Planning to change diet: A controlled trial of an implementation intentions training intervention to reduce saturated fat intake among patients after myocardial infarction

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Abstract

Objective: This article investigates the effects of a brief psychological intervention—implementation intentions training—on the reduction of saturated fat intake among patients after myocardial infarction (MI). Methods: One hundred fourteen patients who had experienced a first uncomplicated MI took part in the study. Data were collected at approximately 1 week after MI, 2 weeks after short-term Phase 2 cardiac rehabilitation (approximately 2 months after MI), and 6 months after rehabilitation (8 months after MI). After data collection at 2 weeks after rehabilitation, patients were randomly assigned to the control group or the intervention group (an individually delivered implementation intentions training). Daily saturated fat intake was used as the primary outcome; total fat intake and percentage of calories from fat were secondary outcomes. Results: Repeated-measures analysis of variance showed a significant Time×Group interaction: Compared to time before MI, patients in both groups reported a decrease in saturated fat intake at 2 weeks after rehabilitation. Those who participated in the implementation intentions intervention were able to further decrease saturated fat intake from 22.88 g at 2 months after MI to 19.71 g at 8 months after MI. Patients from the control group maintained the same level of saturated fat intake at 2 months after MI (mean=22.30) and 6 months later (mean=22.47). Conclusions: An individually delivered implementation intentions intervention may reduce saturated fat intake among patients after MI.

Keywords: Implementation intention; Intervention; Myocardial infarction; Saturated fat; Randomized trial; Self-regulation

Introduction

Diet plays a key role in the initiation and progression of coronary heart disease [1]. A low-fat diet modifies cardiovascular risk factors with more favorable changes in total cholesterol and low-density lipoprotein cholesterol values than low-carbohydrate diets [2]. Randomized controlled trials have shown the effects of a change in fat intake on the reduction of mortality and coronary events among post-myocardial infarction (MI) patients. Results suggest that modification of fat intake, with reduction of saturated fat intake and increased use of foods rich in fatty acids other than saturated fatty acids, predicts better health outcomes [3–5].

Surviving an MI incident and enrolment in cardiac rehabilitation is often followed by an attempt to change one’s lifestyle, including reduction of fat consumption. At 3–5 years after MI, patients have lower intake of fat and energy, compared to age-matched and gender-matched controls [6]. Although levels of fat consumption may remain lower than those among healthy individuals, levels of body lipids increase at 2 years after rehabilitation (regardless of whether recommended exercise is maintained), compared to levels at the end of rehabilitation [7]. These changes may represent the return to a less favorable fat intake.
One of the options for improving cardiac rehabilitation is adding an individualized nutrition counseling component. However, compared to a standard rehabilitation program, additional extended individualized nutrition education resulted in no further changes in saturated fat indices on 6-week and 12-week follow-ups [8]. Research also suggests that some patients may have sufficient motivation to reduce fat consumption after MI even without the assistance of a formal treatment and try to change their diet by using self-help books [9]. However, these self-induced changes may only last for a short time after MI (i.e., 3–4 months) [7,9]. Additionally, almost a quarter of post-MI patients may incorporate no changes into their fat consumption [9].

Even if self-induced or rehabilitation-induced decrease in fat intake may occur after MI, majority of patients who turned into a more favorable diet still do not meet recommendations and, overall, consume more saturated fats than advised [8]. Hence, it is necessary to investigate whether any interventions that could be easily integrated into rehabilitation may induce further and longer-lasting changes in patients’ fat consumption.

Many theories, such as the Theory of Planned Behavior [10], identify intention formation as an important prerequisite of any action. In addition to intention formation, making specific plans, including details of actions and circumstances of implementing these actions, helps to act upon one’s own intentions [11,12]. Over 60 years ago, Lewin [13] made a distinction between an overall plan and a specific plan that facilitates goal attainment and suggested the importance of planning in the context of food choice. Among healthy individuals, implementation intentions (i.e., forming plans about when, where, and what type of food will be consumed) increase fruit and vegetable intake over periods of up to 2 weeks [14,15], lower the intake of food high in saturated fat for 5 days [16], and reduce fat consumption over a 1-month period [17].

As yet, however, the effects of forming plans have not been confirmed by studies conducted with patients and using longer follow-ups. Implementation intentions had no effect on undergoing prenatal screening if patients had already intended to participate in screening before forming plans [18]. Moreover, research has indicated that, among primary care patients with cardiovascular diseases, the longer-term (i.e., 3 months) effects of simply forming implementation intentions may be negligible for changes in fruit and vegetable consumption [19]. Prompting implementation intentions formation in nonstudent samples may require more than completion of a one-sentence form without assistance [18,19].

Implementation intentions interventions have typically invited participants to complete sentences specifying when and where they will perform specified actions [16–19]. Except for one study [20], implementation intentions interventions have been conducted without individual assistance and without any personal guidance or assistance. Consequently, we examined the longer-term potential of an individually delivered implementation intentions training to reduce saturated fat intake (and overall fat intake) among post-MI patients.

Aims of the study

The study investigates the effect of implementation intentions training intervention on the reduction of saturated fat (and fat intake reduction) among post-MI patients who participated in Phase 2 cardiac rehabilitation. It was hypothesized that, compared to controls, patients enrolled in the implementation intentions intervention (at 2 weeks after a cardiac rehabilitation program) would have lower saturated fat intake on 6-month follow-up. Similar effects of the intervention were expected for daily fat intake and percentage of calories from fat in daily calories intake.

Method

Participants

One hundred thirty patients post-uncomplicated-MI were invited to take part in the study. All approached patients agreed to participate. Eleven patients dropped out on the second wave of data collection; three control-group participants and two intervention-group participants dropped out on the third wave of data collection.

The final sample consisted of 114 patients aged 39–67 years (mean=54.25, S.D.=6.85); 64% were male. The majority were post-first-MI-episode patients (95%); 70% of patients used β-blockers after MI. Directly after MI, the patients’ mean total cholesterol level was 220.37 (S.D.=54.53), and body mass index (BMI) was 28.28 (S.D.=4.04). Eighty percent of respondents were married; 51% had completed high school education, and 21% had a university degree. The majority (67%) declared incomes within the range of average national income, 18% declared incomes below the average national income, and 15% declared incomes above the average national level.

Study design

We conducted a randomized controlled trial in order to evaluate the effects of the implementation intentions training on saturated fat intake among patients after MI and cardiac rehabilitation. Besides preintervention and postintervention assessments of fat consumption (Time 2 $T_2$ and Time 3 $T_3$ measurements, respectively), a retrospective measure of patients’ fat intake prior to MI (Time 1 $T_1$ measurement) was taken. The intervention and control procedures took place directly after $T_2$ assessment.

Procedures

The first wave of data collection took place 4–10 days after MI, when patients responded to questions regarding MI.
...and their fat intake prior to MI. Time 2 took place on the eighth week after MI (2 weeks after short-term rehabilitation). At this measurement point, patients were asked about their fat intake and intentions to reduce fat intake. At T3, which took place 8 months after MI, fat intake was measured again.

Time 1 data were collected from March 2002 to March 2003 at the cardiology units of four general hospitals. All eligible post-first-MI (or post-second-uncomplicated-MI) patients who were scheduled for Phase 2 rehabilitation after discharge were approached at 4–7 days after MI by members of the research team and were asked to participate on a voluntary basis. They were informed that the study would investigate the role of intentions in changing their lifestyle after MI and that data would be collected on three occasions. All patients gave an informed consent. Data collection at T2 and T3 took place in three rehabilitation centers for patients with cardiovascular diseases, to which the patients approached at T1 were referred. The short-term (2-week) rehabilitation program consisted of education regarding healthy nutrition (high in fruit and vegetable, and low in saturated fat), preparation of healthy meals and selection of healthy snacks, cardiovascular training exercises of low frequency, education about smoking, and a smoking-cessation program. Overall, the guidelines received followed the recommendations of the Nutrition Committee of the American Heart Association [5].

Patients who showed up at T2 appointment were randomly assigned to the control group (n=60) and the intervention group (n=59) based on a random number sequence (generated by a random digit generator) applied to the order of appointments scheduled at T2. While patients responded to T2 questionnaires, experimenters delivering the intervention telephoned the experimenter who was responsible for group assignment, received information about group assignment, and continued with the experiment. No blocking or stratification was employed in randomization procedures. Participants were not aware of their group assignment. The experimenters who assigned participants to the groups were not the same as those who created the number sequence or those who delivered the intervention. There were no deviations from the planned protocol.

At all waves, the experimenters assisted each patient individually; each participant was seen by one experimenter at all waves. The team of experimenters consisted of two rehabilitation specialists and two psychologists. All experimenters took part in a training session on delivering experimental-group and control-group procedures and received detailed intervention protocols; all of them saw participants from both the intervention group and the control group. The experimenters who delivered intervention-group and control-group procedures were blinded to group assignment. During the training, they were informed that they would deliver two types of intervention (one aimed at enhancing patients’ satisfaction with nutrition changes and their ability to seek support, and another aimed at planning skills training), whereas experimenters from other hospitals would deliver control-group procedures. After T3, the experimenters were asked (using a 5-point scale) whether both applied procedures resembled control procedures used in experimental studies. No significant differences in judgments about both procedures were found [t(3)=−0.52, P=.64].

**Control condition**

After completing T2 questionnaires, patients from the control group were reminded about the nutrition (including information on foods high in saturated fat and recommended saturated fat intake) and physical activity guidelines that were discussed during rehabilitation. Afterwards, the control-group participants engaged in a structured interview about their satisfaction with rehabilitation, changes in their health behaviors, and support received from family for resuming their daily life. The patients were complimented for seeking social support and for incorporating changes into their nutrition (e.g., implementing a low-fat diet). This procedure was used to control for the time intervention-group participants spent with the interviewer and the attention they received during T2, and to ensure that patients were not aware of group allocation. Control condition interviews lasted 10–20 min.

**Implementation intentions training condition**

After completing T2 questionnaires, patients from the intervention group received the same nutrition guidelines [5] as the control-group participants, including suggestions about the recommended daily intake of saturated fat, examples of meals composition, and information about snacks (suggestions on reduction of fat intake and selection of healthy low-fat snacks when a patient craves for food between meals).

According to the intervention protocol, patients allocated to the intervention group (a) received instructions about what implementation intentions training should include; (b) completed the intervention form; (c) screened the intervention form together with an interviewer and received supportive feedback from an interviewer regarding their implementation intentions; and (d) were complimented for successfully generating implementation intentions. The participants were assisted individually, and the intervention lasted 10–20 min. The experimenters reported that the length of the intervention depended mostly on the time needed for its second and third components; patients who needed more time for the second part also needed more time for the third part.

The interviewers followed a standardized script. First, patients were instructed that they would be asked to form a plan regarding their nutrition (in particular, reduction of saturated fat intake) and that their plan should always include information about when, where, and how to manage their...
daily fat intake. In particular, the patients were asked to focus on the fat included in the food they plan to eat and drink (and to provide information on fat content) and to list any fats they plan to use while preparing their meals (e.g., spreads, oil, dressings). The instruction of the implementation intentions form was: “I have my own plan that will help me to follow a low saturated fat diet (below, please write down your own plan about what and where you will eat). I plan to eat ... main meals a day. I plan to eat these main meals at a certain time of day, that is, between ... and ... (write down the hours). Please write down what foods and drinks you plan to take and the amount that you plan to eat: I plan to eat ... such foods as ... in the morning, such foods as ... in the afternoon, and such foods as ... in the evening. I plan to eat my main meals at ... (write down where you plan to eat each meal). I also have my plan about how to prepare these healthy meals. (Please write down sentences on how you plan to prepare your main meals: morning meal ...; afternoon meal(s) ...; and evening meal ...). I also plan to have a small amount of food between these main meals, such as ... (please write down what will you eat). I plan to snack on a certain time of day, that is, at ... and/or at ... (write down when you plan to snack).”

Next, patients and interviewers screened the intervention forms together, and interviewers provided feedback about the implementation intentions. They asked patients to provide more details about the type and amount of foods/drinks, amount and type of added fat, exact time, days of the week, and exact situational circumstances. For example, if a patient wrote down that he planned to eat some cooked meat, the interviewer asked about the type of meat, the amount, and the method of preparation (i.e., grilling, frying, and the use of fat in the preparation process). If a patient wrote down that he planned to drink milk for lunch, the interviewer asked about the amount of milk and its fat content. This part of the intervention continued until the plans were detailed in terms of the type and amount of food, as well as the time and situational circumstances. After the form had been completed and revised, interviewers applauded patients for their success in forming detailed plans. For example, an interviewer made comments that a plan was excellent and very precise, and, therefore, it would definitely help the patient to act as intended. The final plans developed by patients were in line with the nutrition guidelines delivered before the intervention in terms of saturated fat consumption, general fat consumption, and calorie intake. In both intervention and control groups, there were no deviations from standard protocols.

**Measures**

The primary outcome was change in saturated fat consumption across the three points of measurement. The secondary outcome was change in total fat intake (in grams per day and in percentage of calories from fat in daily diet). Fat intake indices were measured at all three waves of data collection. The controlled variable, total cholesterol, was measured at \( T_1 \), and intention was measured at \( T_2 \).

Saturated fat and total fat intakes were measured with the Meat/Snacks section of The Rapid Food Screener (RFS) [20] regarding nutrition in the last month (or in the month before MI at \( T_1 \)). RFS is a shortened version of The Food Screener and was validated against the latter [21], which in turn was validated using multiple diet records [22]. The questionnaire included figures with examples of portions and 15 questions referring to intake of meats, dairy products, spreads, and snacks. Responses are given on a 5-point scale (once per month or less, twice to thrice per month, once to twice per week, three to four times per week, or five or more times per week). Equations adjusted for gender allow for the calculation of daily nutrient intakes of total fat and saturated fat, and the percentage of calories from fat (estimation based on the average percentage of calories obtained from fat by individuals of the same age and gender) [20]. All three indices are based on the same set of items. In the present study, the mean responses for daily saturated fat intake were 34.29 (S.D.=7.56) at \( T_1 \), 22.97 (S.D.=5.91) at \( T_2 \), and 21.34 (S.D.=5.32) at \( T_3 \). The mean responses for daily total fat intake (in grams) were 107.44 (S.D.=18.39) at \( T_1 \), 76.51 (S.D.=15.41) at \( T_2 \), and 72.05 (S.D.=12.84) at \( T_3 \). The mean responses for the percentage of fat in daily diet were 38.32 (S.D.=4.60) at \( T_1 \), 30.58 (S.D.=3.82) at \( T_2 \), and 29.45 (S.D.=3.18) at \( T_3 \). Cronbach’s alpha values for the total Meat/Snacks section of RFS were .67, .76, and .71 at the respective waves of data collection.

At \( T_2 \), the intention to maintain a diet with a low saturated fat level and a low fat intake was measured with three items: (a) “Within the next 6 months, do you intend to eat less fatty foods such as butter, fat dressings, pizzas, fatty snacks?” (b) “Within the next 6 months, do you intend to eat less red meat (such as beef or pork)?” (c) “Within the next 6 months, do you intend to eat less food that is high in saturated fat (as defined earlier by your consultant)?” The responses were given on a scale from 1=definitely not to 4=definitely yes. Overall, participants reported that they intended to stick to a low-fat diet; the mean item response was 3.31 (S.D.=0.83, \( \alpha=.64 \)).

Total cholesterol was measured during patients’ stay at the hospital post-MI using enzymatic techniques, with a mean total cholesterol of 220.37 mg/dl (S.D.=54.53, range 120–488 mg/dl).

**Data analysis**

Repeated-measures analysis of variance (ANOVA) was used to test our hypotheses. Data were analyzed on a complete case basis with listwise deletion of missing cases. The final analyzed sample consisted of 57 intervention-group participants and 57 control-group participants. Besides age and gender, analyses were controlled for intentions and initial total cholesterol levels.
Results

Randomization check and dropout analysis

To check randomization, patients from the control and intervention groups were compared with respect to fat intake before the intervention, intentions, BMI, total cholesterol measure, and sociodemographic variables. The groups did not differ on age [F(1,113)=2.12, P=.15]; gender [χ²(1)=0.77, P=.38]; education [F(1,112)=2.95, P=.02]; BMI [F(1,112)=1.66, P=.20]; total cholesterol at Time 1 [F(1,113)=0.01, P=.96]; intention at T2 [F(1,112)=1.31, P=.42]; saturated fat intake at T1 [F(1,113)=0.56, P=.58] and T2 [F(1,113)=0.11, P=.79]; total fat intake at T1 [F(1,113)=0.26, P=.61] and T2 [F(1,113)=0.27, P=.60]; or the percentage of calories obtained from fat at T1 [F(1,113)=0.34, P=.56] or T2 [F(1,112)=0.72, P=.57].

To check for systematic dropout, patients who discontinued participating in the study at T2 or T3 were compared with those who took part in all waves of data collection. At T1, participants did not differ on age [F(1,128)=0.89, P=.35]; gender [χ²(1)=0.12, P=.73]; education [F(1,127)=3.20, P=.08]; BMI [F(1,127)=0.63, P=.43]; total cholesterol [F(1,128)=1.21, P=.27]; saturated fat intake [F(1,127)=0.08, P=.72]; total fat intake [F(1,128)=0.09, P=.70]; or the percentage of calories obtained from fat [F(1,127)=0.05, P=.77]. Additionally, there was no difference in intention between those who participated in all waves and those who dropped out at the last point of data collection [F(1,117)=1.69, P=.29]. Thus, dropout was not dependent on the core variables of the study.

Correlations between variables

For both groups, saturated fat intake was correlated moderately across waves [with r values ranging from .23 (P=.03) to .54 (P=.001)]. Intention to stick to a diet low in saturated fat was unrelated to fat intake, except for a weak association found for the intervention group at T2 (r=-.26, P=.03). The length of intervention-group and control-group procedures was unrelated to saturated fat consumption at Time 3 (r=.08, P=.29).

Effects of the intervention on fat intake

Repeated-measures ANOVA across all three time points revealed no main effect of Time for saturated fat intake [F(2,111)=1.50, P=.18, η²=.04] but a significant Time×Group interaction [F(2,111)=4.37, P=.02, η²=.10, post-hoc observed power test=.74]. The results are displayed in Fig. 1. Additionally, a repeated-measures ANOVA conducted to test changes from T2 to T3 showed no main Time effect [F(1,112)=0.11, P=.68, η²<.01] but a significant Time×Group interaction [F(2,112)=8.47, P=.008, η²=.09].

The groups did not differ on saturated fat intake before MI [F(1,113)=0.89, P=.27, η²=.01, Cohen’s d=0.12] and before the intervention (at 2 months after MI) [F(1,112)=0.27, P=.63, η²=.003, Cohen’s d=.01]. However, the groups differed on 6-month follow-up [F(1,112)=7.70, P=.003, η²=.09, Cohen’s d=.71]. These results support our hypothesis. Means, standard deviations, and 95% confidence intervals (CIs) are displayed in Table 1.

Similar effects of the intervention were found for secondary outcomes: total fat intake daily (in grams) and percentage of overall calories from fat. Repeated-measures ANOVA for changes across the three waves of data collection was carried out to control for participants’ age, gender, intention, and total cholesterol. Regarding total fat intake, ANOVA revealed no main effect of Time [F(2,110)=1.50, P=.18, η²=.04] but a significant Time×Group interaction [F(2,110)=4.37, P=.009, η²=.10, post-hoc observed power test=.74]. Regarding the percentage of calories obtained daily from fat, ANOVA revealed no main effect of Time [F(2,110)=1.51, P=.18, η²=.04] but a significant Time×Group interaction [F(2,110)=4.34, P=.02, η²=.09, post-hoc observed power test=.74]. A similar pattern of results that excluded the first wave of data collection was found for repeated-measures ANOVA:

The main time effects were found for neither total fat intake nor the percentage of calories obtained from fat. However, there was a significant Time×Group interaction for both total fat intake [F(1,111)=8.46, P=.009, η²=.10] and percentage of calories obtained from fat [F(1,111)=8.38, P=.01, η²=.09]. Descriptive statistics for secondary outcomes are displayed in Table 1.

Intentions to maintain a diet with a low saturated fat level may moderate the effects of the implementation intentions intervention [12]. To test this assumption, hierarchical regression analysis [23] was performed. Saturated fat intake at T2 entered at the first step (β=.47, P=.000) and group allocation entered at the second step (β=.27, P=.002) predicted saturated fat intake at T3. Intention entered at the third step was marginally related to T3 saturated fat intake (β=-.16, P=.08). The interaction term (Intention×Group Allocation) entered at the fourth step was unrelated to our main outcome (β=.15, P=.10). The intention to maintain the
Table 1
Fat intake in the control and intervention groups at Time 1 (before MI), Time 2 (before the intervention, at 2 weeks post-MI rehabilitation), and Time 3 (on 6-month follow-up)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control group</th>
<th>Intervention group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (S.D.)</td>
<td>Mean (S.D.)</td>
</tr>
<tr>
<td></td>
<td>95% CI</td>
<td>95% CI</td>
</tr>
<tr>
<td>Saturated fat daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>35.07 (7.24)</td>
<td>33.09–37.05</td>
</tr>
<tr>
<td>Time 2</td>
<td>22.30 (4.79)</td>
<td>20.76–23.84</td>
</tr>
<tr>
<td>Time 3</td>
<td>22.47 (5.22)</td>
<td>21.10–23.85</td>
</tr>
<tr>
<td>Total fat intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>109.55 (16.89)</td>
<td>104.87–115.19</td>
</tr>
<tr>
<td>Time 2</td>
<td>74.09 (14.00)</td>
<td>70.97–79.22</td>
</tr>
<tr>
<td>Time 3</td>
<td>74.89 (13.58)</td>
<td>72.13–79.10</td>
</tr>
<tr>
<td>Percentage of calories from fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>38.91 (4.29)</td>
<td>37.66–40.29</td>
</tr>
<tr>
<td>Time 2</td>
<td>29.97 (3.44)</td>
<td>29.15–31.25</td>
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<tr>
<td>Time 3</td>
<td>30.18 (3.37)</td>
<td>29.45–31.23</td>
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</table>

Discussion

The results of the present study showing that the effects of a 20-min intervention employed after cardiac rehabilitation may last for 6 months provide strong evidence for the role of implementation intentions in the promotion of low saturated fat intake. Compared to the control group, participants in the implementation intentions training intervention ate less saturated fat on follow-up. The size of the reduction obtained by means of the implementation intentions training was moderate. Similar effects were found for total fat consumption and for the percentage of calories obtained from fat.

As previous research has suggested, individuals who survived MI and/or who participated in Phase 2 cardiac rehabilitation change their fat intake after MI or rehabilitation [6,9]. However, this change is not always maintained over a time period of 6 months or more [7,8]. The addition of a simple implementation intentions training to cardiac rehabilitation may increase the effectiveness of cardiac rehabilitation in terms of promoting a longer-term reduction of saturated fat intake.

Previous randomized controlled trials have shown that complex cognitive–behavioral interventions result in a decrease in fat consumption among individuals who are at risk for coronary heart disease [24,25], patients with coronary artery disease [26], or patients enrolled in cardiac rehabilitation [27]. These findings were obtained for follow-up periods of up to 18 months. However, showing that an intervention works is as important as showing why an intervention works [28]. Research evaluating the effects of complex cognitive–behavioral treatment programs does not allow conclusions about the active component of the intervention (i.e., the component that actually triggers nutrition change) to be drawn. By contrast, evaluating a simple intervention, such as the implementation intentions training, helps to establish the most effective ways of influencing behaviors.

There is some evidence suggesting that implementation intentions interventions in which individuals simply write down when, where, and how they plan to behave may be not sufficient to change behaviors such as fruit and vegetable consumption among patients [19]. The results of the present study suggest that if post-MI patients are trained how to form plans in a face-to-face procedure, they may be able to further change saturated fat consumption. Difficult goals, such as reduction of saturated fat intake, may require more elaboration on how the action should be performed [29]. Further studies are necessary to directly compare whether an assisted implementation intentions training may lead to a greater change in saturated fat intake than just filling out a simple form. Assisted implementation intentions interventions may result in high adherence to the intervention protocol: In the present study, all participants assigned to the intervention group completed the implementation intentions forms. Indeed, high compliance may influence the effectiveness of the intervention. The procedures used in the present study can be easily trained by rehabilitation specialists and incorporated into the treatment of patients after MI.

The present study has several limitations. Fat intake was measured by self-report, albeit with a validated instrument [21,22]. Objective measures of patients’ adherence to a recommended diet low in saturated fat would be preferable but would have been difficult to collect in this context. Future studies should test the effect of implementation intentions on maintenance for longer than half a year. Outcome assessors were not blinded, which could have an effect on responses collected at Time 3. Although both intervention-group and control-group participants received nutrition counseling during rehabilitation and were reminded about nutrition guidelines during experimental procedures, it is possible that focusing on nutrition during the implementation intentions intervention influenced the results. Future studies should control for focusing on the target behavior during the experimental procedures. Moreover, future research should test for the effects of the implementation intentions training among patients who are not enrolled in a rehabilitation program. The experimental condition, which included writing down plans, can be interpreted as more demanding or engaging than the control condition. The differences between procedures could affect obtained results. Although we used a standardized protocol, the intervention varied among patients in some aspects (e.g., number of revisions made in the initial planning form). Those differences may moderate the effectiveness of the implementation intentions training. Hence, future interventions should be videotaped, and the respective differences should be tested. As the intervention protocol excludes correcting “unhealthy” plans by means of the interviewer’s action, some patients may end up forming
plans that are against nutrition recommendations. In the present study, we expected that the nutrition education delivered before the intervention would prevent patients from forming “unhealthy” plans. Yet, future interventions may need to add a “rearranging plans” component if they do not follow nutrition guidelines.

The study lacks an evaluation of changes in cognition and self-regulatory abilities that could mediate the effects of the intervention. The way in which the intervention was delivered could increase participants’ motivation through normative influence. Future studies should analyze intervention-induced changes in motivational and volition-based processes; such analyses are necessary to further understand the process in which interventions affect behaviors [28].

Future research should also include a control condition that focuses entirely on filling in planning forms without subsequent discussion; such procedures would allow to test the effectiveness of adding feedback and reinforcing comments to a standard implementation intentions intervention. Consequently, replication is warranted.

The present research contributes to the understanding of fit intake following MI and cardiac rehabilitation. Participation in an implementation intentions training intervention delivered after rehabilitation resulted in a further decrease in saturated fat consumption, compared to rehabilitation alone. A simple cost-effective intervention may help to reduce the risk of mortality and coronary events among patients after MI.

References


