demonstrating the importance of goal setting and tracking *jointly* may encourage more effective behavioural changes.

Other potential areas for future research and investigation include assessing whether the type of monitoring tool matters in changing behaviours. Because downloading mobile apps can be done in moments and often quite inexpensively as compared to purchasing a fitness monitoring device, it seems plausible that the latter indicates more initial commitment to behaviour change. Additionally, a separate device dedicated to tracking may be viewed as a greater commitment because of the increased awareness of its physical presence and the required effort to manually set up the features of the device. There may also be differences between users of fitness monitoring devices purchasing the item themselves as compared to being given one as an unexpected gift. The first could potentially indicate that the user transitioned through the first two stages of TTM with more consideration of the pros and cons of change (i.e., decisional balance); whereas, the latter may lack the process of contemplating.

PRACTICAL APPLICATION

In general, it appears that fitness monitors are more strongly associated with fitness improvements than with calorie consumption and weight loss. Therefore, it may be necessary for health programme coordinators to emphasise the connection between all three when offering motivation for continued use of the monitor. Additionally, it may be more beneficial to use an app that allows users to track both fitness and dietary intake on the same platform, rather than a wearable device that will automatically track such behaviours as steps taken which does not intuitively connect physical activity to calorie consumption to weight loss.

Because it was found that boredom or reduced

motivation were potential causes for stopping use, monitoring tools that offer frequently updated fitness challenges, such as new courses to run, or meal planning, may prompt continued engagement with monitoring and subsequent healthy behaviours. Fitness mentors should consider establishing regular check-ins with their clients, sending reminders or even creating their own challenges using the monitor.

Although using social media was not shown to be significant for using monitoring tools toward improving fitness or weight, the involvement of and effects upon salient others did have a significant relationship to perceived effects of the monitor on fitness goals. Health programmes could emphasise the benefits of becoming healthier to live longer and fuller lives with family members and loved ones to encourage the connection between an individual's improved fitness and positive effects on those he or she cares about.

CONCLUSION

Fitness trackers have great potential for allowing people to monitor their fitness and health related goals, although much more study is needed to fully understand why and how they are used, and for what specific purposes. One of the important contributions to the study was how participants consider their tracking use as affecting others in their lives. This is a promising area for developing health strategies related to perceptions of how obtaining healthier levels improves the lives of others in our lives. This study provides a necessary first step toward understanding the effects of health tracking tools on individual behaviour change and the potential role of social media and social relationships toward changes.

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