Original paper

Readiness for health behavior changes among low fitness men in a Finnish health promotion campaign

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Author's contribution

KSK analyzed the data and wrote the manuscript. JK, MM, KK and MP contributed to the study design, data collection and critical review of draft manuscripts. All the authors read and approved the final manuscript.

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Conflicts of interest

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Abstract

Men have been a hard-to-reach population in health behavior programs and it has been claimed that they are less interested in health issues than women. However, less is known about that how ready men are to adopt new health behaviors. This study examined readiness for change in physical activity (PA) and eating behavior (EB) among low fitness and overweight working-aged Finnish men who participated in a physical activity campaign. Associations between perceived health knowledge, health behaviors, psychosocial factors and readiness for change were studied. Data comprised 362 men aged 18-64. Physical fitness was assessed with a body fitness index (BFI) constructed on the basis of the Polar OwnIndex Test, a hand grip test and an Inbody 720 body composition analysis. Health behavior information was gathered by questionnaire. Descriptive and comparative analyses were conducted by chi square test and Kruskall-Wallis and Mann-Whitney U tests. Associations between health knowledge and health behaviors were explored with logistic regression analyses. Readiness to increase PA and change EB was positively related to higher scores in psychosocial factors, PA and healthy eating habits. Self-rated knowledge on health issues was not related to PA or readiness to change health behaviors; however, it was positively associated with healthy eating and greater perceived promoters of PA. Participants' self-rated knowledge reflected interest in health but also differences in age and education. Health programs are needed that target both PA and healthy eating in low-fit men at different ages and motivational stages.

Keywords: health behavior, health knowledge promotion, stages of change, men

Background

Discussion on the benefits of physical activity (PA) and a healthy diet has become increasingly prominent in recent decades, and health information has been disseminated among different population groups (Lee et al., 2012). Nevertheless, the prevalence of overweight working-aged men in the Nordic countries is as high as 70 percent (World Health Organisation, 2010). The primary reasons for overweight and poor physical fitness are sedentary lifestyle and unhealthy diet (Lee et al., 2012). In Finland, daily intake of fresh vegetables or fruit is reported by only one-third of Finnish working-age men (Helakorpi et al., 2011), and it is among the lowest for this population segment in Europe (OECD, 2013). Furthermore, one-third of Finnish men are

sedentary in their everyday lives (Husu et al., 2011). Despite that, only a few studies have found effective methods of supporting change in men's health behavior (George et al., 2012; Taylor et al., 2013).

Males, compared to females, have been represented as a hard-to-reach population in health behavior programs due to their lower propensity to seek health information and to engage in health promoting behaviors (George et al., 2012; King, 2013; Taylor et al., 2013). Notwithstanding, gender is often ignored in health programs and only a few campaigns have been explicitly targeted at men (Caperchione et al., 2012; George et al., 2012; Miles, 2001; Taylor et al., 2013). Recent studies propose that men tend not to be very receptive to general health information (King, 2013). While awareness on health behaviors may be promoted by mass media campaigns, these are not effective in increasing perceived personal risk or motivating long-term changes in health behavior (Morley, 2009). According to recent intervention studies, programs that include positive social support, use of self-monitoring tools and individual feedback have facilitated men's participation in programs (George et al., 2012; Short et al., 2014; Taylor et al., 2013). Among males, physical activity is an accepted way to promote health, but health is rarely the primary motive for exercise (Hagger et al., 2006; Pietilä, 2008). Stronger motives for engaging in PA are enjoyment and learning of new skills. In physical activity maintenance, enjoyment and the perceived benefits of PA (e.g. wellbeing, social aspects and health) outweigh the perceived barriers (Aaltonen et al., 2012).

It has been suggested that health counseling most benefits those who perceive a need for change and who are ready to adopt new health behaviors (Payne et al., 2004; Salmela et al., 2012). People often express the intention to increase PA, lose weight or eat healthily, but sustained changes are rarely achieved. Intention describes how hard individuals are willing to try to perform a behavior (Fishbein and Ajzen, 2011). However, behavioral change takes place within social systems, which set challenges to individual's aims to adopt healthier routines (van Woerkum and Bouwman, 2014). Health behavior theories, such as the Transtheorethical Model (TTM) (Prochaska and DiClemente, 1983), describe the process of health behavior changes and the different stages of motivational readiness for change (Prochaska and DiClemente, 1983). In the first stage the individual has not yet recognized a need for change and has no intention to change. The next motivational stage is contemplation, where the intention to change one's behavior is forming. In the third stage, change is being planned (preparation). Efforts towards action increase in the next motivational stages, which are termed action and maintenance. The process from the contemplation (intention) to maintenance (permanent habit) stage is a result of changes in motivation, self-efficacy and behavioral control (Fishbein and Ajzen, 2011; Prochaska and DiClemente, 1983). Self-efficacy is a personal belief in one's capacity to perform the desired behavior in the existing circumstances. Motivation predicts strength of

commitment to a behavioral change. Perception of the benefits of the target behavior and self-efficacy contribute to the adoption of the behavior (Armitage et al., 2004; Payne et al., 2004).

However, research has indicated that the differences between motivational and behavioral processes across the five stages of change are not sufficiently clear (Hagger, 2014; Schwarzer, 2008). Therefore, instead of dividing the process of change into five distinct stages, an increasing number of studies have focused on understanding the gap between the intention and action phases (Hagger, 2014; Rhodes and Nigg, 2011; Romain et al., 2014). The aim of this cross-sectional study was to explore the intention and action stages of change in PA and eating behaviors and the role in this process played by self-rated health knowledge and psychosocial factors among low-fit and overweight working-aged men who participated in a physical activity campaign. The study also explored the associations of age with readiness to change health behavior, physical activity, eating habits, psychosocial factors and health knowledge.

Methods

Setting and data collection

The data were collected in connection with a Finnish health campaign titled "The Adventures of Joe Finn" during September 2011. The campaign was launched in 2007 as a part of a national Fit for Life Program. The primary aim of the campaign was to encourage sedentary working-aged men to increase their PA and adopt a healthy lifestyle. A further aim was to build cross-sectoral collaboration within municipalities, improve PA counseling services for men and increase the publicity of men's health promotion in the national media. The tone of the campaign was fun- and adventure-based rather than health-focused (Malvela et al., 2011). The campaign targeted both men and health promotion professionals, and included three mobile road tours around Finland, a seminar tour for professionals, various local activities and community events (e.g. cooking courses, exercise classes for men), Joe Finn physical fitness tests, web-sites (www.suomimies.fi), communication channels in social media (blogs, Facebook) and printed materials for men. It was also hoped to disseminate knowledge of good practices arising out of the campaign that would lead to permanent actions on the local community level.

A central component of the Adventures of Joe Finn campaign is free fitness testing for men and personal feedback on the test results. The fitness testing took place in a lab installed in a truck (Heiskanen et al., 2012).

The truck was parked in market squares or in the petrol stations in city centers. Before the road tour, the fitness tests were advertised in newspapers, social media and public places (e.g. on notice boards in shops and streets). For this study, data were collected from 12 different towns and participants were recruited at the various mobile tour events where they participated in the Joe Finn fitness test. The inclusion criteria in the present study were male gender, age (18-64), participation in the fitness tests, returning the health behavior questionnaire, having either low body fitness or moderate fitness, and being overweight (Body mass index (BMI)>25 kg/m^2) and at risk for abdominal obesity (Visceral fat (VFA)>100 cm^2).

Participants

A total of 900 working-age men completed the health behavior questionnaire and the Joe Finn fitness tests during "The Adventures of Joe Finn" campaign in the year 2011. The questionnaires were delivered to the men prior to their participation in the fitness tests in order to reduce self-reporting bias. Of these 900 men, 362 (40 %) were eligible for participation in this study (low fitness or moderate fitness and risk for abdominal obesity). The majority of the participants (n=362) were employed (77 %), married or cohabiting (75 %) and had an intermediate (47 %) or high (36 %) level of education. One-fourth (22 %) reported one or more chronic diseases, 37 per cent were obese (BMI>30 kg/m2) and 38 per cent had low BFI (BFI<-1). Participation was voluntary and all participants gave their written consent. The study was approved by the ethical committee of the University of Jyväskylä.

Body fitness index

Physical fitness was assessed with the Joe Finn fitness test battery, which included hand grip (Saehan's dynamometer), the Polar OwnIndex Test (Polar Electro, Kempele, Finland) and an InBody 720 body composition analysis. The test results were used to compute a body fitness index (BFI) describing physical capacity and various health-related aspects of body fitness (Heiskanen et al., 2012; Kaasalainen et al., 2013). The BFI was calculated from five test variables: body fat (%), visceral fat area (VFA) (cm^2), maximal oxygen consumption (VO_2max) (ml/kg/min), skeletal muscle mass (SMM) (kg/m) and hand grip strength (kg/kg). VO_2max was assessed with the Polar OwnIndex Test, and body fat (%), VFA and SSM were measured with bioelectrical impedance (BIA) using an InBody 720 analyser. Each test result was compared with age-matched reference values and expressed as points. The BFI variables were weighted with the following multipliers:

VO_2max 0.50, Fat % 0.10, VFA 0.15, SMM 0.15 and hand grip 0.15. The equations used in calculating the BFI have been described in detail elsewhere (Kaasalainen et al., 2013). The BFI ranges from -5 to +5, where < -3= very poor, < -1 = poor, < +1= acceptable, < +3=good and > +3 =very good. Participants with BFI scores ≤ -1 were assigned to the low and BFI ≤ 1 to the moderate BFI category. Body mass index (BMI) was calculated (kg/m^2) by self-reported height and body weight. BMI >25 kg/m^2 was the criterion for overweight.

Eating habits

Eating habits were assessed in the questionnaire with twelve items (Table 1). For each item, the response alternatives were yes/no. Each item was scored 0 or 1 depending on the health aspect of the habit (e.g. "I eat fish at least 2 times/wk", yes=1 or "I have a frequent habit of snacking", no=1). The questions were based on previous research on nutrition and metabolic syndrome definers (Kuninkaanniemi et al., 2011). The final eating habits score was calculated as the sum of healthy choices. The score varied between 0 and 12, higher scores indicating a higher number of healthy eating choices. For statistical analysis the score was divided into three tertiles indicating quality of the diet: 1=low (0-6 points), 2=intermediate (7-8 points) and 3=high (9-12 points).

Physical activity

Participants self-evaluated their level of PA by answering three multiple-choice questions. The first question, designed to elicit the overall level of PA, was "Select the alternative that best describes the overall amount and intensity of your physical activity during the past three months". The PA categories were low= 0-1 hours (h)/ week (wk), moderate=1-3 h/wk, and high= over 3h/wk). This classification was constructed on the basis of the answers given on the Polar OwnIndex Test background form, where the respondents' descriptions of their PA level ranged from moderate to vigorous activities during leisure time or at work (Polar Electro, 2015). The second question concerned active commuting to work, which was assessed with self-reported frequency (0-5 times/week) and duration (categories from "not at all" to "60 or more minutes/day"). Frequency and duration were computed into one variable describing weekly commuting activity (1= 0-15min/wk, 2=30-120min/wk, 3= 150min or more/wk). The third question, on the frequency of strength training, was "How often do you engage in strength-enhancing PA in your leisure time?" Response alternatives ranged from 1=not at all to4 times or more/wk. Finally, for statistical analysis, a single categorical variable was computed from the answers to the three PA questions. Total scores ranged from 0 to 5, and were subsequently grouped to form three PA categories: 1= low PA (0-2 points), 2=moderate PA (3-4 points) and high PA (5 points). Five points were awarded if overall level of PA, commuting activity to work, or both types of PA combined,

exceeded 2h30min per week (3 points) and strength training was performed 2 or more times/wk (2 points). High PA was an indicator of meeting the PA recommendations (PA at least 2h30min/wk and gym training at least 2 times/wk) given in Haskell et al. (2007).

Readiness for change in eating behavior and physical activity

Readiness for change in eating behavior (EB) was elicited with the question "Have you changed your eating habits during the past year?" (1 = No, and I have no intention to change, 2= No, but I intend to change in the near future, 3 = I have tried to change, 4 = I have made some changes, and 5= I have made considerable changes". The items were adapted from the FIN-D2D basic questionnaire (The Finnish Diabetes Association, 2006). In the further analyses, the responses were classified into two stage-of-change categories: intention = stages 1-3 (precontemplation-preparation) and action= stages 4-5 (action/maintenance). The self-reported precontemplation stage was recoded into the action stage, if the respondent reported daily use of fruit and vegetables (F&V) and did not eat fast food several times weekly. The purpose was to prevent misclassification of healthy eaters in the intention stage.

Stage of change in PA was elicited with the question "Have you increased your level of physical activity during the past year?" Response alternatives were 1=no intention to change…5=permanently active and those were later assigned into two categories (1=intention and 2=action) as with the EB changes. Precontemplators of PA change were recoded as actors if they reached the PA recommendations (PA at least 2h30min/week and gym training at least 2 times/week).

Psychosocial factors

The scale measuring perceived barriers to PA (Cronbach's $\alpha = 0.67$) comprised 10 items (tiredness, lack of motivation, economic situation, work responsibilities, family reasons, health, lack of social support, lack of sport facilities, weather, safety). Factors promoting PA (Cronbach's $\alpha = 0.66$) were elicited with 8 items (nice environment, good sport facilities, feeling refreshed, health promotion, physical fitness, appearance, weight management, friends or exercise group). Respondents were asked to estimate on a 5-point Likert-scale to what extent certain factors hindered or promoted their engagement in physical activity. Alternatives were 1=very much, 2 =fairly much, 3=fairly little, 4=a little or not at all and 5=don't know. For statistical analysis, sum scores were computed for the promoting and hindering variables. The final scores showed values between 0 (don't know) and 4 (very much). Perceived promoters were recoded in reverse order, greater

values indicating a higher score, while for barriers a higher score indicates that barriers have less impact on the respondent's PA.

The health behavior questionnaire comprised 5 statements on physical activity self-efficacy (Cronbach's α = 0.80) adapted from PA coping and recovery self-efficacy scales (Schwarzer, 2008). The statements were "I am able to exercise when I am "tired"/ "bad tempered"/ "busy"/ "although the people close to me do not place a high value on physical activity" and "I am able to restart exercise after an inactive period" (Kaasalainen et al., 2013). Participants were asked to assess how well the statements matched their situation. The original response alternatives were given on a 5-point scale (1 = strongly agree, 2 = somewhat agree, 3 = somewhat disagree, 4 = strongly disagree 5 = don't know). For statistical analysis, the items were recoded in reverse order and computed as a sum score. The final score was the mean of the self-efficacy items, which varied between 0 and 4. A higher score indicated higher self-efficacy.

Health knowledge

Health knowledge was assessed by asking respondents to rate their general knowledge of the Finnish physical activity recommendations and the food plate model ("Do you know what is meant by the PA recommendations/food plate model?"). Response alternatives were 1="Yes, I know them/it well", 2= "I know something about them/it", 3= "I have heard about them/it, but don't remember" and 4 = "Don't know". For statistical analysis, alternatives 1 and 2 were categorized as having knowledge and 3 and 4 as not having knowledge of these health issue. PA guidelines for Finnish adults recommend at least 150 min moderate intensity or 75 min high intensity PA per week. Also recommended are strength and mobility enhancing exercises twice weekly (Husu et al., 2011). The food plate model is recommended for constructing a healthy meal. The model suggests that half of the food on the plate should consist of vegetables, fruits or berries, one quarter grains, potatoes or rice and one quarter fish, meat, poultry or other protein-rich food (Aro, 2005). The purpose was to evaluate participants' perceived awareness of the public health guidelines and whether knowledge of these guidelines is associated with their health behavior and stage of change.

Statistical analyses

Data were analyzed using IBM SPSS statistics for Windows 20.0. Basic descriptive data frequencies and cross-tabulation with chi square test were calculated for demographics (education, marital status, occupational status, age, BMI), physical activity (PA), eating habits, readiness to change EB and PA, weight loss intention

and self-rated weight. Because the study variables were categorical and non-normally distributed, the nonparametric Kruskall-Wallis, the Mann-Whitney U-tests and logistic regression analyses were used to evaluate differences in body composition, psychosocial factors, health behaviors and health knowledge between the age groups and stages of change. In logistic models, the mean values were used as cut-points for high and low perceived barriers, promoters and self-efficacy. The categorical variables were entered in logistic regression models that comprised perceived knowledge on physical activity guidelines and the foot plate model. Both models were adjusted (BMI, BFI, VFA, age and education). Results of nonparametric tests were expressed as means and standard deviations (SD) and logistic regression analyses as odds ratios (OR) and confidence intervals (95% CI). Missing responses on PA change (n=1) and EB change (n=17) were imputed with IBM SPSS statistics for Windows 20.0 multiple imputation. Educational status was not reported by 17 participants. These missing cases were coded as zero for statistical analysis.

Results

Age differences in body composition, health behaviors, stages of change, psychosocial factors and health knowledge.

Most of participants (n=362) had a realistic body image, as 85 per cent of men categorized themselves as overweight or obese. However, 36 per cent of the obese men rated themselves as overweight rather than obese. Altogether, 85 % of the men desired to lose weight, but only a few (14 %) reported having changed both their eating habits and physical activity during the past year. The middle-aged (aged 35-49) and the oldest (35-64- year-old) men were more often willing to lose weight than the men in the youngest (18-34 year-old) age group ($p=0.002$, $\chi^2= 12.06(2)$). On the basis of self-reported PA, about one-fifth of the men reached the recommendations for moderate to vigorous PA (Table 1). In all age groups, the majority of the men reported an intention to increase their level of physical activity. However, actual changes in health behaviors were rarely reported, and when they were, they more often concerned eating habits (34 %) than PA (23 %).

The youngest men (age 18-34) had the highest scores for PA self-efficacy, perceived PA promoters and the best knowledge about the food plate model (Table 1). The oldest men (50-64 years old) had the most visceral fat and highest score for healthy eating habits, although they were also the least aware of the food plate

model. Overall, 87 per cent of the men reported that they were knowledgeable about the PA recommendations and 80 per cent knowledgeable about the food plate model.

Differences in body composition, health behaviors and psychosocial factors by stage of physical activity change.

Results indicated that the action stage of PA change was positively related to younger age, higher scores for perceived self-efficacy, promoters and barriers to PA, healthier eating habits, and greater PA (Table 2). Those who reported change in PA were also more likely to have implemented change in EB (OR 3.80 95 % CI 2.21-6.61, $p<0.05$). Participants in the action stage of PA change were more likely than intenders to report exercising because it is refreshing and relaxing (1.99, 1.07-3.72 $p=0.031$). Actors were also more likely than intenders to report lack of motivation and work assignments as minor barriers to PA (3.39, 1.71-6.66, $p<0.001$). Furthermore, daily intake of F&V (2.69, 1.28-5.65, $p<0.05$), regular meal times (1.95, 1.06-3.59, $p<0.05$) and not having a habit of snacking between meals (2.68, 1.35-5.33, $p<0.05$) were more likely among the action stage (vs intention).

Differences in body composition, health behaviors and psychosocial factors by stages of eating behavior change.

Readiness for EB change was not related to body composition, but the respondents in the action stage scored higher on healthy eating habits (Table 2). Actors were more likely than intenders to self-report intake of low-fat cold cuts (1.97, 1.15-3.35, $p<0.05$), daily use of F&V (1.89, 1.04-3.43, $p<0.05$) and not having a habit of snacking (1.99, 1.13-3.47, $p<0.05$). Among actors, change in EB was also associated with high PA self-efficacy and low perceived barriers to PA. Compared to intenders, actors more often reported lack of motivation (2.49, 1.41-4.26, $p=0.001$) and family reasons (1.81, 1.03-3.18, $p=0.039$) as having little impact on their PA.

Health knowledge and health behaviors

Perceived knowledge on PA recommendations was not related to PA level or stage of change; however, it was positively associated with higher scores of PA promoters, healthy eating habits and higher education (Table 3). Knowledge about the food plate model was also positively associated with healthy eating, PA promoters and lower age.

Discussion

The study participants represented working-aged men with a need to improve their fitness or body composition. Most had intentions to change their health behaviors but the process was still in the early stages. Only 14 per cent of the men self-reported increases in PA and changes in EB during the past year. Over 80 per cent of participants reported good knowledge of the PA recommendations whereas self-evaluated knowledge of the food plate model varied more between the different age groups. The oldest men (aged 50-64) had the most visceral fat and highest score for healthy eating habits but also reported having the least knowledge about the food plate model. Age-related changes in body composition may increase older men's motivation to follow a healthy diet (Phillips and Prins, 2008), even if they were not as familiar with the food plate model as the younger men. On the other hand, the younger men may not have perceived themselves as vulnerable to overweight-related problems, as they reported less interest than the older men in weight loss. On the supposition that the men aged 18-35 were knowledgeable about how to construct a healthy meal, then they were not very strictly applying this knowledge in their daily lives.

As is known, the adoption and maintenance of a healthy diet is challenging and related to factors other than knowledge alone; for example, fast food eating is likely to be influenced by social factors, cravings and affects (Dunn et al., 2011). Healthy choices are connected with the adoption of routines, various social practices and the individual's personal capacity to induce social change (van Woerkum and Bouwman, 2014). Among Finnish men, low socioeconomic status has been related to lower PA in leisure time and unhealthy eating patterns (Helakorpi et al., 2011). In this study, age and education were associated with better self-rated knowledge of the food plate model and the PA recommendations. Furthermore, healthier eating habits and higher perceived promoters of PA were more likely among those who rated their knowledge on healthy eating and PA as good. In contrast, level of PA was not associated with self-rated knowledge. However, regular PA and healthy eating were related behaviors, although only a few of the overweight or unfit men had implemented both changes.

The men in this study reported more changes in EB than PA, despite previous findings that men consider PA a more acceptable way to promote health than modifications in nutrition (Caperchione et al., 2012; Pietilä, 2008). Pedersen and colleagues found that men tended to be more ready than women to increase their PA (Pedersen et al., 2009) and Pietilä (2008). Moreover, Caprechione et al. (2012) reported that men were less

interested than women in diet and health issues. However, in previous studies perceived need to improve health predicted healthy eating intention but less so the intention to exercise (Hagger et al., 2006; Payne et al., 2004). EB has shown a stronger association than PA with weight loss goals, and dietary changes have been associated with a more instant effect on weight than PA (Payne et al., 2004; Teixeira et al., 2012). Engagement in PA may require even more effort and greater motivation than changes in eating habits (Rhodes and de Bruijn, 2013). In this study, those who reported change in PA were more likely to perceive PA as an enjoyable activity whereas health, fitness or weight loss were not differentiated as promoters of PA. The gap between reported intentions to change and implemented behaviors may reflect the different nature of EB and PA or different ways of reporting these behaviors. Given that all the study participants were overweight and not very fit, changes in both diet and PA would be necessary. Therefore, it would be important to support the maintenance of healthy choices among these men who already have adopted some favorable changes.

Although the data were cross-sectional, and therefore disallow causal inferences, the results supported the TTM theory, which suggests that proceeding along the motivational stages of change is a result of increased self-efficacy and changes in decisional balance. It is well established that the relationship between intention and actual behavior is asymmetric (Rhodes and de Bruijn, 2013). Other psychosocial factors (e.g. self-efficacy and decisional balance) and habitual behaviors are also likely to explain this intention-behavior gap (de Bruijn and Rhodes, 2011; Rhodes and de Bruijn, 2013). The present study showed that self-efficacy was associated with both PA and EB change. Although healthy eating-related self-efficacy was not examined, greater PA-self-efficacy may also influence the confidence to make changes in EB. Recent studies suggest that men are becoming increasingly health conscious and motivated to adopt a healthy lifestyle, provided this can be done without loss of masculinity (Pietilä, 2008; Robertson et al., 2013). Furthermore, several studies have found that self-efficacy has an important role in behavioral change (Ayotte et al., 2010; Rhodes and Nigg, 2011). Engagement in PA calls for special effort, new skills and self-efficacy (Rhodes and de Bruijn, 2013; Teixeira et al., 2012). Robertson et al. (2013) noticed that increased self-efficacy was a prerequisite for successful health behavior changes among men who participated in a health behavior program conducted in a football setting (Robertson et al., 2013). However, interventions need careful targeting. Overweight and unfit men may have low self-efficacy and poor perceived PA skills (Kaasalainen et al., 2013). Given that good PA skills and physical fitness are valued among men, the inability to fulfill expected norms may induce fear of failure and decrease motivation for engagement in PA (Pietilä, 2008; Verdonk, 2010). In the present study, the men over age 35 had lower PA self-efficacy than the youngest men, which indicates that middle-aged men, in particular, may need encouragement to engage in PA.

The present results revealed that lack of perceived need to change may be a barrier to healthier eating among younger men, while older men may lack the skills and self-efficacy required to increase their PA. It was also found that the general barriers to increasing one's level of PA were related not only to motivation but also to social responsibilities in work and family life. These barriers should be considered when planning health promotion programs for men at different ages. The programs have to harmonize with the local culture and men's personal preferences. Hunt et al. (2013) and Robertson et al. (2013) identified a number of factors that facilitated men's engagement in a health promotion program in football clubs (Hunt et al., 2014; Robertson et al., 2013). They concluded that a social and physical environment where healthy choices can be conveniently made, without fear of behaving in a feminine manner, are predisposing factors for health behavior change. According to the authors, a familiar physical space and like-minded people help to create the right atmosphere, along with trust and motivation, for sustained engagement. It is also important that PA programs emphasize fun and enjoyment. Some degree of friendly competition among program participants and direct health counseling may promote the change process, but these elements should be in balance with other activities. In particular, older men and non-exercisers are not very interested in competition or other masculine-related attributes (Gough, 2006; Verdonk, 2010). Among these groups, motivation may be grounded more in health, well-being and being a role-model for the family or children (Verdonk, 2010).

A promising result of this study was that although the men were overweight or unfit, they desired to lose weight and reported an intention to change their health behavior. However, the effectiveness of the Adventures of Joe Finn campaign and fitness tests as promoters of health behavior changes among working-aged men was not examined. Further research is needed on the long-term effects of the health promotion campaign. Recent studies have questioned traditional claims that men lack interest in health issues (Caperchione et al., 2012; Gough, 2006; Pietilä, 2008), and this is supported by the present results. New forms of masculinity are challenging unhealthy and risk-taking behaviors (Caperchione et al., 2012; Pietilä, 2008). Previous results suggest that men's health promotion programs could be grounded in practical counseling that includes promotion of self-efficacy and behavioral skills (Olander et al., 2013). The Adventures of Joe Finn campaign provided self-monitoring (fitness tests) and personal feedback that could strengthen men's commitment to behavioral change. The next phase of the present research project will be to follow-up which elements of the campaign have promoted health behavior change among our sample of working-aged men. This knowledge could increase the effectiveness of health counseling and facilitate the targeting of supportive methods and materials. Further studies should also examine how self-efficacy for EB change differs from self-efficacy for PA change among working-aged men.

The present results pose some generalizability issues. The data were obtained from men who were likely to be more motivated and health conscious than their peers in the general population. The participants in the campaign had an interest in health issues as they had decided to enroll in the fitness tests. Moreover, this study reached only a small fraction of the 10 100 men who participated in the campaign's road tour during September 2011 (Heiskanen et al., 2012; Kaasalainen et al., 2013). Furthermore, the study participants were more representative of intermediate or highly educated middle-aged men than working-age Finnish men in general. Despite this selection in the data, the campaign may well have reached its target population more effectively than traditional recruitment methods. In this study, 17 per cent of participants had low education which is even slightly more than in population based survey (13%) (Helakorpi et al., 2011). A further limitation concerns the use of self-reports to assess readiness to change, eating habits and PA. Self-reports tend to overestimate healthy behaviors, and in addition, we had to use rough guides to evaluate diet and PA. A promising result was that the men were interested in changing their health behaviors. However, the differences found in the relative prevalence of PA and EB change may be affected by the scale used to assess readiness for change. It is possible that both unhealthy and healthy eaters were assigned to the action stage. Owing to the field conditions (open market places and a mobile test lab installed in a truck), a more detailed dietary and PA assessment would not have been viable. The high number of participants in the Adventures of Joe Finn campaign set practical constraints on the potential methods of assessing physical fitness. However, hand grip (Rantanen et al., 2012), the Polar OwnIndex Test (Borodulin et al., 2004) and the InBody 720 body composition analysis (Duz et al., 2009) have all been shown to be reliable for fitness testing in large samples.

Conclusions

The majority of the overweight and unfit working-aged men who participated in the Finnish health campaign expressed an intention to change their health behaviors and lose weight. Motivational readiness to increase PA was related to psychosocial factors, PA and healthier eating. The men reported that they were knowledgeable about the current physical activity guidelines and the components of a healthy meal. The younger men, compared to the older men, had greater PA self-efficacy and perceived themselves as more knowledgeable about healthy eating. However, this knowledge was not related to healthier eating habits. The results suggest that, among the working-aged men who participated in the PA campaign, self-rated knowledge about healthy meals and physical activity reflected not only an interest in health but also differences in age and education. There is a need for support on the social, organizational and individual

levels that encourages working-age men to implement their intentions to change their everyday health behaviors. Further studies are needed to explore the effectiveness of the Adventure of Joe Finn campaign as promoter of men's health behavior changes.

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Table 1. Descriptive statistics and differences in study variables stratified by age

	Age			
	18-34 (n=97)	**35-49 (n=133)**	**50-64 (n=132)**	**p[a]**
Body composition and physical fitness	**Mean(SD)**	**Mean(SD)**	**Mean(SD)**	
Visceral fat (VFA)	132.9 (35.7)	152.5 (42.7)	164.5 (63.1)	<0.001
Body mass index (BMI)	28.8 (3.9)	30.2 (4.5)	29.7 (4.2)	ns
Body fitness index (BFI)	-1.0 (1.3)	-1.1 (1.1)	-0.89 (1.0)	ns
PA level[b]	**f(%)**	**f(%)**	**f(%)**	
Low (<1h/wk)	21 (22.7)	50 (37.6)	46 (34.8)	ns
Moderate (1-3h/wk)	45 (46.4)	60 (45.1)	60 (45.5)	
High (>3h/wk)	30 (30.9)	23 (17.3)	26 (19.7)	
Stages of physical activity change	**f(%)**	**f(%)**	**f(%)**	
precontemplation	7 (8.2)	10 (7.5)	11 (8.3)	ns
contemplation	26 (26.8)	44 (33.1)	35 (26.5)	
preparation	35 (36.4)	51 (38.3)	65 (49.6)	
action/maintenance	28 (29.8)	28 (21.1)	21 (16.0)	
Psychosocial factors	**Mean(SD)**	**Mean(SD)**	**Mean(SD)**	
Perceived PA barriers	3.0 (0.53)	2.9 (0.63)	2.8 (0.97)	ns
Perceived PA promoters	2.9 (0.56)	2.8 (0.76)	2.6 (0.86)	0.05
PA self-efficacy	2.9 (0.62)	2.7 (0.76)	2.6 (0.76)	0.04
Eating habits score	7.20 (1.97)	6.98 (2.10)	7.76 (2.44)	<0.01
Eating behavior items	**f(%)**	**f(%)**	**f(%)**	
I tend to use vegetable fats in cooking	96 (76.0)	89 (71.2)	93 (76.9)	ns
I tend to use vegetable spread on bread	66 (68.8)	73 (57.9)	79(65.3)	ns
I tend to eat low-fat cold cuts	47 (49.0)	71 (56.8)	73 (60.8)	ns
I tend to eat low-fat cheese	43 (45.3)	54 (42.9)	82 (68.3)	<0.001
I tend to eat low-fat dairy products	68 (70.8)	84 (66.1)	92 (78.6)	ns
I eat fish at least 2 times/wk	18 (18.8)	41 (32.5)	62 (52.1)	<0.001
I eat whole grain daily	72 (75.0)	101 (80.2)	110 (90.2)	0.011
I eat F&V daily	68 (70.8)	96 (75.6)	96 (79.3)	ns
I tend to add salty spices in foods	53 (55.2)	60 (47.6)	46 (38.39	0.045
I have regular meal times	62 (64.6)	70 (55.1)	70 (58.3)	ns
I have a frequent habit of snacking	25 (26.0)	37 (29.4)	45 (37.2)	ns
I eat fast food several times a week	36 (38.3)	53 (43.1)	38 (33.3)	ns
Stages of eating behavior change	**f(%)**	**f(%)**	**f(%)**	
precontemplation	23 (23.7)	29 (21.8)	29 (22.0)	ns
contemplation	11 (11.3)	26 (19.5)	28 (21.2)	
preparation	26 (27.1)	31 (24.6)	34 (27.9)	
action/maintenance	37 (38.5)	45 (35.7)	36 (29.5)	
Knowledge	**f(%)**	**f(%)**	**f(%)**	
Know physical activity recommendations	85 (88.5)	122 (84.2)	116 (87.9)	ns
Know food plate model	83 (86.5)	108 (81.2)	96 (72.7)	0.03

SD=standard deviation, f=frequency, %=percentage, F&V=fruit and vegetables, a=differences tested with Kruskall-Wallis test and chi square-test, ns=no significant difference, b=Score for meeting PA recommendations computed on the basis of self-reported level of PA, active commuting and strength training.

Table 2. Differences in body composition, fitness, psychosocial factors and health behaviors by stage of change.

	Physical activity change			Eating Behavior change		
	Intention (n=278) Mean (sd)	Action (n=84) Mean (sd)	p	Intention (n=240) Mean (sd)	Action (n=122) Mean (sd)	p
Body fitness index (BFI)	-1.0 (1.1)	-0.83 (1.0)	ns	-0.9 (1.1)	-1.0 (1.2)	ns
Visceral fat (VFA)	151.8 (53.5)	150.8 (42.3)	ns	150.5 (52.2)	153.7 (48.8)	ns
Body mass index (BMI)	29.5 (4.1)	30.3 (4.7)	ns	29.4 (4.1)	30.2 (4.5)	ns
Age	44.7 (11.4)	40.7 (11.9)	0.012	44.7 (11.6)	42.4 (11.5)	ns
PA barriers	2.82 (0.8)	3.2 (0.6)	<0.001	2.8 (0.8)	3.1 (0.6)	0.016
PA promoters	2.7 (0.7)	2.9 (0.5)	0.002	2.7 (0.8)	2.8 (0.6)	ns
PA self-efficacy	2.6 (0.5)	3.1 (0.5)	<0.001	2.6 (0.8)	2.9 (0.6)	0.001
PA level	2.9 (1.2)	4.2 (1.1)	<0.001	3.2 (1.4)	3.3 (1.3)	ns
Eating habits score	7.2 (2.2)	7.9 (2.1)	0.014	7.1 (2.3)	7.7 (2.1)	0.015

a=difference calculated with Mann-Whitney-U test, ns=no significant difference, Stages of change (intention=no changes in health behavior, 2=changed health behavior during past year or maintenance of change).

Table 3. Multivariate logistic regression models for perceived health knowledge about physical activity recommendations and food plate model.

	Good perceived knowledge on PA guidelines[a]	Good perceived knowledge on food plate model[a]
	OR (95%CI)	**OR (95%CI)**
Demographical factors		
Age		
18-34	0.87 (0.36-2.10)	**2.57 (1.24-5.33)***
35-49	0.63 (0.30-1.32)	1.68 (0.92-3.07)
50-64	1.00	1.00
Education		
Missing	**0.10 (0.03-0.35)***	**0.21 (0.07-0.63)***
Low	**0.25 (0.08-0.75)***	0.74 0.27-2.00)
Intermediate	0.53 (0.24-1.18)	0.67 (0.37-1.25)
High	1.00	1.00
Body composition		
Visceral fat (<150cm2)	0.84 (0.38-1.85)	0.57 (0.29-1.10)
BMI (<30kg/m2)	0.90 (0.41-1.97)	1.25 (0.65-2.41)
Eating habits score		
Poor (6≤ points)	**0.20 (0.08-0.51)***	**0.34 (0.17-0.68)***
Intermediate (7-8 points)	0.49 (0.18-1.34)	0.82 (0.39-1.73)
Good (≥9 points)	1.00	1.00
Action Stage for EB change	1.91 (0.86-4.23)	1.87 (0.98-3.53)
Physical activity		
PA level		
Low	0.89 (0.37-2.14)	0.80 (0.31-2.01)
Moderate	1.06 (0.42-2,63)	0.60 (0.27-1.36)
High	1.00	1.00
Action Stage for PA change	0.89 (0.37-2.14)	0.72 (0.34-1.51)
Psychosocial factors		
Low barriers to PA	0.90 (0.47-1.75)	1.26 (0.73-2.19)
High promoters of PA	**2.37 (1.20-4.65)***	**2.13 (1.21-3-75)***
High self-efficacy for PA	1.34 (0.65-2.72)	1.68 (0.92-3.04)

a=Models are adjusted with age, education, body mass index, body fitness index and visceral fat area. *p<0.05