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Use of text messages to increase positive affect and promote physical activity in patients with heart disease:

The Promoting Activity in Cardiac Patients via Text Messages (PACT) pilot study

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Abstract

Adherence to physical activity in patients with serious heart disease is critical to recovery and survival. In-person programs to promote activity in cardiac patients have been poorly attended, and increasingly patients are focused on mobile, self-management-based approaches to health.

Accordingly, we completed a one-arm trial of a novel one-way 14-day text message intervention among 40 patients with a prior acute coronary syndrome (ACS). The two-pronged psychological-behavioral intervention alternated daily messages focused on promoting psychological well-being with messages providing specific education/advice regarding physical activity. All messages were successfully transmitted, and nearly all participants found the intervention to be helpful ($n=37$; 92.5%) and performed at least one specific health-related action in response to a text message ($n=35$; 87.5%). Post-intervention, participants had improvements in happiness (Cohen's $d=0.25$), determination ($d=0.37$), depression ($d=-0.01$), and anxiety ($d=-0.13$), though not optimism. Moreover, participants reported an increase in moderate physical activity of 105 minutes/week (baseline: 261 [SD 265] minutes/week, follow-up: 366 [SD 519]; $d=0.25$). These improvements were largely maintained two weeks later, with further increases in physical activity (414 [SD 570] minutes/week). Text messaging focused on well-being and physical activity was well-accepted and associated with improvements in activity and mental health in this high-risk clinical population.

Keywords

positive psychology; text message intervention; mHealth; heart disease; physical activity; well-being

Physical activity plays a major role in recovery and survival following major cardiac events, such as an acute coronary syndrome (ACS, defined as myocardial infarction or unstable angina). Every year, over 1.3 million Americans suffer an ACS (Roger et al. 2011), and up to 20% will be rehospitalized for heart disease or die within the next year (Yeo et al. 2012). Increasing physical activity following an ACS is independently associated with fewer

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recurrent events and lower mortality (Chow et al. 2010; Gehi et al. 2007), but most post-ACS patients are not able to increase their activity to recommended levels (Chow et al. 2010; Sud et al. 2005; Roger et al. 2011). In prior work, key barriers to increasing activity in this population have included having low mood and low motivation to exercise, as well as lacking knowledge regarding exercise (Rogerson et al., 2012), suggesting that programs targeting mood, motivation, and education about activity may be important.

Existing programs to promote activity and other health behaviors in post-ACS patients, such as cardiac rehabilitation, can be effective in promoting activity and overall recovery. However, only a minority of patients attend these intensive in-person programs (Suaya et al. 2007) due to logistical barriers (e.g., time, work, or transportation) and because patients believe that they can independently manage their own health behaviors (Grace et al. 2009). These factors argue for the development of novel and effective tools to promote a self-management approach to achieve health behavior goals in cardiac patients.

Mobile health (mHealth) interventions—delivered via mobile, wireless devices—are emerging as promising tools to support health behavior change and maintenance. Currently, 95% of American adults (including 97% of 50-64 year olds) own a cellular phone and 77% own smartphones (cellular phones that have a mobile operating system capable of running downloaded applications and an integrated broadband cellular network connection for communication) (Pew Research Center 2017). Furthermore, half of smartphone owners have downloaded at least one mobile application ('app') related to health (Krebs and Duncan 2015), suggesting that people are eager to utilize these devices to manage their health. mHealth interventions allow patients to receive intervention content delivered to them anytime, in any location, with minimal burden on patients or providers.

Among mHealth interventions, text message interventions (TMIs) may be particularly appealing. Compared to downloading and interfacing with mobile apps, which can be both more time-consuming and more complex, TMIs are exceedingly simple and represent minimal burden for patients. Furthermore, even less technologically savvy cell phone users often can receive text messages, making such interventions potentially applicable to a very broad population of patients. Given that a key issue in health behavior promotion is maintenance of effects, TMIs may have a particular advantage over applications in that they are passively received rather than requiring regular active work on the behalf of patients to access content. TMIs have been successfully used in health promotion (Hall et al. 2015), including several studies in patients with heart disease that have found generally positive effects on health behaviors and cardiac outcomes, including reductions in smoking, increases in physical activity, and reductions in cholesterol and blood pressure (Chow et al. 2015; Pfaeffli Dale et al. 2015).

One promising application of TMIs for health is the use of messaging focused on positive psychological well-being. Positive psychological constructs, such as optimism and positive affect, are prospectively associated with more physical activity and lower rates of heart disease and mortality (Steptoe et al. 2006). Furthermore, positive psychology (PP) interventions, which utilize short tasks that focus on gratitude, altruism, personal strengths, and related constructs (Seligman et al. 2005), have been effective at improving well-being in

post-ACS patients (Huffman et al. 2016b) and used to target physical activity in this population (Huffman et al. 2017). The short, simple messages and tasks utilized in PP interventions may be well-suited to the brief messaging used in TMIs.

There are still numerous gaps in the use of TMIs in patients with heart disease. First, though there have been studies of TMIs in patients with heart disease (Chow et al. 2015; Hall et al. 2015), there has been minimal study of TMIs specifically in post-ACS patients, despite the high prevalence of this life-threatening condition and the critical need for post-ACS patients to make numerous health behavior changes. Second, there had been no study of TMIs to promote psychological well-being in patients with medical illness, despite the fact that PP interventions may be an excellent fit for this modality and this cardiac population.

Finally, prior work had not examined a combined TMI designed to both promote psychological well-being and provide specific education/support for physical activity. This may be a promising approach, as combined psychological and health education interventions may have greater effects on physical activity than either intervention alone (Safren et al. 2012; Katon et al. 2010). To address the ongoing need to promote activity in post-ACS patients and these persistent gaps in knowledge, we developed a combined PP- and physical-activity-focused, automated TMI for post-ACS patients, and examined the feasibility, acceptability, and initial impact of this 14-day intervention in a prospective one-arm pilot intervention trial. We hypothesized that more than 90% of text messages would be delivered, that more than three-quarters of patients would find the intervention useful, and that we would see small-medium effect size improvements on psychological outcomes by the end of the program.

Methods

The Promoting Activity in Cardiac Patients via Text messages (PACT) study was a one-arm pilot study of a text-message based program in ACS patients designed to promote well-being and physical activity. The primary goals of this initial study were to assess feasibility of text message delivery and acceptability of the program to post-ACS patients. A secondary goal was to assess the impact of the intervention on psychological well-being and physical activity at the end of the intervention and 2 weeks later. Institutional review board (IRB) approval was obtained prior to study procedures and all participants provided informed consent.

Participants

Patients previously hospitalized for an ACS, confirmed via chart review using criteria for myocardial infarction or unstable angina used in prior studies (Huffman et al. 2014; Thygesen et al. 2012), were contacted for participation via phone. Such patients had previously been hospitalized for an ACS at our academic medical center and had been discharged home; they were identified via chart review and as noted their ACS diagnosis was confirmed by applying structured criteria. Patients were assessed for eligibility and excluded if they: (1) had cognitive impairment, assessed via a six-item screen (Callahan et al. 2002), (2) were unable to participate in physical activity, (3) were not fluent in English,

or (4) did not have a mobile phone able to receive text messages or did not check their cellular phone at least daily.

Procedures

Following return of a written consent form by mail, participants completed baseline assessments of psychological and health behavior outcome measures with a study staff member by phone, and then initiated the text message program. The program contained 14 oneway text messages, delivered in an automated manner once daily; all participants received the same messages in the same order. The messages were delivered via the TextIt (TextIt server informational site) server and the Twilio (Twilio cloud communicating platform informational site) texting program; these functions are used through REDCap and Amazon Web Services, are HIPPA compliant, and have firewall protection and server encryption. Text messages were sent at a time requested by the participant between 8:00am and 6:00pm, with no personal information conveyed aside from a name or nickname entered by the participant. The messages were signed by the study team's research program with a line that read, "[name of hospital, redacted for review] Cardiac Psychiatry Research Program." Participants were informed that these were oneway messages and that the study team would not read or respond to return messages.

Following completion of the program, at 2 weeks, participants repeated quantitative self-report assessments and completed brief semi-structured interviews by phone to allow for detailed qualitative feedback about the program. The self-report measures were repeated at 4 weeks to assess longevity of changes.

Message content

The text messages (Table 1) alternated between those focused on PP-based content and those focused on physical activity. PP-based activities (Otake et al. 2006; Emmons and McCullough 2003; Seligman et al. 2005; Huffman et al. 2016b) included encouragement to recall and record three positive life events, to express gratitude to another person for a kind act, and to recall a past life success and how the participant contributed to that success. Activity messages provided education (e.g., American Heart Association recommendations about the health benefits of walking) and specific activity encouragement (e.g., scheduling exercise time, parking farther away in parking lots, taking breaks from sitting) based on recommendations from the American Heart Association, American Diabetes Association, and related organizations.

Study outcome measures

The primary study aims were feasibility and acceptability. Feasibility was assessed via rates of successful text message delivery as recorded by the automated system and confirmed by patient report. Acceptability was assessed via responses to specific queries at the 2-week post-intervention interviews regarding whether participants rated the program as useful or burdensome. During the interviews, participants also provided 1-5 Likert scale ratings on their perceived utility of specific message types related to both current and potential future content. This included messages about dietary modification, exercise, medication adherence, gratitude, stress reduction, general cardiac health information, and motivation/optimism.

Additionally, participants were asked their ideal frequency of receiving text messages (daily, more often, less often) and their ideal duration of such a program (days, weeks, months, or years). Finally, to assess the impact of the text messages on behavior, participants were asked whether one or more text messages led to a specific action related to a PP activity or physical activity.

The secondary study aim examined pre-post impact on self-reported psychological and physical activity measures. Psychological well-being was assessed via 0-10 Likert scales for positive (happiness, optimism, determination) and negative (depression, anxiety) psychological factors. Self-reported moderate (or greater) physical activity in minutes/week was assessed using a structured, validated two-item measure that inquired about the performance and duration of moderate intensity physical activity (Coleman et al. 2012), specifically asking 1) “On average, how many days per week do you engage in moderate to strenuous exercise (like a brisk walk)?” and 2) “On average, how many minutes do you engage in exercise at this level?” Response choices for days were categorical (0–7), with minutes recorded in blocks of 10. These questions were asked at baseline, week 2 (immediately following the two weeks of messages), and week 4.

Statistical analysis

Descriptive statistics (means, proportions, standard deviations) were used for baseline participant characteristics, feasibility data, and acceptability outcomes. Paired t tests were used to analyze pre-post differences in study outcome measures; given the small sample size, statistically significant ($p < .05$) changes were not expected, and effect size estimates (Cohen's d) were also calculated. All statistical analyses were performed via Stata 14.2 (College Station, TX), and all tests were two-tailed.

Results

In total, 102 ACS patients were approached, 60 were eligible and expressed interest, and 40 participants returned the written consent form and initiated the text message program (see CONSORT diagram, Figure 1). Participants (Table 2) had a mean age of 63.8 (SD 10.2) years, and were predominantly men (76%).

Regarding feasibility and acceptability, 100% of all text messages (N=560) were successfully received by participants. At the post-intervention interviews, 37 (92.5%) felt the program was helpful, and 35 (87.5%) reported having performed at least one specific action (well-being activity or physical activity) in response to a text message. Regarding topics for future TMIs (see Table 3), participants rated physical activity messages as having the highest utility (mean score 4.45 out of 5). Participants also rated diet-related messages (4.05), general cardiac health education information (4.00), stress reduction messages (3.90) and PP messages (3.67) as moderately high in expected utility. Medication reminders (2.60) were rated lowest.

When asked about ideal frequency of messages, 33 (82.5%) of participants stated they preferred daily messages, while four (10%) said they would like messages less often and three (7.5%) stated they would like messages more frequently than once a day. In terms of

the ideal duration of such a program, 18 (45%) of participants stated they would prefer a program on the order of “months” long, whereas 11 (27.5%) stated they would prefer a “weeks” long program and 11 (27.5%) said they would prefer a “years” long—or greater—duration of such a program (i.e., they would prefer to continue to receive messages indefinitely).

On the open-ended portion of these interviews (Table 4), at 2 weeks, several participants reported substantial benefit from feeling connected to a health promotion program and from having a sense that ‘someone was paying attention.’ Many participants also appreciated reinforcement of their personal strengths and qualities, liked the consistent focus on health and self-care, and found the modality non-intrusive and useful. In contrast, other participants felt that the one-way messages provided insufficient connection to the team or program, some found the messages trivial or insufficient to prompt change, and occasional participants reported that some activities (e.g., those requiring social contact) felt too burdensome. Participants also emphasized that they would prefer messages tailored to their personal health goals and preferences regarding the type (PP-based vs. health education) and nature (e.g., general education vs. a specific prompt to complete an activity) of messages.

Regarding initial impact, participants had pre/post improvements on all psychological measures (Table 5), aside from optimism, with small-to-medium effect size changes in happiness, determination, and anxiety (Cohen's $d=.13-.37$). Participants also reported an increase in moderate physical activity of approximately two hours per week (baseline: 261 [SD 265] mins/week, 2 weeks: 366 [SD 519] mins/week; $p=.15$; Cohen's $d=.25$), though this change was not statistically significant.

At 4-week follow-up (Table 4), two weeks after the final text message, the effect size of physical activity improvement further increased (to Cohen's $d=.40$), in accordance with a further increase in reported physical activity (mean 414 [SD 570] minutes per week) compared to baseline and 2 weeks. Improvement from baseline on psychological constructs was largely sustained at 4 weeks, with magnitude of effect similar to 2-week data amongst psychological constructs, aside from a modest drop in improvement in happiness (Cohen's $d=0.17$ at 2 weeks; 0.09 at 4 weeks) and a small increase in depression ($d=.14$); see Table 4.

Discussion

In summary, the PACT pilot study found that a simple, brief automated one-way TMI to promote well-being and physical activity could be successfully implemented in post-ACS patients, with complete transmission of messages, high rates of participant satisfaction, and promising improvements in several psychological/behavioral outcomes important to prognosis. This low-cost intervention was delivered with low burden to participants (who received a single daily text message) and the intervention team (who simply set the automated program in motion). Though not powered to detect statistical significance, the most significant long-term changes were demonstrated in physical activity and determination, which had medium effect size increases that persisted 4 weeks after the beginning of the intervention.

The feasibility and potential success of this program is consistent with the growing literature on the utility and acceptability of TMIs and other mHealth related interventions in patients with heart disease (Versluis et al. 2016; Chow et al. 2015). Prior TMI studies have found substantial improvements in health behaviors and health outcomes (e.g., blood pressure) in cardiac patients (Chow et al. 2015), while other studies have had mixed results (Pfaeffli Dale et al. 2015; Maddison et al. 2015; Anand et al. 2016). For example, a mobile cardiac rehabilitation program was linked to improvements in a composite health outcome measure at 3 months, but such effects waned by 6 months (Pfaeffli Dale et al. 2015), while a digital health intervention using text messages and emails in South Asians was not associated with a reduction in cardiac risk score after 12 months (Anand et al. 2016). A recent systematic review synthesized 15 prior reviews or meta-analyses that examined the use of TMIs for health promotion (Hall et al. 2015). Across these reviews, the authors found that 11 out of 19 studies examining TMIs for physical activity reported statistically significant effects on outcomes and/or behaviors, whereas the remaining 8 did not find significant effects. Likewise, there were also six individual TMI studies focused on weight loss, with five out of six reporting statistically significant effects on health outcomes and/or behaviors. This prior work led to the development of the proposed intervention by reinforcing the idea that simple TMIs can have effects on health outcomes but that the specific nature and content of the TMI appeared to be important.

Our program extends this literature by using a novel, two-pronged psychological-behavioral program that could be more effective than focusing on psychological or physical health alone. The intervention is also, to our knowledge, the first TMI in a medical population that leverages the potential benefits of activities to promote psychological well-being. Furthermore, this was the first study to specifically focus on post-ACS patients, a high-risk, high-yield population for whom mental health and physical activity are vital for optimal recovery and prognosis (O'Gara et al. 2013; Lichtman et al. 2014; DuBois et al. 2015), and a group for whom well-being has been prospectively linked to improvements in health behaviors (Ronaldson et al. 2015; Huffman et al. 2016a). The high rates of feasibility and acceptability among this older adult cohort was particularly encouraging, given past concerns that older adults may be less capable of—or amenable to—receiving mHealth interventions (Levine et al. 2016).

Feedback from participants suggested that additional personalized tailoring of messages would be of substantial benefit. Prior studies of mHealth interventions have found that a sense of an individual and personal connection is important to participants (Douglas and Free 2013; Naughton et al. 2013), and that interventions that tailor messages to individual participants are sought out by patients (Hoeppner et al. 2017) and have been more effective (Head et al. 2013). Furthermore, traditionally delivered health behavior interventions have likewise found tailoring to improve the effectiveness of such interventions (Noar et al. 2007). TMIs in post-ACS patients that utilize baseline characteristics or patient-stated preferences to tailor messages—or that could dynamically tailor messages based on feedback—may have greater effects than those seen in this study. This tailored approach may further boost the durability of the intervention—after the novelty of the intervention wears off—by ensuring that the TMIs have specific utility for the recipient.

While this intervention was two weeks in duration, more than three-quarters of participants stated they would prefer an intervention that was at least several months long. Additionally, more than four-fifths of patients said they preferred receiving a message on a daily basis. Future studies should evaluate the merits of varying lengths and frequencies of text messages in an intervention, and this is another feature that could be customized to patients on an individual level.

This initial pilot study had several limitations, including inclusion of a predominantly White, male cohort enrolled from a single site, a short-term intervention and assessment period, lack of knowledge about baseline cell phone use, and the single-arm nature of this initial study. This initial study was not powered to detect significant changes in study outcomes, and larger and controlled studies of refined TMIs will be needed to assess efficacy. In particular, the short-term nature of the intervention is a key limiting feature, given that health behavior change has health benefits when initiated and sustained over long periods and it is not yet known whether this program will be feasible or linked to behavior change over longer periods.

A simple automated TMI in post-ACS patients was feasible, well-accepted, and had promising and durable effects on psychological and behavioral outcomes in this initial pilot study. Future studies could use a more adaptive or tailored mHealth approach, and they should involve a longer intervention, longer follow-up assessments, and objective health outcomes in controlled trials. A more adaptive approach could allow participants to target specific behaviors (e.g., walking, biking) in a more personalized manner, and may also allow participants to receive specific kinds of messages (e.g., well-being-focused vs. educational) that are most appealing; all of this may improve both acceptability in the long-term and overall impact. Furthermore, longer interventions have the potential to assist patients in making initial health behavior changes into habits that are sustained over time. Ultimately, such a program could have a broad public health impact, given the low intervention cost/burden and the great need for programs to improve mental health and health behaviors in patients with recent major cardiac events.

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Fig. 1. Study flow diagram¹

¹Created in Microsoft Powerpoint

Table 1
Text Messages Delivered to PACT Participants

<p>Week 1:</p> <ul style="list-style-type: none"> • Hi [Participant Name]! Walking for even an additional 15 minutes per day can improve health and well-being. Try to take a walk today, alone or with a friend! • Hi [Participant Name]! Time for a happiness exercise! Stop for a few minutes and write down 3 separate good things that happened to you today or yesterday. • Hi [Participant Name]! Use easy tricks to increase your activity: park farther away in a parking lot and take the stairs today whenever you can! • Hi [Participant Name]! Take an opportunity to do a kind act (huge or tiny) for someone today, and then notice how you feel when you do it! • Hi [Participant Name]! The American Heart Association says that walking is one of the most effective forms of exercise to achieve heart health, so walk whenever you can. Take one today! • Hi [Participant Name]! Take a few minutes to express thanks (by phone or in person) to someone who has done something kind for you (today or years ago!). • Hi [Participant Name]! People who schedule exercise time on their calendar and treat it as any other important appointment are much more likely to stay active (and feel great!). Can you schedule a time to exercise (even a short walk) today? <p>Week 2:</p> <ul style="list-style-type: none"> • Hi [Participant Name]! Time for a happiness exercise! Think in detail about a successful event in your life today (small or large) and how you contributed to that success. • Hi [Participant Name]! Another simple way to improve your health is to take breaks from sitting. Today, anytime you've been sitting for an hour, get up and move for 10 minutes! • Hi [Participant Name]! At the end of the day today, think of a rose (a positive event from today) and a bud (something you are looking forward to). Ask the same of a friend! • Hi [Participant Name]! When it comes to activity, every little bit counts. How can you take a few extra steps today? Feel good that it will benefit your health! • Hi [Participant Name]! Research shows that having support for being physically active makes a big difference in achieving one's goals. Tell a friend or family member today about your exercise goals! • Hi [Participant Name]! Take the time to stop and appreciate something today—a friend, a beautiful view, or another person's kind act. • Hi [Participant Name]! Thank you for participating in our text message project! This is your last message. Think of a simple plan to be more active that you can commit to for the next week (like a 20 minute walk each night). Write it down now, and see if you can follow it for the next 7 days.

Table 2
Baseline characteristics of participants

Characteristic	Total (N=40)
<i>Sociodemographic characteristics</i>	
Age; mean (SD)	63.4 (9.7)
Male sex	31 (75.6)
White race	38 (92.7)
Married	31 (75.6)
<i>Medical history</i>	
Hypertension	34 (85)
Hyperlipidemia	37 (93)
Type 2 diabetes	3 (8)
History of smoking	19 (48)
<i>Baseline self-report outcome measures (measure; range); all listed as mean (SD)</i>	
Physical function (DASI; 0-58.2)	46.9 (12.5)
Moderate physical activity (minutes/week)	261.5 (265.0)
Self-reported Health (1-5 Likert scale)	2.0 (0.9)

DASI=Duke Activity Status Index; All variables are presented as *n* (%) unless specified.

Table 3
Participant ratings of the utility of text message content areas

Content Area	Mean Rating (1-5 Likert Scale)
Health Behavior Messaging	
Physical Activity	4.45 (SD 1.30)
Dietary Adherence	4.05 (SD 1.32)
General Cardiac Health Education	4.00 (SD 1.20)
Medication Adherence	2.60 (SD 1.93)
Positive Psychological Messaging	
Gratitude	3.67 (SD 1.54)
Stress Reduction	3.90 (SD 1.37)
Motivational/optimism	3.53 (SD 1.62)

Table 4
Themes from post-intervention interviews with participant quotes

Themes from positive feedback regarding the PACT intervention	
<u>Connectedness:</u>	<ul style="list-style-type: none"> • “Someone else out there is thinking about me and whether I get off my duff.” • “It’s like company, like someone talking to you.” • “You look forward to it, especially living alone and having to cope with diabetes and heart disease”
<u>Well-being:</u>	<ul style="list-style-type: none"> • “The messages communicated, ‘hey! Remember how great you are.’” • “Setting yourself in a positive frame of mind is huge.”
<u>Focus on health:</u>	<ul style="list-style-type: none"> • “Cuts through all the noise...reminds you that you need to take care of yourself.” • “The very first message asked if I could get an extra 15 minutes of walking. I decided to add 15 minutes to my 45 minute treadmill walk for the rest of my life.” • “I started taking quick strolls to break up my day.”
<u>Modality:</u>	<ul style="list-style-type: none"> • “A seed was planted for the rest of the day and week...then later I would do some of those healthy or good things.” • “It’s a good program because people live off their smartphones.” • “Would be good to go on forever... the messages never hurt.” • “Reinforces immediate importance of doing healthy or good things.”
Themes from constructive feedback	
<u>Connectedness (lack of):</u>	<ul style="list-style-type: none"> • “I was not motivated to complete [activities] because there was nobody over me checking to do that.” • “Might be better to have messages come from a specific person, like your physician so that there is a personal connection.”
<u>Quality and impact of messages:</u>	<ul style="list-style-type: none"> • “A lot of it was trivial.” • “Some were too touchy-feely.” • “I smiled and I liked it– but nothing changed...it didn’t trigger anything new or different.” • “It would be nice if there was a way to set preferences and customize to each person.”
<u>Burden:</u>	<ul style="list-style-type: none"> • “Any [activity] that involved somebody else, like calling a friend was not convenient.”

Table 5
Pre-post changes in psychological and behavioral outcome assessments (2 weeks and 4 weeks)

Measure	Baseline mean (SD) n =40	2 week post-intervention mean (SD) n = 40	4 week post-intervention mean (SD) n = 36	2 week change (p value; effect size of change [d])	4 week change (p value; effect size of change [d])
Psychological constructs					
Happiness (0-10)	7.60 (2.04)	8.03 (1.37)	7.69 (1.51)	.43 (p=.12; d=.25)	.17 (p=.60; d=.09)
Determination (0-10)	7.75 (1.63)	8.30 (1.36)	8.39 (1.57)	.55 (p=.002; d=.37)	.61 (p=.01; d=.37)
Optimism (0-10)	7.85 (2.10)	7.78 (1.67)	7.83 (2.09)	-.08 (p=.79; d= -.04)	.06 (p=.85; d=.03)
Anxiety (0-10)	3.10 (2.63)	2.75 (2.56)	2.92 (2.49)	-.35 (p=.36; d= -.13)	-.28 (p=.49; d= -.10)
Depression (0-10)	1.63 (2.33)	1.60 (2.22)	1.85 (2.48)	-.03 (p=.91; d= -.01)	.23 (p=.41; d=.14)
Physical activity (min/week)					
Moderate activity	262 (265)	366 (519)	414 (570)	105 (p=.15; d=.25)	175 (p=.052; d=.40)