

Strategies of return to self-regulation among obese people: Implementation of goal's intention and motivation to weight reduction

Authors' Contribution:

- A Study Design
- B Data Collection
- C Statistical Analysis
- D Data Interpretation
- E Manuscript Preparation
- F Literature Search
- G Funds Collection

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abstract

- Background** Implementation intentions is one of self-regulation strategies enabling priority goals achieving. This method is based on accurate planning of a variety of activities by which goal's realization is more probable. The aim of the research was to evaluate the impact of the implementation intention technique on motivational and behavioral aspects of eating self-regulation among obese people.
- Material/Methods** A total of 100 obese people, abiding by a slimming program organized in an obesity clinic in Olsztyn in Poland, participated in the research. In the experimental group an implementation intentions technique for eating habit were applied. The impact of the applied method on motivational and behavioral aspects of eating self-regulation were verified through participants' answers to the Goal's Survey and through the tested subjects' propensity for selecting high-calorie foods. The Goal Survey was developed solely for the purposes of this study.
- Results** Members of the experimental group exposed to the implementation intention strategy had higher motivation to weight reduction measured by the Goal Survey and were less likely to select high-calorie foods than the control subjects.
- Conclusions** Implementation of goal's intention is an efficient technique which improves motivation to weight reduction and effectively modifies eating habits among obese people. Application of the above method in psychological intervention of obesity treatment can constitute one of the factors enabling process of changing eating habits and losing weight.
- Key words** obesity, weight reduction, implementation of goal's intention.

article details

- Article statistics** **Word count:** 2,191; **Tables:** 0; **Figures:** 3; **References:** 22
Received: September 2014; **Accepted:** June 2015; **Published:** June 2015
- Full-text PDF:** <http://www.balticsportscience.com>
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- Indexation:** Celdes, CNKI Scholar (China National Knowledge Infrastructure), CNPIEC, De Gruyter - IBR (International Bibliography of Reviews of Scholarly Literature in the Humanities and Social Sciences), De Gruyter - IBZ (International Bibliography of Periodical Literature in the Humanities and Social Sciences), DOAJ, EBSCO - Central & Eastern European Academic Source, EBSCO - SPORTDiscus, EBSCO Discovery Service, Google Scholar, Index Copernicus, J-Gate, Naviga (Softweco, Primo Central (ExLibris), ProQuest - Family Health, ProQuest - Health & Medical Complete, ProQuest - Illustrata: Health Sciences, ProQuest - Nursing & Allied Health Source, Summon (Serials Solutions/ProQuest, TDOne (TDNet), Ulrich's Periodicals Directory/ulrichsweb, WorldCat (OCLC)
- Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
- Conflict of interest:** Authors have declared that no competing interest exists.
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INTRODUCTION

According to the World Health Organization, obesity and overweight pose one of the greatest health risks in highly industrialized countries. The prevalence of obesity continues to increase at an alarming rate around the world. According to WHO data for 2009 [1], more people die from obesity than from malnutrition in the contemporary world. Obesity leads to numerous health problems and disorders. It is one of the leading causes of hypertension, coronary heart disease, stroke, type 2 diabetes and certain types of cancer [2]. Excessive body weight also significantly lowers self-esteem and the quality of life in the sense of social belonging. The alarming increase in the number of obese and overweight people, in particular in the United States, and the resulting health consequences contribute to a steady rise in health care costs [3]. According to the Rush University Medical Center [4], multicomponent lifestyle intervention is one of the most effective methods of inducing permanent changes in body weight.

Successful lifestyle interventions draw on the skills of experienced professionals who use a variety of therapeutic techniques in order to improve self-regulation capabilities in goal achievement. Examples of those techniques are: self-monitoring, modeling, environmental restructuring and group and individual support. Results of Powell, Calvin III and Calvin Jr. research [4] show that lifestyle interventions containing, among others, self-regulation techniques for obesity can produce modest but clinically significant reductions in weight with minimal risk. Gollwitzer [5] claims that whether people meet their goals depends on both how the goal content is framed and how people regulate the respective goal directed activities. Therefore, adequate self-regulatory capacities are essential to achieve any life's goal effectively.

The success of lifestyle modification strategies requires a well-prepared plan. In an effective plan, circumstances that trigger the analyzed activities should be linked with specific behaviors [6]. Plans that only formulate intentions merely describe goals, whereas the implementation intention strategy focuses on the practical aspects of the task, namely where, when and how the task should be executed. In the implementation intention process, a highly detailed plan is developed for a specific situation. Brandstaetter, Lengfeld and Gollwitzer [6] demonstrated that implementation intention is a highly effective method for initiating action and achieving the desired goals.

The implementation intention strategy speeds up the response to a stimulus by freeing cognitive resources for processing situations and objects that are part of the developed plan [5]. External stimuli trigger automatic behaviors that contribute to goal attainment. Implementation intentions are also effective in the event of a cognitive overload that can deplete self-control resources [6]. This realistic and detailed planning strategy leads to the automatization of behaviors by transforming conscious efforts at self-regulation into implicit self-control that is resistant to external stimuli [9, 10, 11]. The process can be reinforced by training the desired behaviors [8]. In a study by Luszczynska [12], a simple implementation intention process led to changes in eating behavior when repeated only three times. This self-regulation planning strategy enables subjects to initiate action, experience self-control and promote self-efficiency. Also in different studies implementation of intentions resulted in better effects of weight reduction

among obese people participating in Weight Loss Programs in comparison to a control group who did not use this strategy [13, 14].

Self-efficacy, on the other hand, is a crucial concept of Albert Bandura's social cognitive learning model [15]. It is the extent of one's belief in one's own ability to control behaviors and reach goals. According to Bandura [15], personal impact is one of factors determining abilities to adaptation and personal development. Besides, the author claims that people who develop their own self-regulatory competences, abilities and therefore self-efficacy experience free will to a greater degree. Bandura emphasizes that the sense of free will firstly depends on abilities of intentions formulating or goals creation, secondly on abilities of future visualization and thirdly on auto-reflection capabilities. So-called free will can be identified with autonomous motivation which is the essence of Deci and Ryan's auto-determination concept [16,17]. Autonomous activities are highly integrated with standards in accordance with self that is own values, needs, preferences. Autonomous motivation causes that humans activities are featured by stronger perseverance, leads to higher achievements or more creative solutions which results in improvement in well-being [18].

The aim of the present study was to determine the effectiveness of related to healthy eating habits implementation intention technique's impact on motivational and behavioral aspects of eating self-regulation among obese people enrolled in a weight-loss program. Motivational and behavioral aspects of eating self-regulation include beliefs and behavioral strategies related to food and eating.

MATERIALS AND METHODS

This study evaluated a total of 100 obese people (BMI > 30), including 72 women and 28 men aged 29 to 56, enrolled in a weight-loss program in an obesity clinic in Olsztyn. The subjects were divided into an experimental group and a control group. The study groups were randomized.

The first task pertained to completing the Goal Survey by participants from both groups. The Goal Survey was developed solely for the purposes of this study [19]. The questionnaire comprised two statements related to the realization of various objectives: 1) Losing excessive kilograms (Goal Survey) and 2) Introducing healthy eating habits (Goal Survey). Participants from both groups assessed the importance of various objectives included in the survey using a 7-item scale. The reliability of the Goal Survey with regards to these two statements proved sufficiently high $\alpha = 0.89$.

Next only in the experimental group the implementation intention strategy was applied. Members of the experimental group were given one day to develop a list of techniques for resisting high-calorie foods during and, in particular, after the weight-loss program. The new coping strategies had to be autonomous, realistic, practical and they had to address the type, place and time of every meal in a detailed and practical manner. The ideas generated by the participants were discussed with other experimental group members. In the following days, the subjects were asked to complete the list with new resolutions and ideas for changing their eating habits and avoiding high-calorie foods.

The final part of the study took place after the end of the two-week weight-loss program in the obesity clinic. All participants from experimental and control groups were repeatedly examined by completing the Goals' Survey, which described their level of motivation connected with the process of slimming. Also, which was an additional part of the final measure, in reward for their diligence and participation in the weight-loss program, the participants were offered a special reward based on their individual preferences. The subjects could choose only one product from the following list: one square of chocolate, one apple, one carrot, one biscuit, one grapefruit or three potato crisps. After the participants had written down their choices on a piece of paper, they were told that the choice of treat was only a part of the experiment. They were rewarded for their participation in the study only with the listed low-calorie products: carrots, apples or grapefruits.

RESULTS

Goal Survey results of the experiment were verified in a statistical program SPSS 20 on the basis of an analysis of variance for repeated measures with using F- Snedecor test. The design gender (2) x group (2) was used to explain the variance of the dependent variables, namely two objectives included in the Goal Survey.

In the case of Losing excess kilograms we observed the significance between the first and the second (repeated) measure that is a significant effect of manipulation in the experimental group $F(1,49) = 19.49$; $p < 0.001$ $Eta^2 = 0.29$, Experimental group: $M1 = 6,18$, $M2 = 6,60$, $t(49) = -4.41$; $p < 0.0001$

Control group: $M1 = 6.20$, $M2 = 6.28$; p - insignificant.

In the case of the Losing excess kilograms we also observed a significant effect of manipulation $F(1,96) = 8.57$; $p = 0.005$, $Eta^2 = 0.082$, $M2$ (experimental group)=6.60, $M2$ (control group) = 6.28, $t(98) = 2.80$; $p < 0.002$

Analysis of variance did not show any impact of gender on the results: $F < 1$ (Fig 1).

In the case of introducing healthy eating habits we observed the significance between the first and the second (repeated) measure that is a significant effect of manipulation in the experimental group $F(1,49) = 19.60$; $p < 0.0001$, $Eta^2 = 0.29$, Experimental group $M1 = 6.30$, $M2 = 6.70$ $t(49) = -4.43$; $p < 0.0001$, Control group $M1 = 6.25$, $M2 = 6.28$; p - insignificant.

In the case of Introducing healthy eating habits we also observed a significant main effect for manipulation $F(1,96) = 8.11$; $p = 0.006$, $Eta^2 = 0.08$, $M2$ (experimental group) = 6,70, $M2$ (control group) = 6.28, $t(98) = 3.54$; $p < 0.002$

Also in this case we did not observe any impact of gender on the results: $F < 1$ (Fig 2).

The results of the experiment in the part of food choice were verified in the statistical program SPSS 20 by an analysis of variance with using F-Snedecor test with a 2 (gender) x 2 (group), where the choice of a high-calorie food was the dependent variable. A statistical analysis revealed no main effect of gender $F < 1$ and a significant effect of group on the choice of high-calorie

food M (experimental group) = 1.08 versus M (control group) = 1.16, $t(98) = -1.22$, $p < 0.01$). In the experimental group 46 subjects chose healthy food and 4 subjects chose high-calorie food. In the control group 40 subjects chose healthy food and 10 subjects chose high-calorie food. The implementation intention strategy significantly decreased the frequency of high-calorie food choices in the experimental group in comparison with the control one (Fig 3).

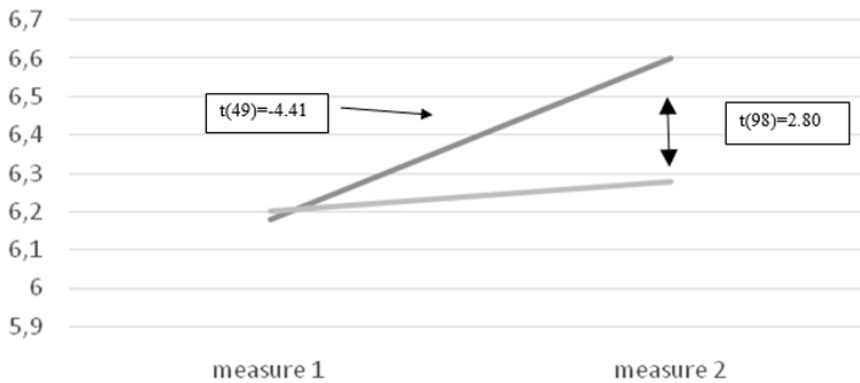


Fig 1. R significant effect of manipulation and group after manipulation for the goal: Losing excess kilograms on the choice of high-calorie food

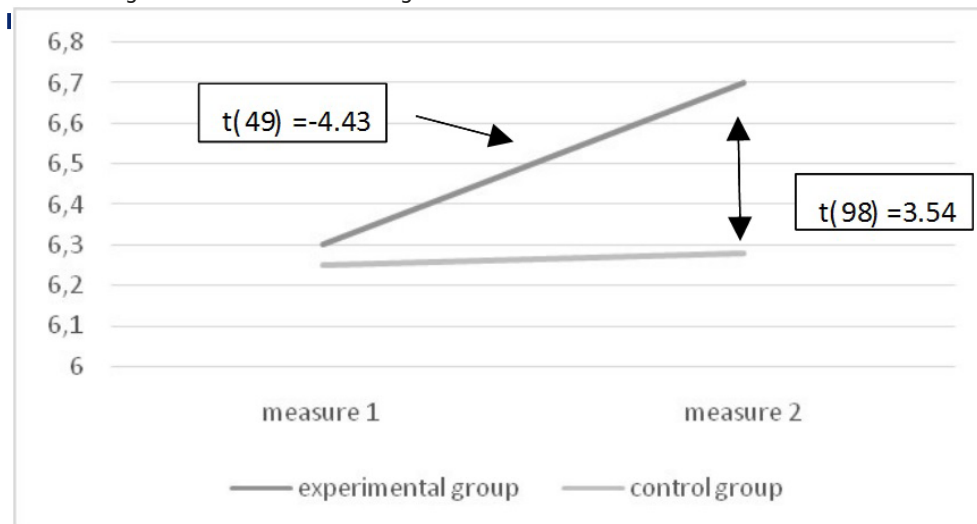


Fig 2. A significant effect of manipulation and group after manipulation for the goal: Introducing healthy eating habits on the choice of high-calorie food.

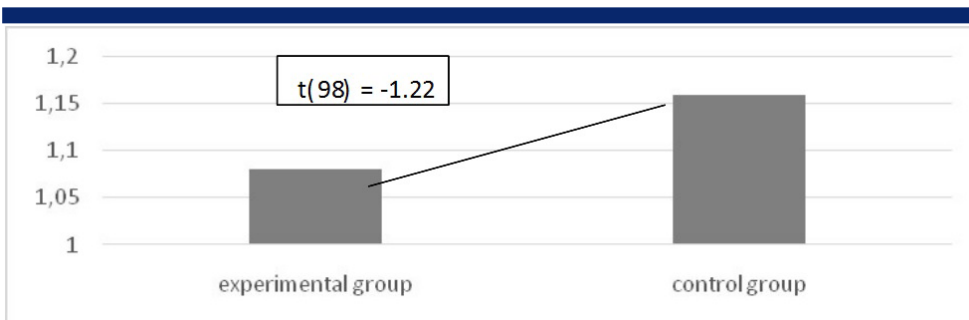


Fig 3. A significant effect of group on the choice of high-calorie food.

DISCUSSION

The aim of the study was to determine the effect of the implementation intention strategy on the motivational and behavioral aspects of obese people's self-regulation. The effectivity of self-regulation motivational aspect was evaluated by Goals Survey's repeated measure. The above questionnaire determined the level of importance of two goals related to the slimming process.

The conducted statistical analysis revealed that application of implementation intentions resulted insignificant differences in levels of the importance of two goals between the experimental and the control group. The repeated Goal's Survey measurement showed that at the end of the slimming program the experimental group participants attached higher importance to two goals such as losing excess kilograms and introducing healthy eating habits than the control group participants. We observed a significant manipulation effect and a group effect in the second measurement. Therefore, we can accept that active cognitive engagement using implementation of intentions in a process of eating habits change caused an increase in obese people's motivation in the weight reduction process.

Next when it comes to self-regulation's behavioral aspect, the behavior of subjects who were confronted with a choice of high-calorie foods points to the effectiveness of the analyzed strategy. Members of the experimental group who were exposed to the implementation intention strategy were more likely to resist the temptation of high-calorie foods than control subjects. The results of the study indicate that effective management of self-regulation resources, which relies mainly on appropriate self-control strategies, is required to induce essential changes in eating habits.

The results of this study and the findings of similar experiments [12, 13, 14] suggest that implementation intention is an effective self-regulation strategy that influences implicit self-control resources. Unlike voluntary self-control, implicit self-control is a simple, effective and faultless mechanism [10]. It is resistant to psychophysical overload that can deplete voluntary self-control resources and increase the risk of goal abandonment [8]. When the implementation intention strategy is applied, external stimuli trigger automatic behaviors that contribute to the attainment of weight-loss goals [11].

LIMITATION

However, there are some limitations to the present study that should inform future work. Future research on that subject could be improved by introducing an equal number of males and females to the experiment.

CONCLUSIONS

Being overweight and obese has become a mass phenomenon with a pronounced upward trend in prevalence in most countries throughout the world [20]. The estimated number of individuals from the European Union who suffer from obesity is 69 million (17%), with the yearly increase in the number of obese individuals amounting to 4 million. For example in Poland, half of the adult population is overweight, and every sixth person is obese. Studies of Polish adolescents produce even more alarming results - 29% of Polish te-

enagers are overweight [21]. The number of over-weight children who are likely to become obese adults is growing at an ever faster rate than in the US. As a result, obesity constitutes an important social problem and is frequently referred to as an epidemic of the 21st century [20, 22]. Therefore, there is a diligence to generate new, effective methods facilitating multi-dimensional process of weight reduction.

The results of above study constitute important theoretical inputs, and they could contribute to the effectiveness of psychological interventions in obesity treatment. The implementation intention strategy significantly influences the process of weight loss maintenance and therefore return to self-regulation among obese people.

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