

‘The effects of a goal-setting intervention on frequency of participation in organized
exercise programmes for women

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Abstract

The purpose of this study was to examine the effect of a goal-setting intervention on frequency of participation in women attending organized exercise programmes. Participants were 36 women (Mage = 38.13, SD= 7.40), who were assigned into intervention (n= 17) and control (n=19) groups. The intervention lasted eight weeks, during which the intervention group was trained and consulted for the use of goal-setting. Frequency of attendance was recorded four weeks prior to the onset of the study (W-4-W0), during the intervention (W1-W4 and W5-W8), and four weeks following the completion of the intervention (W9-W12). In addition, the satisfaction of the basic psychological needs were assessed before and after the completion of the intervention. The results showed that (a) for the intervention group frequency of participation increased from W-4-W0 to W1-W4 ($p < .05$), remained stable from W1-W4 to W5-W8 ($p = .40$), and decreased from W5-W8 to W9-W12 ($p < .01$); (b) for the control group, frequency decreased from W-4-W0 to W1-W4 ($p < .01$), remained stable from W1-W4 to W5-W8 ($p = .35$), and from W5-W8 to W9-W12 ($p = .67$). Regarding the satisfaction of psychological needs, it was revealed that score on competence increased for the intervention group but remained stable for the control group, and scores for autonomy remained stable for the intervention group but decreased for the control group. The findings showed that goal-setting has positive effects on participation for as long as the intervention lasted; however, these effects were not sustained after its conclusion, suggesting (a) goal-setting consultants may help improving adherence in organized programmes, and (b) that such interventions should place emphasis on developing individuals' skills on goal setting.

Introduction

Regular exercise and balanced diet are the most important factors for a healthy lifestyle. Yet, even in the 21st century, these accomplishments seem difficult for many people to reach. The Western model of life seems to promote rather the opposites, like sedentary life and fast food, because of the fast pace of modern way of living. However, this type of living carries several negative effects, most important of which is, health issues. Even though, people are well-informed nowadays about the prevention of health issues, through regular exercise, only a small percentage adhere to the recommendations. The World Health Organization suggests that “Adults aged 18–64 years should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week, or do at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity. Aerobic activity should be performed in bouts of at least 10 minutes duration. For additional health benefits, adults should increase their moderate-intensity aerobic physical activity to 300 minutes per week, or engage in 150 minutes of vigorous-intensity aerobic physical activity per week, or an equivalent combination of moderate- and vigorous-intensity activity. Muscle-strengthening activities should be done involving major muscle groups on 2 or more days a week.” (World Health Organization, 2018). Similar guidelines have been also given by the U.S. Office of Disease Prevention and Health Promotion. However, recent surveys indicate that the active percentage of exercisers is not high. A recent survey of the U.S. Centers for Disease Control and Prevention, in 2016, showed that the percentage of adults, aged 18 and over, who met the Physical Activity Guidelines for aerobic physical activity, was 51.7%. The percentage of adults, aged 18 and over, who met the Physical Activity Guidelines for both aerobic and muscle-strengthening activity,

was just 21.7% (Centers for Disease Control and Prevention, 2016). These results imply that there is yet a long way and effort towards a healthy life, in which physical activity is a way of living rather than a 'compulsory habit'.

Because of the aforementioned reasons, researchers shared their interest in studying behavioral theories, with which could possibly affect human behavior, in order to increase physical activity. Several studies will be presented in subsequent sections that were based on these theories, which used several techniques to promote exercise and healthy life style.

Self-Determination Theory

One of the most important theories in the exercise motivation and behaviour is the Self-Determination Theory, by Deci and Ryan (1985, 2000). This theory explains that people are driven, to engage in activities, by three basic psychological needs; the need for competence, autonomy, and relatedness. Autonomy expresses the need to experience sense of choice over initiation and regulation of behavior, competence expresses the need to produce outcomes and understand the contingencies leading to these outcomes, and relatedness expresses the need to experience satisfactory relationships with others (Taylor, Ntoumanis, Standage & Spray, 2010). The psychological needs are innate, which means that people are born with psychological needs, and necessary, which means that satisfaction of psychological needs is necessary for human growth. People have the ingrown need to satisfy these three parameters while enrolling into an activity, and if they do satisfy them, their motivation levels to participate increase (Frederick, Morrison & Manning, 1996). Thus, people with high levels of psychological need satisfaction, adhere more effectively in an activity or programme (Edmunds, Ntoumanis & Duda, 2007).

According to the Self-Determination Theory, people engage into activities because they are either intrinsically or extrinsically motivated. The nature of behavioral regulation is multidimensional, which provide us with a self-determination continuum that explains the reasons for enacting a behavior. This continuum starts with the factor Amotivation, which expresses that the person has no intention at all to engage in the activity. Then comes external regulation, where the person enrolls in the activity because of some reward, or with the purpose of avoiding punishment. Next is introjected regulation, in which external reasons to engage in the activity, have become internalized. To continue with, identified regulation, which explains that the person now has been active because of the importance he/she considers the activity has, and then follows integrated regulation, which shows that the behavior is now a part of one's self. Lastly and more importantly, intrinsic motivation, which indicates that the person engages into an activity because of the enjoyment he/she experiences, while learning, accomplishing things, and living exciting sensory experiences.

The numerous researchers through the years, have studied the multidimensional behavioral model, and run various trials and interventions in order to identify the most effective type of motivation. When a person is intrinsically motivated it means that engages in a behavior for itself and for the pleasant and satisfaction derived from participation. When a person is extrinsically motivated it means that enrolls in the behavior because of an expected outcome that derives from the behavior (Deci, 1971; Vallerand 2007). It has been well-established that the most important is intrinsic motivation, not only in everyday life but also in exercise settings (Richard, 1997; Hagger & Chatzisarantis, 2007). People who are intrinsically motivated are more likely to continue the behavior in long-term periods (Rodgers et al., 2010), exactly because they enjoy it, whereas people who are extrinsically motivated, once they get

the reward, or reach expected outcome, they will probably quit the activity (Vallerand, 1997).

Goal-setting

The process of establishing a level of performance proficiency which should be reached within a prescribed time period is known as goal-setting (Cashmore, 2008). Goal-setting is a technique that directs attention, mobilizes effort, prolongs exercise persistence, fosters the development of new learning strategies, and affects confidence level satisfaction (Locke, Shaw, Saari, & Latham, 1981; Cashmore, 2008). Moderators for successful goals are commitment, person's ability, feedback, task complexity, etc. It is important when someone uses the technique that he/she follows some important guidelines. For example, goals been set should be specific and measurable, should have moderate difficulty but also be realistic, should be both long and short term, should be both performance and process, and the person should develop plans to reach, to re-evaluate, and to record these goals (Theodorakis & Goudas, 2002; Theodorakis, 2017). To sum up these guidelines, a 'technique' was proposed, named 'S.M.A.R.T.'. It actually is the acronyms for specific, measurable, attainable, relevant and time-specific. The literature shows that S.M.A.R.T. guideline, which is originated from the theory, can help the person create a strategy to reach his/her goals (Bovend'Eerdt, Botell, & Wade, 2009).

Connected with the Self-Determination Theory, it is known that exercisers seek certain goals through their exercise participation that are intrigued by the three psychological needs of competence, autonomy and relatedness. When physical activity programmes satisfy exercisers' needs, and consequent goals, intrinsic motivation will be increased (Markland, 1999). In order to make goals facilitate intrinsic motivation, and thus increase exercise adherence, the characteristics of the

goals should be examined. There are 3 types of goals; outcome goals, which focus on the result or outcome of an action/activity, performance goals that help the person focus on improving his/her own performance, and process goals, which focus on the procedure that someone can possibly follow to reach the goal. The research so far concludes that process goals are more effective in exercise settings, because they help the exerciser focus his/her attention to the behavior itself, in contrast to outcome of that behavior, and thus it is more possible to maintain long-term adherence (Field & Steinhardt, 1992; Biddle 1995).

From the before mentioned it is concluded that goal-setting is indeed a technique that can be used by exercisers in order to increase exercise adherence, but this technique has to follow specific guidelines based on the theories and literature. Goals that promote the satisfaction of three basic psychological needs, are necessary. Also, goals should focused more on process rather that outcome, they should be set according to the SMART rules, and more importantly an consultant should help the exerciser evaluate and modify his/her goals, in order to make sure that the participant follows the procedure properly.

Literature Review

One of the first studies that examined the relationship of goal-setting and adherence was conducted by Schafer, Glasgow, and McCaul (1982), in order to investigate possible exercise changes in diabetic adolescence. Three Type I diabetic adolescence, from 16 to 18 years old, participated in the study. The three participants, with the assist of a therapist, learned and used the technique of goal-setting, and assessed daily and weekly goals. The sample self-monitored their progress and with the help of the counselor, did all the necessary adjustments. The self-monitoring face lasted minimum for one week. Measurements were conducted based on the self-

monitoring the participants did and on the control measure of urine glucose tests. For the first participant, goal-setting was beneficial, as she increased frequency of exercise, of doing glucose tests, and wearing diabetic identification, after 8 weeks and 12 sessions with the therapist. For the second participant, after 6 weeks and 12 sessions, goal-setting helped him improve frequency of glyucose tests. However, he experienced some reactance to the contracting procedures, so compliance with his 'time of insulin injection' goal was not very effective. On exercise frequency he failed on increasing it, but succeeded on maintaining consistency. Lastly, for the third participant, after 11 sessions and 5 weeks in the programme, results appeared to be ambiguous, because of her unreliable self-monitoring. Even though, frequency of exercise, and wearing diabetic identification improved, the absence of self-monitoring of some weeks and of follow up weeks, make the conclusions risky. In conclusion this research claimed highly positive results for exercise participation, however, the small sample is an important limitation.

Another study that examined the relationship between goal-setting and exercise adherence, was the one done by Poag and McAuley(1992). This study was conducted on healthy adults, and had a specific focus on the subjects' self-efficacy, and how this could determine adherence, through goal-setting techniques. Seventy-six adult females (M age = 52 years), with most of them having previous exercise experience, participated in the study. The participants exercised in local programmes, which lasted 8 to 10 weeks, were conducted three times per week, and were approximately 50 minutes long. Before the programme started, all members completed an inventory, in order to assess their exercise history, exercise participation goals, and possible barriers to achieve the beforementioned goals. Most of the recorded goals, where about physical fitness benefits (31%) and weight loss (25%),

however, the scientists concluded in five major types of goals. The subjects were asked to rate these goals by importance and then completed a 100-point scale of how confident they were to reach each goal. This information produced the goal-efficacy variable. The subjects were also asked to rate the importance of regular exercise, in order to achieve the desired goals, and these data produced the variable exercise efficacy, which expressed the subjects' perceived confidence of abilities to exercise regularly, despite the possible obstacles. In the end of the programme the subjects completed measures about how successfully did they achieve their goals, and how often they attended exercise classes. The results indicated that exercise efficacy did not predict exercise frequency, but predicted exercise intensity. Goal efficacy was positively related to perceived goal achievement. Lastly and more importantly, the results indicated that self-efficacy could not predict frequency of attendance. The authors explained their results, based on their biggest limitation; most of the participants were regular exercisers before the programme, thus the goal-setting influence could be minimum because of that. More importantly, there was no guidance at all when it comes to goal-setting, and the subject had to work with their goals by their own. As the authors mention, their goals were too general, possibly meaning that they did not follow the structure of S.M.A.R.T. So, the study might have needed an intervention concerning the assistance of the sample with the technique.

Scherzer, Brewer, Cornelius, et al., (2001) studied the effect of psychological skills on patients' adherence to rehabilitation, after having reconstruction of anterior cruciate ligament. In this study participants were 54 patients rehabilitating in a physical therapy clinic after anterior-cruciate-ligament reconstruction, who took part in a 30-week programme. The patients worked with the skills of goal-setting, imagery and positive self-talk. Adherence to rehabilitation was assessed with attendance at

rehabilitation sessions, with rating how much of their prescribed home rehabilitation exercises and home cryotherapy they had completed during the previous week, and with the use of the Sport Injury Rehabilitation Adherence Scale. As for the goal-setting technique concerned, results showed that it was a significant predictor of home exercise completion, and a significant predictor of Sport Injury Rehabilitation Adherence Scale ratings. However, neither home cryotherapy completion nor attendance was predicted by use of goal setting. Based on participants' self-reports, goal-setting was associated with home and clinic-based measures of adherence to a postsurgical sport-injury-rehabilitation programme, which shows the beneficial character of the technique.

Annesi (2002) used a goal-setting protocol to investigate its effect on exercise adherence on Italian adults. The sample was parted of 15 men and 35 women in the goal-setting group, and 16 men and 34 women in the control group. The participants were 20-60 years old and were not regular exercisers. The researcher gathered data from the gym's electronic files, for the frequency of the exercise of participants, for 52 weeks. Even though all participants, visited an exercise professional, every 6 weeks, for 40minutes, the control group meetings were focused on the transfer of physiological knowledge, whereas the interventional group meetings were focused on implementing a goal-setting protocol. Goals, in the protocol, could be related to exercise duration, intensity, frequency, or improvement in a chosen outcome measure, and the participants completed regularly a self-monitoring form about exercise outputs. The results did not show significant differences between men and women for either attendance, or dropout. The goal-setting group showed significantly higher attendance and significantly lower dropout, than the control group. This research did

eventually conclude in the positive effects of the technique in exercise adherence after a long period of time.

A similar study was conducted by Wilson and Brookfield (2009). They implemented a process and outcome goal-setting intervention in order to find out the possible changes in exercisers' adherence. Sixty recreational exercisers (33 males and 27 females) volunteered to participate in the six-week exercise programme. Fifteen participants were assigned to the process goal group, 15 to the outcome goal group, and 30 to the control group. The intervention lasted 6 weeks and all subjects were previous active exercisers. The researchers measured participants' motivation with the Intrinsic Motivation Inventory, and adherence through the gym's records, for the 6 weeks of the programme, after 3 months and after 6 months of completion. The results showed that the two intervention groups had greater attendance than the control group, during the six-week programme, however between the two groups was no significant difference. Three and six months after the intervention ended, the process group had greater adherence from both the outcome-goal group and the control group, with control and outcome groups having no significant differences. This study showed that both process and outcome goals can increase frequency of attendance, although process goals can help the exerciser maintain adherence after long-term periods of time.

Bycura (2009), applied a 7-week goal-setting intervention, in college undergraduate students. The 84 participants were randomly assigned in three groups; control group, goal commitment goal, and implementation intention plan group. The goal commitment group was committed to a goal, and exercised 3 times every week, for 20-60 minutes, in order to achieve the goal. The

implementation intention plan group was committed to the same goal, as goal commitment goal was, but in addition, they made a plan in order to reach the goal. In Time 2 (the fourth week) of the programme, the researcher informed the participants that they need not have to follow their routine, as for exercise and goal-setting concerned. In Time 3, the researcher asked the participants about their frequency of adherence and use of the technique. The results showed that all groups decreased in levels of exercise attendance, with no significant difference between the groups. The goal group had significantly decreased its training days from time 2 to time 3, and also reported significantly higher levels of introjected regulation, in the same period. These results appeared to be different to that of previous studies, urging the authors to suggest that goals probably needed more autonomy support.

Tierney et al. (2012) reviewed studies testing strategies that effect exercise adherence, in people with heart failure. The total number of participants enrolled on the 11 selected studies, was 3,231. In most studies (except one), goal-setting was used as a technique to increase adherence. Other techniques used were problem solving, ongoing support, and feedback for positive reinforcement. The results suggested that short-term positive outcomes were associated with strategies such as goal setting, which can also provide development of ones' self-efficacy. However, longer-term maintenance of exercise was less successful. The most important limitation of this review is that they did not study the effect of goal-setting on adherence separately, so the technique might have had an effect in combination with other motivational techniques. Also, the variety of studies was large (from method, to measures), so comparisons were not an easy task.

Coppack, Kristensen and Karageorghis (2013) used a goal-setting intervention to increase the adherence of people rehabilitating from low back pain. In the study

participants were 48 patients from the UK Defence Medical Rehabilitation Centre (DMRC). The method included a 3-week programme, during which participants should attend 5 sessions per week. The sample was divided in three groups; experimental group (goal-setting and exercise therapy), control group 1 (C1: therapist-led exercise therapy), and control group 2 (C2: non-therapist-led exercise therapy). The experimental group, followed the standard exercise programme, but also applied the technique of goal-setting. The C1 group completed the standard exercise programme, as C2 group also did, but the difference between these two groups is that the C1 participants received verbal encouragement as motivation, from the therapist. The researchers measured adherence to rehabilitation, self-efficacy and treatment efficacy, treatment outcome, and behavioral regulations. The results showed that the experimental group had significantly higher adherence, compared to control 2 group. However, no significant difference in adherence was found between intervention and C1 group. These results indicate that the high levels of adherence of the experimental group and C1 group, may not have been caused by goal-setting, but they could be probably caused by the positive reinforcement of the therapist. So, the results of the study seem rather, ambivalent, about the real effect of the technique.

Cobb, Stone, Anonsen and Klein (2013) published a goal-setting intervention, to examine the possible effects on adherence of college students. The 104 participants of this study, registered in a college gym, for 16 weeks. The sample was divided in three groups; a goal-setting, a reading, and a control group. All groups participated in exercise programmes with an experienced trainer. The goal-setting group worked the technique with the investigators, whom they helped the participants set process and product goals, helped them achieve them, and feedback them with encouragement. The reading group read articles that the investigators gave them, which referred to

health and fitness. In the end of the intervention, no significant differences, between the 3 groups, was found, even though 60% of the goal-setting group participants reported that the technique helped them maintain adherence. These results are similar to some of the beforementioned studies. As motivation to participate in the study, students received an incentive of 4 clock hours toward credit or letter grade. The authors indicated that results may not have concluded in favor of the technique, because they provided the students with the external motivation of ‘increasing their grade’.

Morgan et al. (2014) run a 3-month intervention in order to increase the exercise adherence, and thus weight loss, of obese adults, through the use of Social Cognitive Theory-based tasks. All participants of the study were overweight or obese male adults, and they were divided in 3 groups (two of which were experimental and named ‘SHED-IT’, from the acronyms of the intervention); SHED-IT resources, SHED-IT online, and a wait list control group. Both SHED-IT groups, had as purpose to be educated about the benefits of losing weight, by increasing exercising and balanced diet. All participants learned self-regulatory techniques, like goal-setting, self-monitoring and reward provision, in order to increase their self-efficacy and sustain in the recommended behaviors over time. The SHED-IT intervention group was given a handbook, manual and DVD, especially designed for this study, which mainly promoted increasing exercise and healthy nutrition. Participants recorded their progress and were also asked to set 3 SMART goals monthly, one for weight loss, one for physical activity and one for dietary intake. The participants also noted down the successful goals, and in the end of the month received a reward, if they had achieved all 3 goals. On SHED-IT online group, participants were advised to use an Australian website which provided users with dietary and exercise advise. The researchers

measured body weight and body mass index, as well as participants adherence and compliance through the handbooks. Six months after the intervention both intervention groups reduced significantly their weight in comparison to the control group, with no significant differences between the SHED-IT groups. Both SHED-IT groups significantly decrease energy intake, and increased physical exercise. Half of the SHED-IT resources participants claimed to have used goal-setting, with more than half of whom achieving all 3 goals. It appears that, from all the SCT-based tasks, the most productive were goal-setting and self-monitoring. Yet, the online control group had equally significant results, the intervention used more techniques than goal-setting, and half of the participants on the resources group did not use goals, so the results are not completely clear in the end.

Recently, a meta-analysis was conducted by Burgess, Hassmén, Welvaert, and Pumpa (2016). The authors searched for studies which used behavioral treatment strategies in order to improve obese adults' adherence in intervention programmes. This meta-analysis included data from 9 articles, with 12 interventions. The interventions included strategies such as motivational interviewing, goal setting, self-monitoring, problem solving, stimulus control, relapse prevention, behavioral contracting, dissociation, cognitive restructuring and self-reinforcement. Overall, the results of this meta-analysis indicated that behavioral treatment strategies have a significantly positive effect on exercise adherence for obese adults. Although this is the first paper of its kind, it provided valuable knowledge on the matter. Nonetheless, it is hard to understand whether goal-setting by itself, or as a whole, combined with other strategies, positively affected the sample.

Importance and purpose of the study

Even though physical activity and exercise have been well-established in the literature, as for the physical and mental benefits concerned (U.S. Department of Health and Human Services, 1996), it has been found that over 50% of those initiating to exercise, will drop out after the first six months of registration (Dishman, 1988; Berger, Pargman, & Weinberg, 2002). Studies (e.g., Phillips, Schnider, & Mercer, 2004) pointed some of the reasons that possibly raise the exercise dropout rate, for example failure, lack of improvement, or changes in motivation. As mentioned before, goal-setting is a beneficial technique within exercise settings, which enhances motivation and regulates behavior (Locke & Latham, 1985). For, this reason, it is important to use this tool, in order to assist the exercisers to participate more regularly in organized programmes and maintain adherence in high levels, after long periods of time. By doing this, the participants will enhance their quality of life and well-being (Edmunds, Ntoumanis & Duda, 2007).

Towards this direction the present study aimed at exploring the effectiveness of a goal-setting intervention on frequency of participation among women participating in organized exercise programmes. To strengthen the potential impact the intervention aimed at promoting the satisfaction of the three basic needs through a weekly consultation offered to participants. In these sessions participants would (a) have the chance to discuss and set goals for themselves to develop a sense of autonomy; (b) would evaluate goal attainment with the consultant to increase competence; and (c) would receive support and reinforcement, which in addition to (a) and (b) would increase relatedness. To evaluate the retention of the potential effects the frequency of participation was recorded from 4 weeks prior to the onset of the intervention to 4 weeks after its completion. It was expected that the intervention would increase frequency of participation and at the same time need satisfaction. ,

Method

Participants

In this study 64 female exercisers of a private fitness club volunteered to participate. The participants were between 26-50 years old (Mage = 38.0), and had been members of the club for at least one month, before the onset of the intervention. The fitness club that the participants were chosen from, provided several services, and for reasons of reliability of the research, only participants of the 'gold-services programme' (all inclusive, for more than 6 months of registration) have been accepted. This was decided so that participants would have 'non-limited' access to any exercise programme the fitness club was offering, and would have the ability and choice to participate in whichever programme they enjoy. All participants signed a concern form, and were informed that they could leave the programme at any time, if they wanted to. The sample, was divided into two groups, experimental (n= 31) and control (n= 33).

Procedure

The study was approved by the ethics committee of the University of Thessaly. Subsequently, the owners of the fitness club were informed and approved the implementation of the intervention in the facilities of the gym. Participants were assigned into experimental and control groups. All participants were informed that the frequency of their participation will be recorded for the following 8 weeks. Participants of the experimental group were also informed that during this period they would have to attend six face-to-face one-hour meetings with the researcher, who had been member of the fitness club staff for one and a half years. A goal-setting intervention was implemented to the experimental group. The duration of the intervention was 8 weeks. Before the onset and upon completion of the intervention,

participants of both groups completed measures assessing the satisfaction of basic needs. Participants' frequency of participation in exercise programmes was recorded and retrieved from the administration of the fitness club for one month before the onset of the intervention, during, and for one month following the completion of the intervention.

Goal-setting intervention

In the first session, a discussion about the benefits of regular exercise, and how goal-setting can assist in that, took place. Then, each participant was given 3 goal-setting tables (see '**Appendix**'). The first, was about reporting in four columns: 1) general (outcome) goals, 2) how could they possibly succeed them, 3) which could be the possible barriers, and 4) how could they possibly overcome these barriers (Theodorakis & Goudas, 2002). The purpose of this table was to help the participants think about their goals and the reasons why they exercise, in order to have a clear view and come more focused and prepared on their trainings. What is more, the table provided them with the opportunity to find the ways that each goal could be achieved, and thus create an exercising plan. Lastly, it was supposed to help them create an additional 'Plan B', in the case of meeting obstacles in achieving their goals. In this way, if a barrier occurred, instead of giving up or quitting, they will be able to continue (Bray, 2013), as they would have figured out beforehand a way to overcome it. The second was a weekly table (Theodorakis & Goudas, 2002), that required to write down the everyday goals been set (Monday-Sunday), the process been followed to achieve the goals, as well as an evaluation of the process and personal comments (as notes for next time's effort). The purpose of the second table, was to help the participant keep a record of the goals she achieved, or not, and document why and how this happen. This is important because it provides a visualization of the progress

made, or not, and helps the participant continue with progress, or try alternative ways to achieve goals, which were not achieved until then. The third table had two parts; part one was an hourly-weekly-schedule table, and part two was a 'commitment contract'. The purpose of the third table was to help the participant set attendance and alternative attendance goals (in case she missed one or more of the original trainings). It also helps the exercisers who complain about not having time to exercise more, organize their free time more efficiently, by providing alternative days or hours for training, and thus increase adherence (Theodorakis, 2010). The second part of the 'commitment contract', was a method to increase the participants' commitment towards important others (counselor, family or friends), but most importantly towards themselves. After, the tables were given, it was explained how they work, how they can set S.M.A.R.T. goals, and which are the possible benefits of the technique. Also, the participant was asked to propose few example, for better understanding of the technique.

In the second meeting, we examined how close to the S.M.A.R.T. guide did the participants complete the tables, and if they succeeded in the weekly attendance goal. The same, procedure has been followed for the two months of the intervention. In each session, we discussed about the goals that were or were not succeeded, how did the goals where achieved, if they were not successful which were the probable reasons why this happened, and what other strategies could be followed towards success, how each participant evaluates every week's progress, how did the interaction with their trainer have been, etc.

Measures

Basic Need Satisfaction

The Basic Psychological Needs in Exercise Scale (BPNES: Vlachopoulos & Michailidou, 2006) was used to evaluate the satisfaction of the psychological needs for autonomy, competence and relatedness of participants in the exercise. This questionnaire consists of 12 subjects, divided into three sub-scales with four subjects per sub-scale. Autonomy (4 questions, eg "the way I practice is totally in agreement with my choices and interests"), competence (4 questions, eg "I think I do well in this exercise program") and relatedness (4 questions, eg "My relationship with my companion is too friendly"). Responses were given in a Likert type five-step scale (1 = completely disagree, 5 = totally agree)

Social Validation

In the final assessment participants of the intervention group were asked to respond two questions on a 10-point Linkert scale (1-10): first, how regularly they set goals for the frequency, duration and intensity of exercise; second, as how helpful they found the goal-setting intervention for maintaining or increasing their frequency of participation.

Reasons for Exclusion

All the participants should complete the before mentioned measurements before and after the intervention. If any participant did not successfully complete them, she was excluded from the study. Also, the intervention group should participate in 6 personal sessions, during the 2-month study. So, participants attending less than 50% of the sessions in total (less than 3) was also excluded.

Results

However, not all participants completed the final measures, as well as participants of the experimental group did not meet all the criteria for completing the programme (see '**Reasons for Exclusion**'). Thus, because of dropouts and exclusions,

the final number of participants was 17 for the intervention group and 19 for the control group. From the intervention group, 5 participants dropped out and 9 did not reach the session threshold. In addition, from the control group, 3 participants dropped out and 11 did not show up for the end of intervention questionnaire.

Baseline comparisons

T-test was calculated to test for differences in frequency of participation for the baseline month between the two groups. The analysis showed no significant differences between the two groups, $t(34) = 0.26$, $p = .80$.

One-way MANOVA was calculated to test for differences in basic need satisfaction at baseline between the two groups. The analysis showed a non-significant multivariate effect, $F(3, 32) = 1.25$, $p = .31$. Examination of the univariate effects showed that there was no difference in any of the three dimensions of needs; for competence, $F(1, 36) = 1.29$, $p = .26$, for relatedness, $F(1, 36) = 3.69$, $p = .06$, for autonomy, $F(1, 36) = 2.73$, $p = .11$.

Hypothesis testing

Frequency of Participation

Two-way ANOVA with one repeated factor (4 levels: 4 groups of 4 weeks each; W-0-W4, W1-W4, W5-W8, W9-W12) and one independent factor (group: control, experimental) was calculated to test for differences in frequency of participation as a function of time and group. The analysis showed a significant group by time interaction, $F(3, 32) = 7.05$, $p < .01$. Examination of the pairwise comparisons per time showed that: (a) for the experimental group, frequency increased from W-4-W0 to W1-W4 ($p < .05$), remained stable from W1-W4 to W5-W8 ($p = .40$), and decreased from W5-W8 to W9-W12 ($p < .01$); (b) for the control group, frequency decreased from W-4-W0 to W1-W4 ($p < .01$), remained stable from W1-W4 to W5-W8

($p = .35$), and from W5-8 to W9-12 ($p = .67$). Examination of the pairwise comparisons per group showed that there were significant differences between the two groups in W1-4 ($p < .01$) and W5-8 ($p < .05$), with the experimental group scoring higher than the control, but not in W9-12 ($p = .51$). The mean scores for frequency of participation for the two groups across time are displayed in Figure 1.

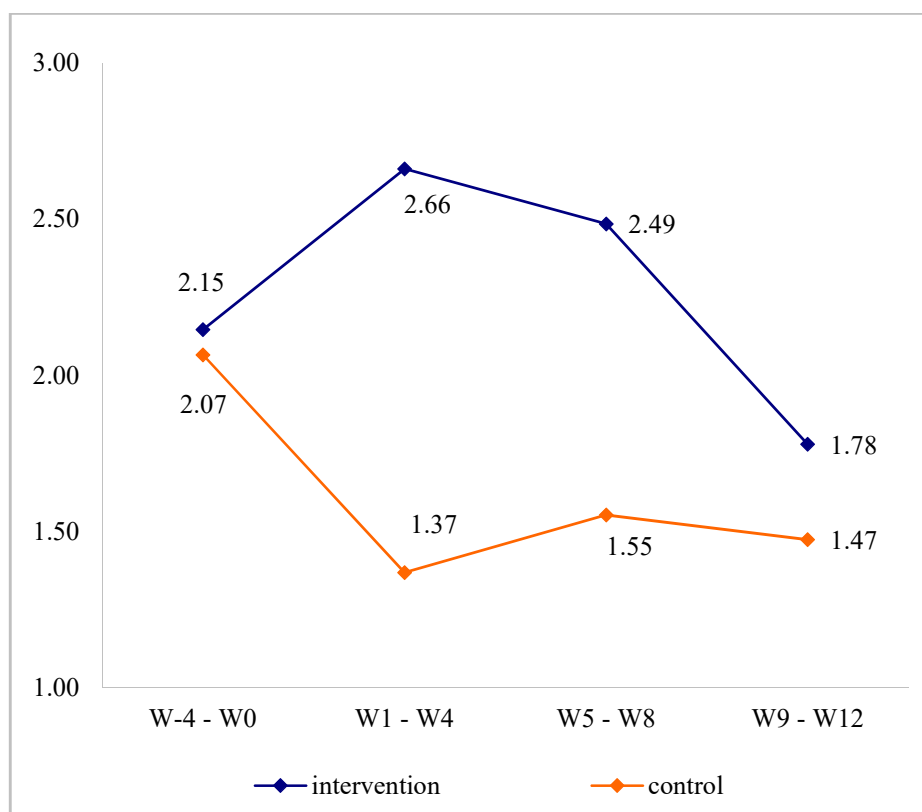


Figure 1. Changes in frequency of participation across time for the two groups

Basic Needs Satisfaction

Two-way MANOVA with one repeated factor (2 levels: pre-, post-intervention) and one independent factor (group: control, experimental) was calculated to test for differences in satisfaction of basic needs as a function of time and group. The analysis showed a non-significant group by time multivariate interaction, $F(3, 32) = 2.05$, $p = .13$; however, examination of the univariate effects showed significant differences for competence, and autonomy. Considering the

considerable effect size, the pairwise comparisons were subsequently examined. For competence, it was revealed that scores for the experimental group increased ($p = .05$), whereas those of the control group remained unchanged ($p = .38$). For autonomy, it was revealed that scores of the control group decreased ($p < .05$), whereas those of the experimental group did not change significantly ($p = .56$). The mean scores for the satisfaction of basic needs for the two groups before and after the intervention are displayed in Table 1.

Table 1. Descriptive statistics for basic needs satisfaction per group.

	Experimental				Control			
	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
Competence	3.57	0.64	3.82	0.64	3.80	0.56	3.69	0.62
Relatedness	4.13	0.64	4.22	0.72	4.47	0.40	4.22	0.62
Autonomy	4.13	0.49	4.20	0.70	4.39	0.45	4.10	0.60

Social Validation

Upon completion of the intervention, participants of the intervention group reported consistent use of goal setting throughout the programme ($M = 7.82$, $SD = 1.59$) and acknowledged that goal setting helped them maintain or increase the frequency of their participation in exercise programmes ($M = 8.35$, $SD = 1.73$).

Discussion

The purpose of this study was to examine the effect of an eight-week goal-setting intervention on exercise participation. It was also examined whether this programme could affect the satisfaction of the three basic needs; autonomy,

competence and relatedness. Based on the Self-Determination theory of Deci and Ryan (1985, 2000) it was hypothesized that the intervention including face-to-face consultation for goal-setting would increase the participants' adherence, and this increase would probably have occurred by the increase of the levels of satisfaction of the basic psychological skills (Markland, 1999).

The results showed that during the intervention the experimental group, in contrast to the control group, significantly increased the frequency of their visits to the fitness club compared to the four weeks prior to the intervention. Whereas the increase for the intervention group can be attributed to the goal-setting consultation, the decrease of the control group can be attributed to the Easter holiday period which fall within the intervention. This makes the effect for the intervention group even more impressive, as typically over the Easter holiday visits of gym clients typically drop, but also because the gyms close for a period of 4 days.

Upon completion of the intervention and for the month that followed frequency of participation for the intervention group decreased significantly. This was in contrast to our objectives, we originally it was hypothesized that the consultation would have a longer-term effect to participants due to its educational character with regard to the use and effectiveness of goal-setting. In a follow-up inquiry with several participants the decreased was attribute to personal reasons, some of which correspond to usual barriers, such as time constraints, individuals report for the lack of physical activity (Mazzola, Moore & Alexander, 2017; Nichols et al., 2017; Scorrano, Ntsiea & Maleka, 2018). Thus, despite the effectiveness during its implementation, the intervention failed to achieve a sustained effect on frequency of participation. A possible reason for that may be the prior experience of participants and the relatively high and stable participation rates even from the beginning of the

research. Simply put, an already long-term exerciser may not be able to increase considerably for long periods of time. This conclusion has been also drawn from other researcher working with long-term active exercisers or with exercisers with previous experience (Poag & McAuley, 1992). In addition to that, it may be that a 6-session intervention was not enough for participants to master and fully exploit the goal-setting strategy. This is something that was noticed from the consultant during the process as until session three most of the participants were still trying to learn the technique, and spent more time on that, rather than the practical implication. Similar studies have also failed to achieve long-term effect of goal-setting in exercise participation, and maybe the similarity of short-time intervention could be the reason (Bycura 2009; Tierney et al., 2012).

An important and relatively novel aspect of this intervention was the examination of the effects of goal-setting on basic needs satisfaction. The literature has established that satisfaction of basic need can help initiate and increase adherence in exercise (Edmunds, Ntoumanis & Duda, 2008; Silva, Markland, et al. 2011). In addition to that, it has been also established that goal-setting can increase the satisfaction levels of basic needs. Especially, the need of competence can be satisfied due to achieved process goals, making the exerciser feel more competent, and thus physically active (Field & Steinhardt, 1992; Biddle 1995; Wilson & Brookfield, 2009). The results showed that at completion of the intervention satisfaction for the need for competence had increased significantly. Goal setting has proven effective in developing self-efficacy and a more general sense of competence in beginner exercisers (Markland, 1999; Dawson & Brawley, 2000; Moreno, 2010; Tierney et al., 2012). Over and above, the intervention seemed to work equally for non-beginners. In particular, during the consultation several participants reported that were experiencing

lack of progress. This was partly attributed to their long-term adherence to the programme they were attending, and the lack of motivation or strategies to further improve. Thus, the goal-setting consultation succeeded in developing a sense of competence even for experienced more active clients.

For the needs of autonomy and relatedness the increase was not significant for the experimental group, whereas decreases in autonomy were reported for the control group. Even though our hypothesis was that the consultation would increase autonomy due to the development of independent goal-setting skills, this was not evidenced at the completion of the intervention. This finding also complies with the lack of follow-up effect on frequency of participation. Similarly, according to the hypotheses we expected that relatedness would increase due to the contact with the consultant but this was also not confirmed. These findings could be possibly attributed to the structure of other exercise programmes participants attended and their interaction with other trainers in the gym. Furthermore, with regard to autonomy, participants verbally reported that in their gym experience they were mostly used to be fully guided by the expert trainers, as authorities on the matter (Lacewing, 2008), thus having no space and subsequently lack of skills for independent practice.

Limitations and conclusion

Certain limitations of this research should be considered. Most importantly, the relatively high drop-out rate that resulted in a rather limited sample. Despite that originally a satisfactory number of clients offered to participate, many of them failed to present themselves when the programme began. Furthermore, upon completion of the intervention period a number of participants from the control group did not reply to calls for completing the post-intervention assessment. This may actually suggest that the intervention was more successful than the evidence suggests, if these

participants had actually dropped-out of the fitness club. In any case, future studies employing larger samples and more effective monitoring of participants will help shedding more light on the effectiveness of goal-setting consultation interventions.

A second limitation that should be noticed is that the researcher was also the counselor of the experimental group. This could be a reason to affect the study's reliability, because of subject or observer-expectancy effect. In other words, the participants may have expected a given result and therefore unconsciously affect the outcome, or report the expected result. On the other hand, the researcher may have subconsciously influence the participants of an experiment. However, it was vital for the study that the researcher is also the consultant because this would facilitate the recruitment of participants and their adherence to the intervention. Employing a third person as consultant would have also raised difficulties getting the consensus of the fitness club owners.

Despite the above limitations the study provides valuable evidence with regard to the effect of goal-setting consultation on exercise participation and need satisfaction in exercisers with established records of exercise participation in organized programmes. In particular, the findings showed that frequency of exercise increased during the duration of the intervention and this was accompanied by an increase for the satisfaction of the need for competence, that may actually explain the increase in frequency; nevertheless, the frequency dropped back to pre-intervention levels upon completion of the intervention and this may be attributed to the lack of increase for the satisfaction of the need for autonomy. All in all, future research is warranted to enhance our understanding of strategies to increase exercise participation in organized programmes; nonetheless, the consistent presence of an exercise

psychology expert in fitness clubs appears as a promising endeavor towards this direction.

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<https://www.cdc.gov>

<http://www.who.int>

Appendix

Materials used for the study

Which is my goal?	What can I do to succeed it?	What could be a possible barrier?	How can I overcome this barrier?

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Goal of the day							
Procedure to achieve it							
Evaluation							
Comments							

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8-9							
9-10							
10-11							
11-12							
12-13							
13-14							
...							

COMMITMENT CONTRACT

I have decided to exercise for.....times/week.

I am ready to do this.

I commit I will do this.

The date I start is.....

I will continue to exercise with this commitment until.....

Signature _____ Date _____

I will show this contract to a person I appreciate. This person

is.....