

Perceived Benefits and Barriers of Nurses to Exercise

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ABSTRACT This study was performed cross-sectionally to determine nurses' exercise benefit/barrier perceptions in a military hospital to clarify the effect of their characteristic properties on exercise beliefs. Data was collected using Exercise Benefits/Barriers Scale questionnaire, and analyzed by t-test, sample mean, analysis of variance and Kruskal-Wallis analysis of variance. Nurses appreciated importance of exercise for health prevention and life enhancement. Marital status was the most discriminating criteria on health beliefs. Nurses, who were young, married, sedentary and thin, reported physical exertion as the most pronounced barrier for exercise. Exercising favors the awareness of relationship between exercise behavior and life enhancement. Exercising might become widespread physical activity among them by setting up the easily accessible sport facilities in addition to giving them enough time to spend only by exercising in all living areas.

INTRODUCTION

Exercise is necessary for healthy lifestyle. But, it is the least applied health behavior due to technological advances and lifestyle changes (Bennie et al. 2016; Despres 2016; Hallal et al. 2012; Keadle et al. 2016; Kempainen et al. 2011; Smith 2014). Exercise can provide a lot of benefits for physical and mental health. Exercise reduces incidence of coronary heart disease, hypertension, obesity, osteoporosis, etc., as well as reduced stress, anxiety and depression (Kempainen et al. 2011; Liu et al. 2014; Melton et al. 2013; Ribera et al. 2005). So, as a non-pharmacological and behavioral intervention, exercise may be said to be more cost effective and safer preventive health behavior, and to be an important key for sense of well-being and extended years of active independent living (Chen 2010; Laws et al. 2009; Ribera et al. 2005).

Although several interventions have focused on exercise to become widespread physical activity as a part of daily life culture of society, rate of exercising among individuals remains still low. Different factors related with individuals' perceptions of exercise benefits and barriers affect the exercise behavior of individuals (Cal-

fas and Hagler 2006; Melton et al. 2013). Perceived exercise benefits can encourage individuals to participate in while perceived barriers may impede their participation in exercise. Constructs of perceived benefits and barriers are common to many health behavior theories. Among these, health belief model (HBM) is the commonly used framework. As an explanatory model, HBM tends to clarify beliefs and perceptions of individuals. HBM is regarded as a useful tool. It enables nurses to help clients to assess and manage their illness preventions, or prevent health problems. The HBM's original four constructs (perceived susceptibility, perceived severity, perceived benefits, and perceived barriers) propose that the possibility of participation in preventive health behaviors depends mainly on perceived magnitude of benefits and barriers (Lovell et al. 2010; Rosenstock et al. 1988). Based on HBM, Rosenstock et al. (1988) revealed that avoidance of negative health outcome is primary motivating force for adopting healthy behaviors. Lovell et al. (2010) stated that high benefit/barrier ratio for females could be conducive to the participation in exercise.

Health care providers are in unique position to influence community members to adopt regular physical activity (Chen 2010; Lobelo and Quevedo 2016). Since, patient teaching is achieved at utmost level when they practice the health behaviors frequently and regularly. Lobelo and Quevedo (2016) proposed that physically active physicians and other health care providers were more likely to provide physical activity counsel-

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ing to their patients, and became powerful physical activity role models. Nurses constitute largest workforce in this group. Kelley and Abraham (2007) identified nurses' crucial role in delivering health promotion advice as they interacted with many people at key points in their lives, and spent most of time with patients. Esposito and Fitzpatrick (2011) stated that nurses, who believed in health promotion and applied healthy behaviors, were more likely to be positive role models and taught healthy behaviors to their patients. McDowell et al. (1997) proposed that regularly exercising nurses were more befitting role-models in application of physical activity as a treatment than "irregularly active" nurses. Similarly, Hicks et al. (2008) stated that deficiency in practicing healthy behaviors limited the nurses' influence on promoting healthy outcomes of their patients through patient teaching and role modeling of healthy behaviors.

Nursing is a stress-intensive occupation due to several situations related with job itself and environment, such as dealing with death and dying, witnessing patient suffering, emotional exhaustion, stress owing to working conditions, and shortage in adequate staffing mixes or abilities (Smith 2014). Such working environment adversely affects the relationship between health care givers, quality of care, and therefore, patient care. Exercise is also important for nurses in coping with stress in addition to role modeling. But, exercising rate among nurses was found to be low (Koc et al. 2014). So, nurses' exercise attitude related health beliefs needs detailed investigation.

Objectives

This study was performed to determine nurses' perceptions of benefits and barriers. Effect of several discriminating properties on the exercise attitude related health beliefs were discussed.

MATERIAL AND METHODS

Design and Sample

This study was conducted cross-sectionally in a military medical academy. This academy serves both as education and research center, and medical center with a significant number of nurses (620 nurses) occupied. There were sports facilities for health care providers in hospital

campus to allow them utilize leisure time: one indoor sport complex for fitness, volleyball, gymnastic, basketball, etc., in addition to outdoor sport facilities like hiking trails, tennis courts, and football field. Population of study was planned to cover all nurses occupied in the hospital. But, some of them (178 nurses) were not willing to collaborate. Data was collected face to face by the participation of 71 percent (volunteer 442 nurses) of whole population.

Ethical Considerations

The permission of ethics committee and director of academy were taken to conduct study. Nurses were introduced the aim and benefits of study in detail. Prior to completing the study instruments, they verbally consented to participate in.

Measures

A questionnaire, prepared by authors, was used to determine demographic characteristics of participants. Heights and weights of participants were measured to calculate body mass index (BMI) during the implementation of questionnaire. Some of the characteristic properties of nurses were summarized in Table 1. Nurses' exercise beliefs were assessed by Exercise Benefits/Barriers Scale (EBBS) questionnaire (Sechrist et al. 1987). Ortabag et al. (2010) made reliability and validity of EBBS. They determined Cronbach alpha value, a measure of internal consistency, as 0.95, 0.80 and 0.87 for EBBS-benefits scale, EBBS-barrier scale and the whole EBBS scale, respectively. This value was found as 0.93, 0.81 and 0.82 in this study. EBBS was composed in total of 43 questions. Two third (29 items) of them were benefits component with five major classifications: life enhancement, physical performance, psychological outlook, social interaction, and preventive health. Remaining 14 items belonged to barriers to exercise participation. They were classified into four groups: exercise milieu, time expenditure, physical exertion, and family discouragement.

Analytic Strategy

EBBS was used to clarify nurses' benefit/barrier perceptions to participate in exercise both

as a whole and as two independent scales (Exercise Benefits Scale and Exercise Barriers Scale). It has 4-point forced-choice Likert scale scoring system: from 4 (strongly agree) to 1 (strongly disagree). Higher scores are indicative of higher perceived exercise beliefs (benefits or barriers). Minimum point collected by this scale is 43, and maximum is 172. EBBS-benefits scale score varies between 29 and 116, while this value can be obtained in the range 14-56 for EBBS-barriers scale. High scores on EBBS-benefits scale are explained with high perceived benefits to exercise, whereas high scores on EBBS-barrier scale are assessed as strong beliefs about negative aspects of routine exercise. Data processing was carried out using SPSS software program (version 15.0), and results were evaluated by t test, mean, analysis of variance, and Kruskal-Wallis variance analysis.

RESULTS

Some descriptive characteristics of nurses were given in Table 1. All the participants were female. More than half of them were younger than 31 years, married, not overweighted, and have bachelor degree. Most of married nurses

Table 1: Some descriptive properties of participants (n=442)

<i>Descriptive property</i>	<i>Number</i>	<i>%</i>
<i>Age</i>		
22-31	251	56.8
32-41	156	35.3
≥42	35	7.9
<i>Marital Status</i>		
Married	247	55.9
Single	195	44.1
<i>Number of Children</i>		
0	233	52.71
1	104	23.53
2	81	18.33
≥3	24	5.43
<i>Body Mass Index</i>		
Thin	13	2.94
Normal	341	77.15
Overweight	88	19.91
<i>Education</i>		
Health high school diploma	21	4.7
Associate degree	148	33.5
Bachelor degree	239	54.1
Graduate degree	34	7.7
<i># of Exercising Per Week</i>		
0	308	69.7
1-2	83	18.8
≥3	51	11.5

had 1-2 children. Only 19.91 percent participants were overweight. One fourth (25.51%) of the overweight participants were married, and only 12.82 percent of singles were determined to be overweight. Only 30.3 percent of participants denoted that they made exercise.

Statistical data for benefit items was provided in Table 2. Total EBBS-benefit mean was calculated to be 91.20±12.95. Exercise perception score reached peak value (3.32) in physical performance subscale, in which subscale multiple health aspects like muscle strength, fitness, flexibility and stamina were encompassed. Remain-

Table 2: Mean and standard deviation of each questionnaire item of EBBS-benefit

<i>Sub scales and items (Average score)</i>	<i>Mean</i>
<i>Physical Performance Sub-scale (AS^t = 3.32)</i>	
Exercise increases my muscle strength	3.44
Exercise increases my stamina	3.43
Exercise improves my flexibility	3.39
Exercising improves functioning of my cardiovascular system	3.35
Exercising increases my level of physical fitness	3.30
My muscle tone is improved with exercise	3.26
Exercise is the way of improving my body shape	3.24
My physical endurance is improved by exercising	3.13
<i>Psychological Outlook Sub-scale (AS = 3.23)</i>	
I enjoy exercise	3.38
I have improved feelings of well-being from exercise	3.29
Exercise decreases feelings of stress and tension for me	3.28
Exercise improves my mental health	3.16
Exercising makes me feel relaxed	3.15
Exercise gives me a sense of personal accomplishment	3.12
<i>Preventive Health Sub-scale (AS = 3.08)</i>	
I will prevent heart attacks by exercising	3.15
I will live longer if I exercise	3.09
Exercising will keep me from having high blood pressure	3.00
<i>Life Enhancement Sub-scale (AS = 3.06)</i>	
Exercising increases my mental alertness	3.23
Exercising helps me sleep better at night	3.17
Exercise improves overall body functioning for me	3.16
Exercise improves the quality of my work	3.09
Exercise allows me to carry out normal activities without becoming tired	3.06
Exercising improves my self-concept	3.02
Exercise helps me decrease fatigue	2.88
My disposition is improved by exercise	2.86
<i>Social Interaction Sub-scale (AS = 2.89)</i>	
Exercise is good entertainment for me	3.10
Exercising lets me have contact with friends and persons I enjoy	3.08
Exercising is a good way for me to meet new people	2.88
Exercising increases my acceptance by others	2.51

ing benefit-sub-scales, except social interaction, demonstrated standardized mean greater than 3 indicating true agreement that items were viewed as benefits. Psychological outlook was second highly rated perceived-benefit. Participants agreed strongly that they enjoyed exercise, and appreciated importance of exercise for health prevention and life enhancement. Least score was 2.89 for social interaction subscale. Nurses agreed most with the items “exercise increases my muscle strength” and “exercise increases my stamina”, and agreed least with “my disposition is improved by exercise” and “exercising increases my acceptance by others”.

Total EBBS-barrier mean was found as 29.66±6.60 (Table 3). Nurses perceived the physical exertion as more pronounced barrier, and time expenditure the least. Averages of barrier subscales were 2.24, 2.12, 2.09, and 2.05 for physical exertion, discouragement, exercise milieu and time expenditure, respectively. Nurses’ responses to barrier items accumulated on “disagree” choice. Participants stated that some statements did not represent barriers to regular exercising. Compared with the rest of barrier items, nurses reasonably agreed especially with the items “places for me to exercise are too far away” and “there are too few places for me to exercise”, which were major barriers for exercising. Conversely, they disagreed most with barrier items

Table 3: Mean and standard deviation of each questionnaire item of EBBS-barrier

<i>Sub scales and items (Average score)</i>	<i>Mean</i>
<i>Physical Exertion Sub-scale (AS^t = 2.24)</i>	
I am fatigued by exercise	2.31
Exercise tires me	2.29
Exercise is hard work for me	2.11
<i>Family Discouragement Sub-scale (AS = 2.12)</i>	
My spouse (or significant other) does not encourage exercising	2.12
My family members do not encourage me to exercise	2.12
<i>Exercise Milieu Sub-scale (AS = 2.09)</i>	
There are too few places for me to exercise	2.36
Places for me to exercise are too far away	2.35
Exercise facilities do not have convenient schedules for me	2.27
It costs too much money to exercise	1.92
I am too embarrassed to exercise	1.85
I think people in exercise clothes look funny	1.81
<i>Time Expenditure Sub-scale (AS = 2.05)</i>	
Exercising takes too much of my time	2.21
Exercise takes too much time from my family responsibilities	2.01
Exercise takes too much time from family relationships	1.93

“I am too embarrassed to exercise” and “I think people in exercise clothes look funny”.

Effects of various characteristics of participants on exercise beliefs were tested (Tables 4 and 5). Any statistically significant relationship

Table 4: Effects of various characteristics of participants on benefit/barrier means, and their statistical results

<i>Characteristics of participants</i>	<i>Benefit</i>		<i>Barrier</i>	
	<i>Mean</i>	<i>Statistical tests</i>	<i>Mean</i>	<i>Statistical tests</i>
<i>Age Interval</i>				
22-31	3.11	F=0.04	2.11	F=0.49
32-41	3.12	p=0.96	2.16	p=0.62
≥42	3.12		2.14	
<i>Marital Status</i>				
Single	3.16	t=1.83	2.06	t=2.41
Married	3.08	p=0.06	2.18	p=0.02
<i>Number of Children</i>				
0	3.13	KW=0.78	2.11	KW=2.24
1	3.13	p=0.68	2.10	p=0.33
2	3.07		2.19	
≥3	3.12		2.25	
<i># of Exercising Per Week</i>				
0	3.08	F=4.03	2.15	F=2.58
1-2	3.17	p=0.02	2.04	p=0.08
≥3	3.24		2.12	
<i>Body Mass Index</i>				
Thin	2.89	KW=2.11	2.30	KW=2.49
Normal	3.12	p=0.35	2.11	p=0.29
Overweight	3.13		2.17	

Table 5: Effects of various characteristics of participants on the mean of each subscale of the exercise benefits/barriers scale

Mean score	Benefits					Barriers			
	Physical performance	Psychological outlook	Preventive health	Life enhancement	Social interaction	Physical exertion	Family discouragement	Exercise milieu	Time expenditure
<i>Age</i>									
22-31	3.30	3.25	3.07	3.06	2.86	2.27	2.03	2.06	2.06
32-41	3.32	3.20	3.11	3.06	2.93	2.22	2.27	2.14	2.00
≥42	3.37	3.23	3.00	3.04	2.99	2.11	2.16	2.13	2.16
<i>Marital Status</i>									
Single	3.35	3.29	3.16	3.11	2.89	2.13	2.04	2.04	2.03
Married	3.29	3.18	3.01	3.02	2.89	2.32	2.20	2.13	2.06
<i>Number of Children</i>									
0	3.31	2.26	3.10	3.07	2.89	2.24	2.06	2.08	2.04
1	3.33	3.27	3.05	3.07	2.93	2.22	2.10	2.04	2.05
2	3.30	3.13	3.06	2.98	2.87	2.31	2.23	2.13	2.07
≥3	3.40	3.15	3.09	3.08	2.86	2.08	2.56	2.33	2.04
<i>Exercise Frequency</i>									
0	3.28	3.18	3.07	3.01	2.87	2.29	2.11	2.14	2.06
1-2	3.36	3.32	3.07	3.19	2.89	2.14	2.11	1.94	1.98
≥3	3.44	3.37	3.19	3.16	3.05	2.10	2.24	2.06	2.09
<i>Body Mass Index</i>									
Thin	3.11	2.94	2.80	2.83	2.79	2.87	2.00	2.26	2.05
Normal	3.32	3.24	3.08	3.07	2.89	2.19	2.13	2.07	2.05
Overweight	3.35	3.21	3.13	3.06	2.9	2.34	2.13	2.16	2.04

could not be observed between age and beliefs of participants. Only slight decrease in the mean of physical exertion barrier subscale was seen in addition to negligible increase in benefit means of physical performance and social interaction subscales (Table 5). Marital status was the most discriminating criteria on health beliefs (Table 5): for all sub-scales, benefit means decreased by marriage ($p=0.06$; $p>0.05$) while barrier means increased significantly ($p=0.02$; $p<0.05$). Effect of number of children on nurses' exercise perception could not be observed except reasonable increases in family discouragement and exercise milieu barrier means (Table 5). EBBS-benefit scores displayed an increasing trend with increase in exercise frequency (Table 5). EBBS scores showed statistically significant difference on benefit responses of participants between non-exercising and exercising 3 days or more in a week ($p=0.02$; $p<0.05$). Participants' perceptions of exercise benefits were in increasing order with increasing rate of BMI (Table 5), but statistical analysis revealed that this increase was not statistically significant ($p=0.35$; $p>0.05$). On the other hand, such a relationship were not observed

between barrier subscales and perceptions of participant ($p=0.29$; $p>0.05$). Nurses, who were young, married, sedentary and thin, reported the physical exertion as the most pronounced barrier.

DISCUSSION

Exercise behavior of individual is a consequential subject concerning the public health. Exercise is a necessary physical activity for preventive health, healthier population and improved quality of life (Chen et al. 2010; Liu et al. 2014; Lovell et al. 2010). Yet, it is not accepted as routine physical activity, and sedentary lifestyle has become dominant in society especially due to technological advancements (Hallal et al. 2012; Lee et al. 2012; Smith 2014). Hallal et al. (2012) affirmed that percentage of physically inactive adults was 31.1 over the world. In addition to positive impact of exercising for nurses on coping with stress, nurses' perceptions of exercise are of great importance considering public health due to "patient teaching" and "role modeling" (Esposito and Fitzpatrick 2011).

Analysis of applied questionnaires exhibited significantly high total benefit score with a mean of 3.15 in spite of reasonable EBBS-barrier mean (2.12). Certain demographic properties of participants might cause such scores: all participants were female and members of the largest group of health care providers. Most of them were young enough, and had bachelor degree or higher. They can be classified as trained individuals with advanced intellectual ability. Physical attractiveness and presentable appearance is important for such group (Choe and Im 2007; Ransdell et al. 2004). A variety of communication tools (especially TV) continuously highlight the importance of these aspects for females, which might cause significantly high physical performance score.

Working environment was also a discriminating variable for EBBS results. Setting was a metropolitan military hospital, and located in military campus where physical activity was an indispensable part of daily life (Tharion et al. 2005; Ozdemir et al. 2010). This hospital served both military and civilian patients. The hospital was not a concrete part of military campus. Certain effects of the culture of the institute (routines of military environment) on nurses' perceptions were thought to be effective on exercise habit (Ko and Chen 2010; Rosenstock et al. 1988). Actually, nurses strongly agreed that exercise was important especially for increased muscle strength, flexibility and stamina. On the other hand, working environment would be described as tiring and exhausting due to certain properties of the hospital like having capacity greater than 1000 beds, and serving patients both from civilian and military origin coming from different regions of country and from other countries. Nurses working in such a condition perceived time expenditure as barrier to exercise with lower EBBS scores.

Participants agreed almost strongly that they enjoyed exercise, and appreciated the essence of exercise for health prevention and life enhancement. Exercise was interpreted as satisfying-time to spend with friends although it was not considered as a way to meet new people and to increase acceptance by others. Nurses might content themselves with existing friends and relatives. Hard working conditions, long working times and responsibilities to family and friends might cause such barriers (Lovell et al.

2010; McDowell et al. 1997). Strict military rules would also shape the way of life.

There are some more barriers to exercise, such as lack of motivation and time, displeasure with physical activity, inadequate support of family and friends, and the environment (Calfas and Hagler 2006; Lee et al. 2015; Ribera et al. 2005). It was interesting that number and locations of sport facilities were the major declared barriers to exercise in addition to troubles related with tiring and fatigue. Participants were full-time staff of the hospital in a military campus, where enough sport facilities were in use. But, nurses reported that sport facilities were inadequate, and far away from job and/or accommodation. Guedes et al. (2010) articulated that regularly inactive individuals might evaluate the present situation more negatively than regularly active ones. Actually nurses were aware of relationship between exercise behavior and life enhancement (Choe and Im 2007; Hicks et al. 2008). In accordance with HBM, nurses, whose perceived benefits were greater than perceived barriers, made more exercise (Gorin 2006).

Given some descriptive properties like age, marital status and BMI, population displayed heterogeneous character even though EBBS means of sub-groups did almost display similar trend as compared with the response of whole population. Nurses' benefit perception for exercise was positively affected by increasing the age. Associated with increasing age, having more knowledge and experience in the field of health care, increased awareness on health prevention and life enhancement, and taking more care of their health would result in higher physical performance scores (Ansari and Lovell 2009; Melton et al. 2013). Moreover, similar variation on social interaction was observed, which might especially be attributed to fear of being alone. Survey of physical exertion barrier subscale exhibited supporting data to this idea: the mean of subscale decreased by increasing the age interval although it was actually expected to increase at older ages due to several reasons like increased health problems with age, responsibilities related with working environment and family, and reluctance (Ransdell et al. 2004).

Marital status had negative impact on exercise perceptions. More leisure time, fewer responsibilities, paying greater attention to survive physical attractiveness and presentable appearance, and more time spent with friends

and relatives as social activity distinguish exercise perceptions and behaviors of single nurses (Choe and Im 2007; Lovell et al. 2010). Married ones are primarily responsible for issues related to family health and child care in most countries over the world (Kempainen et al. 2011). Therefore, number of children affects females' exercise behavior and perceptions. Nurses, who have higher number of children, spent less time for exercise and for social interaction with friends and relatives (Ansari and Lovell 2009). Adverse approach of families had negative impact on exercise behavior. Family became major determinant in the degree of mother's freedom in the use of leisure time. Discouragement increased almost exponentially with the number of children. Participants, who had crowded family, claimed facility related reasons as barriers for exercise. EBBS-analysis displayed interesting scores for physical performance and physical exertion subscales in case of three or more children although family discouragement and exercise milieu issues had rather unfavorable scores. Such findings likely resulted from the struggle to maintain quality of life in spite of responsibilities for family and child care. However, high frequency of exercise might cause conflict for family integrity, which was thought to be reflected as a problem in exercise milieu and time expenditure (Table 5).

Nurses declared increasing benefit perceptions with BMI, which would be appreciated as positive outcome for normal and overweight nurses to encourage themselves to participate in exercise (Al-Kandari et al. 2008). Responses of thin participants exhibited the lowest benefit scores, and the highest physical exertion barrier mean from statistical evaluation. Thin participants considered exercise as a tool to survive physical attractiveness and presentable appearance instead of healthy life and role modeling to health care receivers. So, they might appreciate exercise as an unnecessary physical activity for themselves, and might be reluctant to make regular exercise. EBBS benefit and barrier means of overweight participants did not differentiate from those of normal ones. They were in peace of mind with their overweight. Concerning the exercise as an essential behavior for healthy life and role modeling to health care receivers, overweight's benefit/barrier perceptions did not differ from those of normal ones.

CONCLUSION

Analysis of EBBS questionnaire conducted in a military hospital revealed that nurses paid significant attention on physical attractiveness and presentable appearance, which were important for physical fitness. Exercising was found to have positive impact on the awareness of relationship between exercise behavior and life enhancement together with health prevention. Marital status and increase in the number of children had negative impact on exercise perceptions. Despite child care and family responsibilities, nurses endeavored to maintain quality of life and physical fitness when they had 3 or more children.

RECOMMENDATIONS

Exercising might become more widespread physical activity among nurses setting up the easily accessible sport facilities in addition to giving them enough time to spend only by exercising in all living areas. Similar survey is needed to be applied in different type and size of hospitals for a generalized determination of nurses' exercise beliefs.

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