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THE VALIDITY AND RELIABILITY OF THE EXERCISE BENEFITS/BARRIERS SCALE FOR TURKISH MILITARY NURSING STUDENTS

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ABSTRACT

This study aims to test the validity and reliability of the Exercise Benefits/Barriers Scale (EBBS) for female university students in Turkey. This is a validity and reliability study of the EBBS for use in a Turkish context. The study sample consisted of 409 students of a School of Nursing (97.1% of the total student body). In the study, a three-part questionnaire was used. The EBBS, developed by Sechrist (Sechrist et al., 1987), was used in the study in order to determine the participants' benefit-barrier perceptions. The EBBS validity coefficient was found to be 0.87 (re-test =0.85) for the whole scale, 0.95 (re-test=0.94) for the benefit aspect and, 0.80 (re-test=0.79) for the barrier aspect. "Physical performance" and "preventive health" were given the highest scores by the participants within the EBBS's benefit subscales. The exercise barrier subscale with the lowest score was "exercise milieu". Determining the benefits of and barriers to exercise, by using a standardized scale, plays an important role in maintaining proper levels of physical activity. The Turkish translation of the EBBS model has shown it to be an effective tool for measuring physical activity among female Turkish university students.

Key words: Adolescent health; Exercise; Health behaviours; Physical activity.

INTRODUCTION

A healthy lifestyle, being one of the 21st century's 21 health objectives, involves a simple concept, "Members of society should have adopted a healthy lifestyle by the year 2015", which emphasizes that "…healthy behaviours concerning physical activity should be considerably increased" (Aktan & Isik, 2007: 8).

Over the past 50 years, many epidemiological studies have been dedicated to improving the quality of life and public health. Physical activity has been clearly identified as a means of maintaining an individual's physical health and well-being (Morrow *et al*., 2004).

A physically active lifestyle has many measurable benefits, including the reduced risk of several severe conditions such as coronary heart disease, hypertension, stroke, noninsulin-dependent diabetes mellitus, cancer of the colon, obesity and osteoporosis. On the other side of the coin, psychological benefits include reduced levels of stress and depression, and an increased sense of well-being, heightened energy levels, improved self-confidence and

general self-satisfaction with social activities (Sechrist *et al*., 1987; Bowles *et al*., 2002; Ransdell *et al*., 2003).

The Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) recommend that every able-bodied adult should exercise every day for at least 30 minutes at a level of moderate intensity (Bowles *et al*., 2002). Research has shown that virtually all individuals can benefit from regular physical activity, whether or not they participate in moderate or vigorous health-enhancing physical activities (Ammouri *et al*., 2007). The recommendations emphasize that adults who incorporate sufficient physical activity into their daily routines experience health benefits (Morrow *et al*., 2004). In spite of the well-recognized benefits of physical activity, millions of people are physically inactive. More importantly, the prevalence of physical inactivity is on the rise (Reichert *et al*., 2007).

In the Surgeon General's "Report on Physical Activity and Health", inactivity was reported to be more common in women than in men, and more common among the elderly than in younger adults (Ammouri *et al*., 2007). Although the diseases attributed to, or associated with, physical inactivity typically do not manifest themselves before middle age, many experts recommend that efforts should be intensified in order to prevent chronic diseases on the part of at-risk children and adolescents (Pate *et al*., 2007).

One demographic that is disproportionately threatened by a statistical risk of inactivity is adolescent girls. Compared with adolescent boys, girls tend to be less active and display less interest with regard to participation in physical activities. Thus, to combat this trend, it is important to understand what makes participation in physical exercise less appealing to adolescent girls. Moreover, although the rate of exercising decreases with age, the decline in activity is sharper among females than among males (CDC, 1997; Ransdell *et al*., 2003; Dwyer *et al*., 2006).

Once girls reach adulthood, they face an even greater risk of drifting into a less active lifestyle. Adult women (aged 18 and above) tend to limit their participation in physical activity with age. A large proportion of adult women (43%) indicate that they do not engage in physical activity in their leisure time. Research indicates that only 20% of women participate in regular vigorous activity, while another 13% engage in moderate levels of physical activity on a regular basis (Ransdell *et al*., 2003; Ransdell *et al*., 2004).

RESEARCH PURPOSE AND QUESTION

This study aims to evaluate the validity and the reliability of the Turkish language version of the EBBS developed by Sechrist *et al.* (1987). The necessity of adapting the scale for the Turkish language arises from the perception of the benefits of exercise for girls and the perception of barriers that drive them to inactivity, and the need for future interventions in this area.

Under what headings can these interventions be grouped to ensure a more active life style for girls after determining the perceptions of benefits/barriers with regard to exercise?

METHODS

Design and Sample

This is a validity and reliability study of the EBBS for use in a Turkish context. The sample for the study consisted of 409 students in either their 1st, 2nd, 3rd or 4th years of study at a School of Nursing. The school is an all-female boarding school, providing nursing education at the undergraduate level. Graduates earn the title of military nurse and go on to work in the various health services in all branches of the Turkish Armed Forces (TAF).

Inclusion criteria. No differentiations were made between the students when including them in the study, because they were of a similar age and made up almost the same demographic, with similar ethnic characteristics and the same marital status. No inclusion criteria were involved since all the students attending the School of Nursing were included in the study. Out of 421 enrolled students, a total of 12 did not participate. Of these, six were unwilling to take part, four cited health problems as their reason for not participating and two were absent. Consequently, the remaining 409 students (97.1% of the total student body) were the subjects of this study.

Human subject protection and procedures. Students were informed of the study before they became involved. Participants were given an oral introduction to the purpose of the study by the primary investigator, and were given about 15 minutes to complete the questionnaire. Students could decline to participate in the study at any time. The questionnaire was completed anonymously.

MEASUREMENTS

In the study, a three-part questionnaire was used. In the first section there were five questions designed to determine the participants' demographic information (date of birth, class, height and weight, smoker or non-smoker, etc.).

The second section comprised 11 questions aimed at determining the participants' exercise habits. In this part, the participants were asked whether they were members of a sports club, had regular exercise habits and the type of exercise in which they participate (walking, running, volleyball, etc.).

For the third section of the questionnaire, in order to determine the participants' benefits-barrier perceptions, the Exercise Benefits/Barriers Scale (EBBS) was used (Sechrist *et al*.,1987). Since the EEBS has never been applied in Turkey before, a study of its reliability and validity had to be undertaken. The scale had been translated into Turkish by two linguists and retranslated from Turkish into English for an analysis of the meaning structures. Before being applied to the students, the Turkish version was analyzed and evaluated by a Turkish linguist in terms of its grammar and comprehensibility. Then the scale was pre-tested with 20 graduates of the same school, of the approximate age group as the participants, for comprehensibility and answerability. The pre-test graduates were not included in the study and were used only to assess the feasibility of the questionnaire.

The resulting questionnaire, including the scale, was given to the students in an observed classroom setting between April and May 2006. Before completing the questionnaire, the students were informed of the intention of the study and were reminded of the necessity of answering the entire form using the scale provided. The EBBS was reapplied two weeks later for the re-test. On average the participants finished the entire questionnaire in 15 minutes. Excellent internal consistency (Cronbach's $\alpha = 0.87$) was present for the EBBS, as well as excellent test-retest reliability ($r = 0.85$) across the two-week period. In the light of these findings, the adapted Turkish version of the EBBS is assumed to be valid and reliable for military nursing students and the results are based on this assumption.

Exercise Benefits/Barriers Scale (EBBS)

The perceived benefits and perceived barriers of engaging in physical activity were assessed by the Exercise Benefits/Barriers Scale (EBBS) (Sechrist *et al*., 1987). Each respondent was asked to rate the perceived benefits and perceived barriers on a 4-point Likert Scale ("Strongly Agree" to "Strongly Disagree"). The authors also wanted to examine changes in the various subscales of the EBBS. Specifically, benefits were divided into five areas: life enhancement, psychological outlook, physical performance, social interaction, and preventive health.

The life enhancement benefits subscale was obtained by calculating the mean rating of nine items related to disposition, sleep, fatigue, self-concept, mental alertness, carrying out normal activities, quality of work, overall body functioning and stamina. The physical performance benefits subscale was obtained by calculating the mean of 7 items related to muscular strength, physical fitness, muscle tone, cardiovascular functioning, flexibility, and endurance. The psychological outlook benefits subscale was obtained by calculating the mean of 6 items related to exercises enjoyment, personal accomplishment, mental health, relaxation, and well-being. The social interaction benefits subscale was obtained by calculating the mean of 4 items related to contact with friends, meeting people, entertainment, and increased acceptance by others. The prevention health benefits subscale was obtained by calculating the mean of 3 items related to prevention of heart attacks, high blood pressure, and longevity.

Barriers were divided into three areas: exercise milieu, time expenditure, and physical exertion. The exercise milieu barriers subscale was obtained by calculating the mean of 6 items from the original scale related to location, cost, prevalence of exercise facilities, and embarrassment about activity. The time expenditure barriers subscale was obtained by calculating the mean of 2 questions related to taking time away from family or work responsibilities (or school responsibilities in the case of the daughters). The physical exertion barriers subscale was obtained by calculating the mean of 3 items from exercise difficulty.

The possible scores on the benefits scale ranged from 29 to 116 points, with higher scores indicating greater benefits. The possible range of scores on the barriers scale was 14 to 54 points, with a higher score indicating fewer perceived barriers. A single EBBS score was calculated by the addition of benefits and barriers scores. The total benefits plus barriers score ranged from 43 to 170 points. The higher the score, the more positively physical activity benefits were perceived in relation to physical activity barriers.

In the study conducted by Sechrist *et al*. (1987) the standardized Cronbach's α reliability coefficients were found to be 0.95 for the total scale, 0.95 for the benefits scale and 0.89 for the barriers scale. Two-week test-retest reliability correlation coefficients were 0.89 for the entire scale, 0.89 for the benefits scale and 0.77 for the barriers scale.

Body Mass Index (BMI) classification of the participants was done in accordance with the World Health Organization (WHO) criteria. Smokers/non-smokers were identified based on the 'yes' or 'no' answers given by the participants to the "Do you smoke?" question.

DATA ANALYSIS

For the reliability analysis, the test-retest method was used and the Cronbach's alpha coefficients were calculated. For the validity analysis, factor analysis was used. In the assignment of the average scale points to different attributes, Kruskall Wallis and Student t-tests were used. All data were analyzed using SPSS for Windows (Version 10.1).

RESULTS

Characteristics of the study sample

All of the study participants were female students, with a mean age of 20.54 ± 1.20 years, and a range of 18 to 23 years. The majority of the participants were 4^{th}-year students, with BMIs within the normal range. There were no obese students and the majority of subjects were not members of sports clubs at the school. In all 14.7% of the students reported that they were smokers and 60.6% of them stated that they exercised regularly (Table 1). Average benefits and barrier scores of the participants and Cronbach's α values are shown in Table 2.

A comparison of the average points of the benefit and barrier subgroups with different variables revealed that those who exercised regularly were members of sport clubs and/or non-smokers, had higher benefit points and lower barrier points compared with non-regular exercisers, non-members and smokers respectively ($p<0.05$) (Table 3).

While the top-ranked benefit of exercise according the participants was "Cardiovascular functioning improvement", bottom-ranked was "The body looks better". "Places to exercise are too far away" was ranked number one among barriers, while "Exercise is hard work" was placed at the bottom (Table 4).

TABLE 1. **DISTRIBUTIONS OF THE STUDENTS ACCORDING TO VARIOUS DEMOGRAPHIC DATA**

	N	%
Ages		
18-20	190	46.5
21-23	219	53.5
Grades		
Year I	75	18.3
Year II	92	22.5
Year III	112	27.4
Year IV	130	31.8
Total	409	100.0
BMI		
< 18.50	70	17.1
18.50 - 24.99	323	79.0
≥ 25.00	16	3.9
Participating in sports clubs at the school		
Yes	102	24.9
No	307	75.1
Social Clubs		
Natural Sports/Scouting	39	38.2
Folklore	18	17.6
Basketball	15	14.7
Volleyball	14	13.7
Steppe	11	10.9
Others	5	4.9
Smoking Status		
Smoking	60	14.7
Not Smoking	349	85.3
Taking Regular Exercise		
Active	248	60.6
Non-active	161	39.4
TOTAL	409	100.0

TABLE 2. **EBBS TOTAL, BENEFITS-BARRIERS MEANS AND CRONBACH'S A VALUES**

	Mean	SD	Min	Max	α	Re-test α
EBBS Benefit	90.68	12.98	29	116	0.95	0.94
EBBS Barrier	28.66	5.50	14	54	0.80	0.79
EBBS Total	119.33	12.18	43	161	0.87	0.85

TABLE 3. **COMPARISON OF THE EBBS BENEFITS-BARRIERS SCORE MEANS OF THE STUDENTS IN TERMS OF EXERCISING, SMOKING AND PARTICIPATING IN CLUB ACTIVITIES**

	BENEFITS					BARRIERS				
	N	Mean	SD	t	p	N	Mean	SD	t	p
Exercising										
Yes	248	94.77	11.21	8.590	.001	248	27.47	5.09	-5.62	.001
No	161	84.37	13.03			161	30.48	5.61		
Smoking										
Not Smoking	349	91.36	12.17	2.587	.010	349	28.37	5.33	-2.52	.012
Smoking	60	86.70	16.52			60	30.30	6.19		
Club Membership										
Yes	102	96.36	11.20	5.270	.001	102	27.51	5.95	-2.44	.015
No	307	88.79	13.00			307	29.04	5.30		

TABLE 4. **TOP EXERCISE BENEFITS/BARRIER STATEMENTS**

Benefits	**Mean**	**SD**
Improves functioning of cardiovascular system	3.420	.58
Muscle strength increased	3.418	.58
Physical fitness level higher	3.379	.67
Decreases feelings of stress and tension	3.369	.66
Improves flexibility	3.347	.63
Stamina increased	3.330	.63
Enjoy exercise	3.310	.70
Prevents heart attacks	3.262	.61
Improves the way body looks	3.257	.67
Barriers	**Mean**	**SD**
Places to exercise too far away	2.511	.86
Exercise is tiring	2.467	.74
Too few places to exercise	2.342	.80
Exercise is fatiguing	2.325	.74
Inconvenient facility schedules	2.218	.78
Exercise is hard work	2.169	.80

Note: Classification taken from EBBS (Sechrist *et al*., 1987). There is a total of 29 benefit items on the EBBS. Scoring: 4= strongly agree; 3= agree; 2= disagree; 1= strongly disagree.

Construct and discriminant validity of the EBBS

The factor analysis conducted in this study disagrees with the original test developers' factor analysis (Sechrist *et al*., 1987). The test developers identified nine factors that accounted for 65% of the variance. Factor analysis of the resulting 43-item instrument yielded a seven-factor solution, which explained a variance of 57.1%, as shown in Table 5.

When the 43 EBBS items were examined, 29 items were loaded exclusively on one each of the seven factors. The content interpretation of each factor was straightforward and proved valid (Table 6), yielding five benefit and two barrier factors. In this study, only three (factors of 3, 5 and 6) comprised items identical to factors from the original test developers. A few items are different from the original scale in the 1st, 2nd, 4th and 7th factors.

A Kruskall-Wallis analysis demonstrated that there were significant differences between the five benefit questions associated with physical activity ($p< 0.001$). Subjects indicated that the numerically highest benefit derived from physical activity was an improvement in their physical performance (3.3 ± 0.53) (Figure 1).

It was shown numerically that subjects reported that the least beneficial aspect of physical activity was the opportunity for life enhancement (3.0 ± 0.55). In this study Cronbach's α was 0.95 (n=409) for the benefit scores.

As a result of the post-hoc analysis, the interactions between factors were found to be as follows: Factor 3, which is life enhancement, affects all three factors.

Results of the Kruskall-Wallis ANOVA indicated that there were no significant differences between the two barrier questions associated with physical activity ($x^2= 1.43$, $p>0.001$). Numerically, the largest barrier to physical activity reported by subjects was the exercise milieu involved (2.3 ± 0.62). In this study, Cronbach's α was 0.80 (n=409) for the barriers to action.

TABLE 5. **EIGENVALUES, PER CENT VARIANCE EXPLAINED, AND CUMULATIVE PER CENT VARIANCE EXPLAINED BY FACTORS ON THE EBBS (N=409)**

Factor	Factor label	Eigenvalue	Factor %	Cumulative %
1	Physical performance	13.730	31.930	31.930
2	Psychological outlook	3.435	7.989	39.919
3	Life enhancement	2.321	5.397	45.315
4	Social interaction	1.567	3.645	48.961
5	Preventive health	1.320	3.070	52.031
6	Physical exertion	1.167	2.714	54.745
7	Exercise milieu	1.038	2.414	57.159

TABLE 6. **FACTOR INTERNAL CONSISTENCY AND LOADINGS IF ITEMS FROM THE EBBS* (N=409)**

Item	Alpha	Loading value
Factor 1 - Physical performance	.88	
Stamina increased		.76
Physical endurance improved		.75
Physical fitness level higher		.74
Self-concept improved		.73
Flexibility improved		.72
Muscle strength increased		.70
Factor 2 - Psychological outlook	.87	
Mental alertness increased		.76
Feelings of well-being improved		.76
Sense of personal accomplishment given		.72
Stress and tension decreased		.71
Mental health improved		.71
Enjoy exercise		.70
Makes feel relaxed		.69
Factor 3 - Life enhancement	.75	
Sleep better		.67
Body functioning improved		.66
Normal activities carried out without tiredness		.64
Disposition improved		.61
Factor 4 - Social interaction	.71	
Enjoy exercise		.70
Good entertainment		.65
Contact with friends		.60
Factor 5 -Preventive health	.69	
Prevents high blood pressure		.60
Live longer		.60
Prevents heart attacks		.47
Factor 6 - Physical exertion	.77	
Exercise is tiring		.54
Exercise is fatiguing		.54
Exercise is hard work		.52
Factor 7s- Exercise milieu	.64	
Places to exercise too far away		.60
Inconvenient facility schedules		.50
Too few places to exercise		.49

Only moderate or greater factor loadings (.47+) are included.
Overall EBBS Cronbach's $\alpha = 0.95$

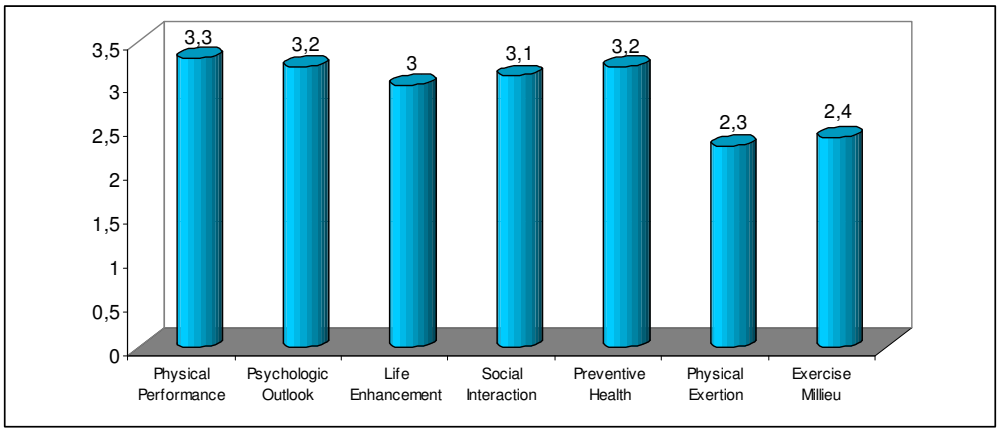

FIGURE 1. **MEAN BENEFITS/BARRIERS FACTOR SCORES (N=409). A HIGH SCORE EQUALS GREATER BENEFITS/BARRIERS PERCEPTIONS**

DISCUSSION

In this study, the exercise habits of the military nursing students were examined and the EBBS developed by Sechrist *et al*. (1987) was adapted to create a Turkish language version. Validity-reliability studies were conducted. It can be concluded that the results of this study significantly contribute to the authors' understanding of the benefit and barrier perceptions of female university students.

According to the 2003 population census, the population of Turkey is approximately 70 million. About 18.7% of the population (approximately 14 million) are between 15 and 24 years of age (Koc & Hancioglu, 2003). Cultivating patterns of healthy behaviour among such a large number of young people is a priority for the public health sector. Habits involving higher levels of physical activity are highly effective in protecting and improving the health of the younger generation.

The correlation between physical activity during adolescence (13 to 18 years) and during young adulthood (21 to 35 years) is low. It has been suggested that the highest rate of decline in physical activity occurs in late adolescence and early adulthood (those aged between 18 and 24 years) (Grubbs & Carter, 2002).

However, in Turkey there are a few studies on the frequency of physical activity and barriers to exercise on the part of the younger population, or relating to a scale for measuring the exercising conditions of the young population. Studies on the exercise habits of adolescents in Turkey offer results comparable to those in the literature. In a study of adolescents by Vaizoğlu *et al*. (2004) it was found that the energy spent in physical activities was significantly lower in girls compared to boys. In another study by Ozmen *et al*. (2007) it was found that 23.5% of females were in the habit of exercising regularly, compared to 55.0% of male students.

Another study indicated that girls were inactive, and the weekly exercise period of about three-quarters of adolescents in Turkey was inadequate (Kara *et al*., 2003).

A study performed on teachers who are expected to be role models in persuading adolescents to be more physically active, the results also did not differ much (Tokuç & Berberoğlu, 2007).

According to the results of these studies, it can be concluded that girls have a more inactive life in Turkey. It is also clear in this context that the reasons why they do not exercise and what they perceive as benefits and barriers, and the degree to which they perceive these, should be investigated. The authors of this paper are of the opinion that the results of this study may contribute to clarifying the perceived reasons for these barriers and will help to remove them.

Physical activity intervention specialists must identify age- and location-specific benefits and barriers. Health professionals need to formulate methods to increase the perceived benefits and reduce the barriers. A higher rate of success can be expected, if and when they target these specific issues (Ransdell *et al*., 2004).

It is essential that conditions for exercising, and how to determine benefit and barrier perceptions among young people in Turkey, be explored. This is why it was necessary for the EBBS scale to be translated into Turkish, and its validity and reliability studied. This Turkish adaptation could be used for different age groups by various researchers and hopefully the data extracted can be expanded.

As can be seen from Table 1, almost all of the participants were of a normal weight. In fact, weight had no discernible effect on their exercising behaviour ($p>0.05$). However, gaining weight as they become older inevitably threatens their health. This is partly due to the correlation between decreasing physical activity levels and increasing rates of obesity and overweight among young people, as well as among middle-aged adults (Page *et al*., 2003-2004). Inactivity is probably one of the most important risk factors in terms of overweight and obesity development and maintenance (Pietrobelli *et al*., 2005). The obesity prevalence value of Turkish girls (45.5%) corroborates this (Mackay *et al*., 2006a).

Responses by the participants to the EBBS were compared for their consistency on responses related to regular exercising, smoking/non-smoking and membership of sports clubs. Regular exercisers, non-smokers and club members have a higher average benefit point in the EBBS ($p<0.05$).

In similar studies, exercising participants have high average benefit points while their barrier points are low (Grubbs & Carter, 2002; Ransdell *et al*., 2004). In the study under consideration in this paper, although the rate of exercising (60.9%) seems to be high given the opportunities provided by the university in terms of current club activities and compulsory physical training course, this figure could actually be considered to be low. In Page's study, when the female students' exercise patterns of the previous week were analyzed, 45.8% were classified as "low activity" whereas only 22.8% were classified as "moderate-high activity" (Page *et al*., 2003-2004). The present study shows very similar results.

The low level of exercise benefit perception and the high level of barrier perception on the part of smokers (14.7%) show that smoking affects exercising behaviour. In Turkey, the prevalence of smoking among adolescent girls is 3.1%, while the prevalence of smoking in adult women is 17.6% (Mackay *et al*., 2006b). If exercising and quitting smoking were encouraged, it would have a direct effect on the future quality of life of those females moving from youth into adulthood.

Participation in club activities is shown to be effective in increasing exercise behaviour. Encouraging participation in such activities would increase the perception of the benefit of exercising, and could be effective in reducing the barrier perceptions (Table 3).

Consistent with expectations, the Exercise Benefits/Barriers Scale (EBBS) was generally upheld as a psychometrically sound instrument, as evidenced by good internal consistency, temporal reliability and convergent validity. The EBBS validity coefficient was found to be 0.87 (re-test =0.85) for the whole scale, 0.95 (re-test=0.94) for the EBBS benefit and 0.80 (re-test=0.79) for the EBBS barrier. This result reflected the α coefficients obtained by the original scale developers and evaluated as appropriate for use among female university students in Turkey (Table 2).

As can be seen from Table 4, students rank cardiovascular functioning improvement (3.42±0.58) and muscle strength increase (3.42±0,58) at the top in the EBBS benefit perception items in terms of point averages. In Williams' study of women (3.8) and Grubbs and Carter's study of girls and boys (3.55), "higher physical fitness level" were found to be the top-rated item (Grubbs & Carter, 2002; Williams *et al*., 2006). The younger population, instead of valuing perceptions such as "protection against chronic sicknesses", was more interested in physical performance and appearance. In the study under review, contrary to this tendency, developing cardiac health is highest placed. Although it may seem unusual for female students, their occupational tendencies as health personnel and their presence in the military may help to explain this finding. Heart disease is the leading cause of death and disability in American women (Perry & Bennett, 2006). In Turkey, on the other hand, circulatory system diseases are ranked third (16.6%) in the list of causes of death (Hacettepe University, 2006). In summary, the relative risk of coronary artery disease in sedentary individuals, in comparison with active persons, is approximately 1.9 (Blair & Conelly, 1996). Nurse practitioners (NPs) play an important role in counselling women with regard to increasing their physical activity in order to achieve the recommended levels (Perry & Bennett, 2006).

When the barrier items constituting 14 out of the total of 43 items in the EBBS are considered, the top items were found to be "places to exercise are too far away" (2.51±0.86) and "exercise is tiring" (2.47±0.74). The former barrier was addressed by moving the dormitories closer to the gym after the research had been completed. In similar studies, "exercise is tiring" was also found to be among the top barriers to exercise (Grubbs & Carter, 2002; Williams *et al*., 2006; Reichert *et al*., 2007).

In the factor analysis of EBBS, 43 items are concentrated into seven factors, explaining the scale with a 57.1% variance. As shown in Table 5, the factor analysis for the scale of this

study is different from that of Sechrist, while it is the same as that found in Brown's study (Brown, 2005). This study supports Brown's statement that the difference in his findings would be reference to other studies. As to why the physical performance factor bears the highest mean score among benefit subgroups of the EBBS, it seems to be that the physical requirements with regard to acceptance to the school, and the military nature of the institution, explain their high rates of physical activity.

Benefit Subscales of the EBBS

According to the responses of the participants, physical performance (3.3 ± 0.53) and preventive health (3.2 ± 0.53) were given the highest scores among the EBBS's benefit sub-scales. Similar results were obtained from the average points of the EBBS items. Increasing the sensitivity of the students concerning these items would constitute significant attempts to protect, sustain and improve the health, not only of themselves, but also of those with whom they deal professionally.

Although, in the interaction of the EBBS benefit subgroup factors, internal consistency and loading were in the first rank in the original study but only third in this study, life enhancement happens to be the most influential factor (Table 7). Life enhancement affects three benefit subgroups - physical performance, psychological outlook and preventive health.

TABLE 7. **THE INTERACTION OF BENEFIT FACTORS WITH EACH OTHER**

Factor	Affecting Factors	p
Physical performance (factor-1)	Life enhancement	0.0001
	Social interaction	0.003
Psychological outlook (factor 2)	Life enhancement	.001
Life enhancement (factor 3)	Physical performance	.001
	Psychological outlook	.001
	Preventive health	.001
Social interaction (factor 4)	Physical performance	.003
Preventive health (factor 5)	Life enhancement	.001

The mean difference is significant at the .05 level.

Barrier Subscales of the EBBS

The lowest exercise barrier subscale was the "exercise milieu". The problem with the remote location of the sports facilities has been solved by the school management by moving the student dormitories closer to the gym. Forming more appropriately scheduled programmes for the students with regard to exercise would also help to remove problems in terms of the "exercise milieu". Barriers relating to exercising itself (i.e. perceptions of fatigue and it being hard work) could be reduced by emphasizing the importance of exercise in other parts of the curriculum. Research has shown that those who exercise have a higher benefit perception and a lower barrier perception. Since those exercising are aware of the benefits, the hardest step would be to persuade someone to start exercising (Grubbs & Carter, 2002). Perceived barriers could slow or stop healthy behavioural changes. Physical barriers actually prevent behaviour adoption (Bowles *et al.*, 2002).

Multifaceted variables will most likely play a role in fostering increased physical activity among young people. Furthermore, the relevant composition of the variables may differ in terms of gender and across adolescence. With accumulating scientific evidence that moderate to vigorous physical activity can have positive effects on physical and mental health throughout life, the search for factors influencing the adoption of an active lifestyle must continue.

Childhood and adolescence are ideal developmental periods for fostering an active lifestyle that can be maintained throughout life (Garcia *et al*., 1998). Emphasis is currently being placed on beginning physical activity interventions early in life, preferably during the elementary school years, and continuing thorough middle and high school years.

Inactivity early in life correlates with sedentary adulthood, precursor of chronic diseases such as coronary heart disease and osteoporosis at a young age. Behaviour such as inactivity, learned early in life, persists and is difficult to extinguish. Research findings have shown that many adults who repeatedly initiate regular physical activity are unable to maintain it over time and so do not reap health benefits (Robbins *et al*., 2001).

Exercise also has some additional positive effects such as improving self-confidence and academic success, while reducing depressive symptoms related to the specific problems of the adolescent period (Kara *et al*., 2003).

LIMITATIONS

This study has several limitations. These include the fact that the study group consisted of only female students. In addition, the study group had a very narrow age range (18 to 23 years). These ages also correlate with the school year of the students. Because the school in which the study was conducted was a military school, the mandatory physical training courses may have caused the study results to show a partial deviation.

CONCLUSION

Perceived benefits and barriers continue to play an important role in physical activity. With standardized instrumentation, these variables may play a greater role in the understanding and prediction of physical activity levels.

With the translation of this scale into Turkish, it will be possible to identify the benefits-barriers perceptions of exercising in groups of Turkish males and females of many demographics.

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