



Basic Psychological Needs in Exercise Among Adult Exercisers

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ABSTRACT

This study aimed to examine the basic psychological needs in exercise among adult exercisers regarding gender, type of exercise, age groups, and years of exercise. The Basic Psychological Needs in Exercise Scale was administered to 234 adult exercisers ($M_{age}=25.11$, $SD = 8.89$ years). The participants were classified into two age groups (18-29 and 30-45 years) and three groups based on years participating in exercise programs (6 months to less than one year, 1-3 years, and more than three years) and three types of exercise groups (individual, group, and both). We found statistically significant gender and age group differences on the relatedness subscale ($p<0.01$). Female and in 30-45 age group exercisers had higher relatedness scores than those in the 18-29 age group and male exercisers. We also found statistically significant differences between groups of exercise types in all subscales ($p<0.01$). PostHoc comparisons revealed that exercisers participating in individual plus group exercises had significantly higher scores in all subscales than those participating only in individual or group exercises. Furthermore, significant differences regarding the years of participating were found in all subscales ($p<0.01$). Post hoc group (6 months to less than one year, 1-3 years, and more than three years) comparisons showed that participants exercising for six months to less than one year had lower scores. It was concluded that female and younger exercisers satisfied more relatedness needs in exercise. In addition, it has been noted that the type of exercise and longer-term participation are significant factors in meeting psychological needs during exercise.

INTRODUCTION

The physical and psychological benefits of regular exercising have been studied extensively (Akyol et al., 2008; Paluska & Schwenk, 2000; Penedo & Dahn, 2005). Because society in general has become inactive and sedentary with the effect of technological developments (Proper et al., 2011; Corder et al., 2019), the results of studies on the benefits of physical activity are now more important (Gür & Küçüköğlü, 1992; Reis et al., 2000). Due to the physical, psychological, and social positive effects of regular exercise, increasing physical activity in the general public has been among the primary goals of public health in many developed countries (Caspersen et al., 2000). The state of being physically inactive in adolescence (Ekblom et al., 2018) may also manifest itself in adulthood (Kumar et al., 2015). The physical and psychological benefits provided by exercise are associated with individuals' well-being and social needs. (Wilson et al., 2006). From this vantage point, the value of the "need" issue, which has been on the agenda of researchers for a long time, has been better understood. In physically inactive individuals, it is thought that psychological problems will be added to the physiological problems that may occur due to physical inactivity, with the effect of social factors, including motivating behaviors (or lack thereof). In this case, the psychological needs that affect the individuals' behaviors also gain importance in exercise behaviors (Vallerand, 2001).

Self-Determination Theory (SDT) examines the goals and desires of individuals in two main categories: intrinsic and extrinsic motivation. While making these definitions, Self-Determination Theory (SDT) is considered a meta-theory, also draws upon and relates to micro theories such as Cognitive Evaluation Theory, Organismic Integration Theory, Causality Orientation Theory, Goal Contents Theory, and Basic Psychological Needs Theory, emphasizing their interconnectedness (Ryan & Deci, 2000). In this study, the assessment of the needs of regular exercisers is attempted to be explained within the framework of SDT, focusing on the theory of Basic Psychological Needs in Exercise. The basic psychological needs that regulate the interaction of individuals with each other in daily life become essential in terms of determining, implementing, and achieving results (Deci & Ryan, 2000). SDT emphasizes that individuals must meet their basic psychological needs for healthy development. According to the theory, three needs in particular are fundamental: autonomy, competence, and relatedness (Ryan & Deci, 2020). The need for autonomy is defined as the individuals' feeling of independence in determining their goals and the feeling of freedom in their behaviors. It expresses the desire to act in activities of one's choosing and to be the source of

one's behavior (Ryan & Deci, 2020). The need for competence expresses the belief that an individual will achieve their purpose and confidence in their capacity to exist in society. It is also defined as the desire of individuals to interact efficiently with the environment, to experience a sense of competence in producing desired results, and to prevent undesirable events (Edmunds et al., 2006). The third need, relatedness, is the feeling of being connected to the people with whom individuals interact in their social lives and belonging to the environment in which this interaction takes place (Vlachopoulos & Michailidou, 2006). In other words, it includes a sense of connectedness or belonging to a particular social circle (Edmunds et al., 2006). The inhibition of these three needs is seen as detrimental to motivation and wellness (Ryan & Deci, 2020). Self-determination theory proposes that when needs are met, the most self-determined forms of regulations will lead to behavior. In contrast, low self-determination results from blocking these three basic needs (Edmunds et al., 2006).

Using SDT as a guide, the importance of "interpersonal support resources" that can play an essential role in basic psychological need fulfillment has been emphasized. They are autonomy support, structure, and involvement. Autonomy support embodies teaching methods (for example, being empathetic and encouraging) designed to identify and enhance psychological needs by prioritizing the person's values and interests. The amount and clarity of information that the others supply to support the desired goals are referred to as their structure. Involvement is an interpersonal support that can be achieved through warmth, participation, unconditional interest, and the ability to empathize with and respond effectively to the unpleasant feelings of others (Mack et al., 2017). In other words, it can also be explained as the ability to accept the difficulties encountered in situations such as performing sports and to show genuine interest in an individual's well-being (Wilson et al., 2009). The proposition that these interpersonal supports are related to meeting basic psychological needs has been supported by studies conducted in the context of exercise (Mack et al., 2017). From this perspective, it is thought that the interpersonal support of the participants in the group and individual exercise programs may differ in the exercise environment. Therefore, there may be differences in fulfillment of their basic psychological needs. In addition, relatedness, one of the basic psychological needs, is the sense of establishing a meaningful bond with other people in the individual's social environment (Wilson et al., 2007). In other words, people need to experience the feeling of bonding with others and belonging (Mehra et al., 2016). In this context, it is thought that the concept of meeting this need may differ between those participating in group exercise programs and those participating in individual exercise programs. For example, exercising with peers can motivate them to continue the exercise

program (Mehra et al., 2016). The varying results in exercise experience in the conducted studies have emphasized the necessity of contributing results to the literature regarding the needs and duration of exercise participation. In Güler's (2020) study, no significant difference was found in exercise experience, while Kaşka (2022) concluded that different exercise experiences have different needs. In addition, research exercises research in the literature has shown that basic psychological needs are not adequately addressed in terms of variables such as the type of individual or group activities of exercise programs and the period of exercise participation. For these reasons, main objective of this study was to examine the basic psychological needs of the participants who exercise regularly in relation to the type and period of exercise participation.

Many studies have examined fulfillment of the basic psychological needs in exercise via different variables. Reis et al. (2000) reported that the needs for autonomy, competence, and relatedness were significantly related to well-being and that satisfying these needs positively affected people's well-being. Kirkland et al. (2011) examined the connection between motivation, meeting basic psychological needs, and exercise in older adults and found that individuals who exercised had higher scores in meeting their needs for relatedness, competence, and autonomy than those who did not (Kirkland et al., 2011). Vlachopoulos et al. further supported this theory with cross-cultural studies (Vlachopoulos et al., 2011; 2013). Edmunds et al. (2006) examined the relationship between basic psychological needs in exercise and exercise behavior and reported significant statistical results supporting SDT. Goulimaris et al. (2014) investigated the connection between psychological well-being and basic psychological needs in exercise in adults who participated in recreational activities. They concluded that well-being in individuals who exercised was positively concerning the fulfillment of three basic psychological needs. Edmunds et al. (2007) conducted a study on overweight/obese individuals who took part in a 3-month exercise program and concluded that an improvement in the satisfaction of competence and relatedness needs increased commitment to the program more over time. Increases in general need satisfaction experienced during the program positively predicted self-determination motives in participation in physical exercise. In a study conducted by Martinez et al. (2013) on individuals participating in exercise programs at sports centers, it was found that the psychological need for competence was effective in females' exercise participation, while it did not affect men's exercise participation.

It has been reported that there are gender differences in the satisfaction of basic psychological needs in different age groups. For example, Molix and Nichols (2013) studied

individuals aged 20-81 years and found that females' levels of competence and relatedness satisfaction were higher than their male counterparts. Navarro-Patón et al. (2018) examined the satisfaction of basic psychological needs in physical education classes in students aged 10-17 years and found that male students' satisfaction levels in three basic needs were higher than those of female students. In Güler's (2020) study, it was found that male participants had higher need scores, whereas Ekiz and Sezgin (2021) concluded that female participants had higher scores. In terms of results, Kaşka's (2022) and Güler's (2020) studies also differ. Kaşka (2022) did not find significant differences among age groups, while Güler (2020) concluded that there were different needs in different age groups. As can be seen, different results were obtained in different age groups. In addition, there are few studies on whether there is a change in the satisfaction of basic psychological needs in the exercise environment according to gender and age. A recent study stated that examining basic psychological needs in relation to age, gender, and a different kind of exercise would help them understand the topic better (Kazak, 2018). For these reasons, this study's secondary aim was to examine the basic psychological needs of the participants who exercise regularly in relation to gender and age groups.

METHODS

Research design

In this study, a quantitative research design, specifically a descriptive research model, has been utilized. These studies aim to collect and analyze data to determine the specific characteristics of a group and reach a conclusion (Büyüköztürk et al., 2012).

Study Group

A total of 234 individuals, 111 females (mean age 27.5 years; SD = 9.42 years) and 123 males (mean age 22.94 years; SD = 7.82 years), who engaged in regular exercise programs in sports centers in Kırıkkale participated in this study. The study's sample size was calculated with power analysis as 207 adult exercisers, considering that the parameters for α and β were 0.05 and 0.90, respectively. In light of this, participants were recruited using the convenience sampling technique. Participants who complied with the requirements to participate in an exercise program 1-3 times a week for at least six months were eligible to participate in this study. The exercise type categorizations (group and individual exercise programs) were presented to the participants as options in the personal information form. Additionally, they were instructed to write down the specific groups or individual activities they participated in.

The exercise programs were grouped as they were conducted in the sports centers where the study was carried out. Demographic information of the participants is presented in Table 1.

Table 1
Demographic Characteristics of the Sample

Demographic variables		f	%
Gender	Female	111	47.4
	Male	123	52.6
Age Groups	18-29	157	67.1
	30-45	43	18.4
Participation period in exercise	Six months - < 1 year	91	38.9
	1-3 years	58	24.8
	> 3 years	85	36.3
Type of exercise	Group	51	21.8
	Individual	142	60.7
	Group + Individual	41	17.5

Data Collection Tools

Demographic Information Form: This form was used to obtain information such as the demographic characteristics of the participants, the type of exercise they attended, and the participation period.

The Basic Psychological Needs in Exercise Scale (BPNES): The BPNES was developed by Vlachopoulos and Michailidio (2006) and consists of 12 items in three subscales: Competence (items 1, 4, 7, and 10), Autonomy (items 3, 6, 9, and 12), and Relatedness (items 2, 5, 8 and 11). Each item was evaluated on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). The validity and reliability of the Turkish version of BPNES were undertaken by Vlachopoulos et al. (2013). The goodness of fit index values of the Turkish version of the BPNES were found to be acceptable levels (Satorra-Bentler $X^2(42) = 199.71$; CFI = 0.912; RMSEA = 0.074). The composite reliability coefficients ranged from 0.73 (Competence) to 0.80 (Relatedness), and Cronbach alpha coefficients also ranged from 0.72 (Competence) to 0.81 (Relatedness) (Vlachopoulos et al., 2013). The alpha coefficients for the present sample range 0.79 (Autonomy) to 0.83 (Competence).

Data Collection

Before the data collection process, participants were informed verbally and within the information sheet that involvement in the study was voluntary and results would be strictly confidential. The participants who signed written consent forms participated in the study. The BPNES, demographic information form, and informed consent form were administered to the participants. Self-report questionnaire responses were anonymous and took 10 to 15 minutes

to complete. The research met ethical requirements for research with human participants in Türkiye and was conducted in accordance with the Principles of the Declaration of Helsinki.

Data Analysis

The participants were classified according to the variables of age group, the type of exercise they participated in, and the period of participation in exercise programs. The classifications made are given in Table 1, and these classifications were used in statistical analysis. The normality of the data was assessed using the Kolmogorov-Smirnov test, and it was determined that the data did not follow a normal distribution ($p < 0.01$). Non-parametric tests were conducted to examine BPNES score differences because of non-normally distributed data. The Mann-Whitney U test was performed to examine differences in BPNES scores in gender (female/male) and age groups (18-29/30-45 years). In addition, Kruskal Wallis analysis of variance was conducted to determine group differences (groups of types of exercise and exercise participation period) in BPNES scores.

RESULTS

The descriptive statistics of basic psychological needs in exercise for all participants are presented in Table 2.

Table 2

Descriptive Statistics of Basic Psychological Needs in Exercise for All Participants (N = 234)

Subscales	Scale range	M	SD	Cronbach Alpha (α)
Autonomy	1-5	4.05	0.74	0.79
Competence	1-5	3.03	0.61	0.83
Relatedness	1-5	3.91	0.77	0.80

It was observed that the subscale with the highest mean value in meeting the basic psychological needs of the participants was autonomy, followed by relatedness and competence, in this order. Table 3 indicates the results of the Mann-Whitney U test and descriptive statistics by gender.

Table 3

Mann-Whitney U Test Results of Basic Psychological Needs in Exercise by Gender

Subscales	Gender				Z	p	r^*
	Female (n = 111)		Male (n = 123)				
	M	SD	M	SD			
Autonomy	4.11	0.63	3.99	0.82	-.441	.659	-
Competence	3.09	0.54	2.98	0.66	-.886	.376	-
Relatedness	4.08	0.66	3.76	0.83	-2.785	.005	0.18

* r : Effect size (Field, 2009)

As seen in Table 3, the only significant difference was found between female and male exercisers in the relatedness subscale of the basic psychological needs in exercise ($p < 0.01$, $r = .18$). An inspection of the means showed that female exercisers had a significantly higher score in the relatedness subscale than male exercisers. Regarding age group differences, we found significant differences only in the relatedness subscale ($p < 0.05$, $r = .16$). The participants in the 30-45 years age group had significantly higher scores in the relatedness subscale than those of the 18-29 age group (Table 4).

Table 4
Mann-Whitney U Test Results of Basic Psychological Needs in Exercise by Age Groups

Subscales	Age Groups				Z	p	r
	18-29 years (n = 157)		30-45 years (n = 43)				
	M	SD	M	SD			
Autonomy	4.03	0.72	4.15	0.69	-1.025	.305	-
Competence	3.02	0.59	3.13	0.56	-1.272	.203	-
Relatedness	3.86	0.76	4.14	0.72	-2.289	.022	0.16

The results of The Kruskal Wallis analysis of variance indicated that significant differences were found in all subscales by type of exercise groups ($p < 0.01$, $.23 < r < .33$). PostHoc comparisons using the Mann-Whitney U test revealed that the mean scores in all three subscales of the exercisers participating in both group and individual exercise programs (group + individual) were significantly higher than the scores of those participating in individual exercises (Table 5).

Table 5
BPNES Scores Regarding Exercise Type and Results of Kruskal Wallis Analysis of Variance

Subscales	Exercise Type						X ²	p	r
	Group (n = 51)		Individual (n = 142)		Group+Individual (n = 41)				
	M	SD	M	SD	M	SD			
Autonomy	4.15	0.53	3.93	0.81	4.33	0.61	10.108	.006	0.23
Competence	3.10	0.48	2.92	0.66	3.34	0.39	16.764	.001	0.31
Relatedness	4.13	0.61	3.73	0.82	4.28	0.55	21.076	.001	0.33

The results of Kruskal Wallis analysis of variance showed that statistically significant participation period group differences were found regarding all BPNES scores ($p < 0.01$, Table 6). Post hoc comparisons using the Mann-Whitney U test revealed that the difference was because the individuals who performed exercise for six months to less than one year had lower scores than those who exercised longer ($p < 0.01$).

Table 6

BPNES Scores in Terms of Participation Period and Results of Kruskal Wallis Analysis of Variance

Subscales	Participation Period						X ²	p	r
	6 mth-1 yr. (n = 91)		1-3 yr. (n = 58)		>3 yr. (n = 85)				
	M	SD	M	SD	M	SD			
Autonomy	3.76	0.78	4.27	0.65	4.21	0.66	24.286	.001	0.31
Competence	2.81	0.67	3.18	0.49	3.17	0.52	19.508	.001	0.30
Relatedness	3.72	0.81	4.05	0.78	4.02	0.69	11.578	.003	0.22

DISCUSSION

This study investigated the basic psychological needs in exercise of regular exercisers regarding gender, age, exercise type, and period of exercise participation. According to the research findings, a statistically significant difference was found in the relatedness subscale of the basic psychological needs in exercise concerning gender. Female exercisers had higher scores in the subscale of relatedness than male exercisers indicates that females are more committed to their relationships in exercise environments than males (Vlachopoulos & Michailidou, 2006). In this respect, it is possible to say that females have a higher sense of belonging to the exercise environments they interact with and are therefore more satisfied. The low scores of the male exercisers in the relatedness subscale can be explained by the fact that they feel the need for relationships less. This finding was in line with the findings of Kirkland et al. (2011) study with older adults, which reported that female exercisers had significantly higher scores than males in the psychological need of relatedness. Similarly, Çankaya (2009) and Goulimaris et al. (2014) stated that while there was no significant difference between genders in the subscales of autonomy and competence, females had higher scores in the subscale of relatedness. These studies noted that females' wellness increased, and their psychological well-being improved by meeting their basic psychological needs through exercise programs. In this respect, it can be said that females benefit more psychologically (reduction in anxiety, depression, stress, etc.) by participating in exercise programs than men. In the literature, it is seen that females fulfilled their relatedness needs more than males in terms of establishing bonds and making sense of relationships in daily life (Çankaya, 2009; Sari et al., 2011). When the success of women in controlling their social behaviors and emotions stemming from their gender roles (Ertürk et al., 2016) is combined with the positive feelings (wellness and psychological well-being) to be obtained by participating in exercises, it is thought that the need for bonding related to the interaction with the environment is fulfilled more. However, some studies also did not find gender differences in basic psychological needs

among regular exercisers (Öner, 2019; Standage et al., 2005; Vlachopoulos & Karavani, 2009). Both male and female individuals participating in exercise programs may need to be offered similar satisfying interactions.

The results of this study showed that younger individuals had lower scores in the relatedness subscale compared to older participants. Young adult exercisers may not care about the sense of belonging and interaction in their exercise environment compared to older exercisers. Öner (2019) conducted a study on individuals who participated in regular exercise for an average of 4.49 years and concluded that 20-29 years old individuals scored significantly lower in all subscales, including the subscale of relatedness, compared to individuals aged 30-39 years and over 40 years. Goulimaris et al. (2014) reported that, in parallel with the present results, as the age of the participants increased, they had significantly higher scores in the relatedness subscale. Kirkland et al. (2011) examined the relationship between motivation, exercise, and basic psychological needs; they concluded that autonomy, competence, and relatedness needs were positively related to the motivation to participate in exercise in adults aged 55 and older. Based on this result, it is recommended that exercise practitioners working with younger individuals create the content of the exercise program in a structure that would meet the participants' autonomy, competence, and relatedness needs. Thus, exercise programs in which this age group participates would contribute to meeting these needs.

The current study indicated that the exercisers who participated in both individual and group exercise programs had significantly higher scores in all subscales of BPNES than exercisers who participated in only individual or group activities. It can be said that exercisers participating in both programs have a higher level of freedom (autonomy). It is possible to say that individuals who choose different alternatives in exercise programs would feel both autonomous and competent for different programs. Lovell et al. (2016) reported that the competence and relatedness needs of the females who participated in group exercise programs were fulfilled more. Group exercises were more associated with relatedness due to the need for socialization. However, with the feedback of the exercise practitioners in group exercises, it was also stated that females considered themselves more competent in reaching their goals through exercise programs. The current study's finding that the autonomy, competence, and relatedness needs of exercisers participating in mixed (group+individual) exercise programs are met more supports SDT's tenets. In other words, since mixed (group+individual) exercise programs would provide more socialization, it is expected that the feeling of commitment to the exercise environment and the need to establish relationships are high (Vlachopoulos & Michailidou, 2006). The high level of interaction in group activities would enable the

participants to observe themselves more clearly and, in this way, to feel more competent in social production (Edmunds et al., 2006).

In this study, we found that exercisers who participated in an exercise program between six months and a year fulfilled their basic psychological needs less than those who exercised longer. The needs in which people's feelings of achievement, determination, and struggle emerge in daily life are motivational needs. As individuals satisfy these needs, they adjust their program preferences accordingly to increase these feelings even more (Arık, 1996). In this context, it may be possible to say that at the beginning of the exercise programs, the individual may not feel competent according to the content of the exercise and may not act autonomously in determining the content. Vlachopoulos et al. (2011) stated that participation in exercise contributes to the formation of exercise identity in the individual over time. They reported that basic psychological needs may be necessary in this process and that the period of participation in exercise programs is effective in meeting the psychological needs of individuals, such as expressing themselves and defining the outside world. They also stated that meeting the needs may be related to the participants' being novice or experienced. Öner (2019) reported that the increase in exercise participation and the weekly training amount of individuals participating in exercises increased the fulfillment of the overall basic psychological needs. The fact that the basic psychological needs of the exercisers who participated in the exercise program between six months and a year in this study were met less can be explained by the possibility that these participants did not yet feel competent in performing these exercises because they had exercised less than the others. Similarly, since they spent less time, compared to others, in the wellness and sports centers where they participated in activities, sufficient time may not have been created for interacting with individuals and meeting their commitment needs.

The research has some limitations that need to be addressed. First, the findings may be relevant only for male and female exercisers in a few recreational sports centers, limiting the the results' generalizability, having not considered exercisers participating in exercise programs in different sports centers. Future studies might examine basic psychological needs in exercise among exercisers participating in exercise programs in different sports centers. The second limitation of this study is that the participants were grouped according to the exercises offered in the sports center where the programs were organized. Therefore, outdoor exercise programs could not be included in this study. Because individuals go to recreational sports centers not only to be healthy, but also for different purposes such as socialization and gaining a place in society, in future studies, examining the basic psychological needs of the participants

from the areas where different recreational exercise programs are organized may help with the creation and design of the programs. Finally, only the exercisers aged 18-45 years participated in this study. In future studies, the participation of an extensive age range of exercisers may reveal the differences in meeting the basic psychological needs of young, adult, and elderly individuals in the exercise environment.

When basic psychological needs are satisfied, the individual will be determined to attend the exercise program (Kirkland et al., 2011). Based on this study's findings, we recommend that exercise practitioners develop exercise programs that will meet the need for the relatedness of young male participants and thus ensure their adherence to the exercise program. Group programs with enriched exercise type and content, the implementation of the "exercise buddy" practice with participants with similar goals and ability in individual programs, and the exercise leader's being empathetic in communication with the exercise participants, avoiding being judgmental or accusatory, and having an approach that respects the participant's feelings, perspective, and values are examples of practices geared towards the need for relatedness (Standage & Ryan, 2012). In addition, exercise leaders can use some techniques to address the need for competence, autonomy, and relatedness to increase beginners' persistence in the exercise program. For example, diversifying exercise programs to enable participants to decide for themselves which type of exercise (e.g., different and new skills), where (e.g., indoors or outdoors), and when (e.g., how many days a week and what time of the day) they will participate in a practice to satisfy the need for autonomy. As for the competence need, the activities and tasks should be well-defined and appropriate to the competence of the participants. The exercise leader should help the participant set realistic, challenging, but attainable goals, monitor their progress, and provide regular feedback (Standage & Ryan, 2012).

CONCLUSION

This study indicates that female exercisers fulfilled the need for relatedness and belonging more in exercise environments than male exercisers. Results indicated that younger exercisers fulfilled relatedness needs less in the exercise environment than older exercisers. Unfulfilling the need for relatedness might lead to feelings of exclusion and loneliness. For this reason, it is essential to determine the priority needs of young adults to participate in exercise environments. The participants who chose both group and individual exercise programs satisfied their basic psychological needs more, which revealed how much the

variety of recreational physical activities supported the goal of meeting the needs of the participants. Finally, exercisers participating in an exercise program for six months to less than one year satisfied their basic psychological needs less than those who exercised longer. Based on this, it can be said that regular and long-term participation may play an important role in need satisfaction.

Authors' contributions

The first author's contributions are conceptualization, methodology, investigation, data analysis, writing - original draft, writing - review & editing. The second author's contributions are conceptualization, methodology, data analysis, writing - review & editing.

Declaration of conflict interest

The author(s) declared no potential conflicts of interest.

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