

The Comparison of the Impact of Physical Activity on Cardiovascular Health-Related Behaviors in Male and Female High School Students, Based on the Perceived Benefits and Barriers

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Received: November 14, 2014; Accepted: February 10, 2015

Background: In designing appropriate programs to prevent risky behavioral models in order to prevent cardiovascular diseases, it is highly significant to accurately identify the predictors of cardiovascular health-related behaviors, especially in the teenagers and adults of different genders, a measure enhancing the efficiency of cardiovascular health promotion programs in different societies.

Objectives: This study was conducted to compare the impact of physical activity on cardiovascular health-related behaviors, based on the perceived benefits and barriers in male and female high school students in Kermanshah.

Materials and Methods: This descriptive cross-sectional study was carried out to analyze the predictors of cardiovascular health-related behaviors based on the perceived benefits and barriers. A total number of 500 male and female high school students in Kermanshah recruited in the academic year 2013-2014 through multi-stage random sampling technique. The instrument for data collection was a questionnaire including 34 questions classified into 3 sections: demographic information, physical activity model, perceived benefit and barrier, and physical activity. The obtained data were analyzed by SPSS-18 software using descriptive and inferential statistics.

Results: Results showed, there was a statistically significant difference between perceived benefits and barriers of physical activity in both genders ($P < 0.05$). The students' viewpoints towards perceived barriers to physical activity were different in terms of three different levels of family income with 1% error. Moreover, the findings of the test of homogeneity showed that males had a higher tendency to perform physical activities than females.

Conclusions: The findings of the study highlighted the role of predictors of perceived benefits and barriers in development of health promotion behaviors such as physical activity. This can help health authorities to prepare a suitable ground for students to perceive the benefits and barriers of healthy behavioral models such as doing physical activity that consequently changes their behavior.

Keywords: Cardiovascular Diseases; students; Motor Activity

1. Background

Cardiovascular diseases are one of the most common causes of morbidity and mortality in different communities and identification of individuals' risk of arteriosclerosis is a major public health issue (1). Coronary heart disease continues to be a leading cause of morbidity and mortality among adults in Europe and North America (2). At the beginning of the 20th century, around a hundred years ago, only a mortality rate of 10% was due to cardiovascular diseases. With the development of human society and inability to control communicable diseases and consequently the increase of life expectancy, chronic diseases, especially cardiovascular diseases become more prevalent, so that at the end of the 20th century, the rate of mortality due to cardiovascular diseases rose to 25%, and is predicted

to reach 35-60% by 2025 (3). Cardiovascular diseases are the leading cause of 17'000'000 deaths worldwide annually. The number of deaths would increase to 25'000'000 by the year 2020 if the current trends would continue (4). One of the most effective models used for preventing diseases in health education program is Health Belief Model (HBM). This model focuses mainly on preventing diseases and the relationship between individuals' beliefs about health. The prominent element in this model is the individuals' perceived susceptibility. The second element is the individuals' perceived severity, and perceived benefits. The fourth element is perceived barriers. The individuals, after analyzing the mentioned perceptions, make decision about the performance of the behavior (cues to action) (5).

HBM, which is used in this research, is an individual model of study on health behavior which was established and applied in 1950 by Hochbavm and Rosenstock in America (6). Also physical activity has been shown to reduce depression in people with coronary heart disease, being as effective as anti-depression medication for managing mild to moderate depression (7). The research has indicated that cardiovascular diseases are the first leading cause of mortality and the fifth leading cause of disability (8). The major causes of mortality in Iran include cardiovascular diseases, accidents, cancers, respiratory diseases and diseases at birth (3). Based on the reports by World Health Organization (WHO), 41.3% of all the deaths in Iran in 2005 were due to cardiovascular diseases, and it is anticipated to reach 44.8% by 2030 (9). The predictive factors of cardiovascular diseases in most of the studies have been classified into two categories of modifiable and non-modifiable factors. The modifiable factors include those related to the lifestyle such as physical activity, diet, smoking and drinking alcohol, and physiological and biochemical factors such as increasing blood pressure, weight, blood glucose and cholesterol (8, 10). The importance and benefits of regular physical activity in different periods of life to reduce the risk of chronic diseases like cardiovascular diseases have been highlighted in various studies. The studies conducted on the children and teenagers of Nova Scotia province in Canada investigated the benefits and barriers to physical activity, high cost was reported as the main barrier. Other barriers included lack of support from others, time-consuming school assignments, lack of facilities and unfavorable weather conditions. Perceived benefits to physical activity, however, included having good feeling, being entertaining, contributing to professional sport activities, producing energy and keeping physical fitness (11). Therefore, 14.6% of adolescents in different provinces in Iran suffer from obesity and are overweight due to inactivity (12). Thus, the previous studies have indicated that helping people to keep up their physical activities is a complicated process, where various factors influence the success of making changes in the healthy lifestyle with regard to physical activity. Several studies in different countries attempted to show which factor can be related to physical activity level in adolescent. Perceived benefits and barriers, self-efficacy and motivation, lack of social support, cooperation, facilities, and sufficient time were the most important concerns associated with adolescents' physical activity (13, 14). Studies have shown the difference between males and females in terms of following the healthy behavioral patterns, so called physical activity. Time constrains, doing homework, and pleasure to engage in other activities were the most important barriers for high school students not to participate in physical activity and in girls these barriers were far more than boys (15). To this end, correct recognition of the predictors of cardiovascular health-related behaviors, especially in the youngsters and teenagers in both genders is highly significant to promote the cardiovascular health in every society.

2. Objectives

Hence, the present study was carried out to compare the physical activity in relation to cardiovascular health-related behaviors based on the perceived benefits and barriers for male and female high school students in Kermanshah city in 2013-2014.

3. Materials and Methods

This descriptive-analytical study comprised 500 (250 females and 250 males) high school students in Kermanshah. The study sample was calculated proportional to population size with 95% confidence and 5% accuracy. The samples were selected randomly through the codes of students' roll call books, chosen based on the education departments in 3 regions that included two high schools, one male and one female school from each region to control the gender variable. Then, 21 students were randomly selected from each of 4 academic levels in each school. The students' tendency to participate in the research was one of the most important inclusion criteria, where those unwilling to participate were excluded from the study. The questionnaires of the center for control and prevention of diseases in US were used as the instruments to collect the data. The items related to perceived benefits and barriers to physical activity were designed according to the previous studies carried out considering the viewpoints of the experts in the field. The validity of the questionnaire was determined by 10 faculty members of public health and nutrition majors on 10 questionnaires. The reliability of the questionnaires was assessed by a pilot study on 30 high school students and confirmed by Cronbach's alpha, with $\alpha = 0.91$ as the perceived benefits to physical activity questionnaire and $\alpha = 0.78$ as perceived barriers to physical activity questionnaire. The 34 items of the questionnaire were rated based on a 4-rank scale from 0 (completely disagree) to 3 (completely agree). The data were collected over a month in 2013. A reference letter was then obtained from the school of health at Shahid Beheshti University of Medical Sciences, and presented to the authorities of education in Kermanshah for making the necessary arrangements, and completing the questionnaires by the study participants. The researcher visited the selected high school, introduced herself to the students and provided them with the required information about the objectives of the research. The informed consent was finally taken from the students. After collecting the data, the questionnaires were coded and the data obtained were analyzed using SPSS-18 software, descriptive statistics and the tests of homogeneity such as Friedman, t-test, U-Mann Whitney and Kruskal-Wallis, considering $P < 0.05$ as statistically significant.

4. Results

The age range of high school students under study was between 13 to 20 years with the mean age 16.15 ± 1.077 .

The age in 85.2% of the students ranged from 15 to 17 years and 5% were either 15 years- old or younger. The number of male and female participants was the same (n = 250). The monthly family income of most of the respondents was over ten million Rials. The means of the male and female students' height were 175 ± 7.51 and 165 ± 5.33 cm, respectively. The means of the male and female students' weight were 67.99 ± 15.23 and 58.11 ± 8.07 kg, respectively. The means of BMI for males were 21.97 ± 4.35 and for the females were 21.50 ± 2.77. As shown in Table 1, the comparison of means by Mann Whitney test showed a significant difference between perceived benefits to physical activity and perceived barriers to physical activity, with more disagreement over perceived ben-

efits than perceived barriers (P < 0.001). The findings of homogeneity test indicated different levels of physical activity for males and females (Table 2). The results of Pearson test showed no significant correlation between BMI and age, and structures of the model. Moreover, the results of the comparison of the students' viewpoints about the structures of the model analyzed by Kruskal Wallis test revealed a significant difference (P < 0.001) between the family income level and perceived barriers to physical activity (Tables 1 and 3). Furthermore, the results of Friedman test showed a significant difference between males and females regarding the classification of variables of perceived benefits and barriers to physical activity (P < 0.001).

Table 1. Results of Man -Whitney Test; Significant Difference Between the Variables of Perceived Benefits and Barriers to Physical Activity in Both Genders

	Intensity of Physical Activity			Total	P Value
	Inactive	Average	Hard		
Gender					< 0.001
Male	21	43	186	250	
Female	47	101	99	247	
Total	68	144	285	497	

Table 2. Homogeneity Test of Physical Activity Level in Terms of Gender

Independent Variable	Average Rating	Man-Whitney	P Value
Perceived benefits to physical activity		23470	0.000
Male, n = 250	281.62		
Female, n = 250	219.36		
Perceived barriers to physical activity		28906	0.146
Male, n = 250	259.88		
Female, n= 250	241.12		

Table 3. Results of Kruskal Wallis Test; Significant Difference Between the Family Income Level and Perceived Barriers and Barriers to Physical Activity

Independent Variable	Total	Average Rating	Chi-Square	P Value
perceived benefits to physical activity				
≤ 500000t	115	241.94	1.686	0.431
1000000 ≤ t ≤ 500000	142	263.43		
t ≥ 1000000	243	246.99		
Perceived barriers to physical activity				
≤ 500000 t	115	287.69	19.307	0.000
1000000 ≤ t ≤ 500000	142	268.87		
t ≥ 1000000	243	222.22		

5. Discussion

The present study was aimed to compare the behavioral predictors of cardiovascular health according to the perceived benefits and barriers in the male and female high school students in Kermanshah in the academic year 2013-2014. Since the physical activity in this study was qualitative and multidimensional (low, moderate and intense physical activity), correlation coefficient test was used to examine the hypothesis of the correlation between this variable and gender. The results of correlation coefficient test showed different levels of physical activity between males and females, so that more male students ($n = 186$) had intense physical activity compared to the moderate physical activity of the female counterparts ($n = 101$). The number of female students with inactive physical lifestyle was higher than the male students, indicating higher tendencies of males to do physical activity than females. The researches carried out among different populations have indicated low level of physical activity and tendency towards inactive lifestyle, especially in females (16). A significant main effect for gender indicated that boys accumulated more Recess Step Counts (RSC) and out-of-school step counts than girls and more recess activity time and out-of-school activity time than girls. Boys spent 78% and girls spent 63% of their recess time engaged in physical activity. Outside of school, girls spent 20% and boys spent 25% of their time engaged in physical activity (17). In a review study done by Park et al., and Salahshuri et al. it was concluded that males had more physical activity than females (18, 19). Also another study showed that the time of physical activities was longer in males than in females (20, 21). There was a significant difference between the variables of perceived benefits and barriers to physical activity in both genders. In the perceived barriers, the variable "the schedule of the sports facility is not compatible with my schedule" was ranked first in both males and females, and the variable "the others make fun of me while I do exercise" was ranked last in both groups. In the case of the perceived benefits, however, the variable "exercise increases my muscular strength" was ranked first and the variable "exercise helps me reduce my fatigue" was ranked last in both male and female groups. The study by Allison et al. conducted on high school students in Canada showed that time limitation, school assignments and interest in other activities were the most important barriers to physical activity, reported more in females than in males. Moreover, other perceived barriers to physical activity included mood, family activities, lack of energy, lack of discipline, disappointment, valuing, lack of happiness, stress, self-consciousness, lack of support from family and friends, disease and injury (16). In line with this, in a study carried out by Dambros on the students of one of the southern cities of Brazil, time was reported to be the main barrier to physical activity. In this study, females reported to be more affected than males. The barriers to physical activity include long working

hours, familial commitments, unfavorable weather conditions, lack of facilities, household chores, lack of partner (family, friends, etc.), lack of encouragement from family and friends, lack of financial resources, bad mood, fear of injury, physical limitations (like muscles), mild physical pains, physical fatigue, lack of knowledge and guidance, lack of interest, allocation of time for study, and lack of encouragement from school, and teachers and trainers (22). Another study performed on the children and teenagers in Nova Scotia in Canada analyzed the perceived benefits and barriers, showed the high cost to be the major barrier to physical activity. Other barriers included lack of partnership, time-consuming school assignments, lack of facilities and unfavorable weather conditions. The reported perceived benefits to physical activity consisted of having a good feeling, being entertaining, contributing to professional sports activities, creating energy and maintaining fitness (13). Hohepa et al. performed a study in New Zealand analyzing the correlation between the perception of barriers and the level of physical activity. Their results indicated a significant relationship between these two variables. In this study, lack of social support, lack of partnership, lack of facilities and time restriction were reported as the principal perceived barriers to physical activity in teenagers. However, enjoying physical activities and sense of success were recognized as key perceived benefits (15). The findings of the present study showed that there was a difference between the opinions of the students in the studied high schools about the perceived benefits to physical activity in terms of gender. Thus, it can be argued that male students felt more positively about the variables of perceived benefits to physical activity. The results of Kruskal Wallis test indicated a significant difference between perceived barriers to physical activity and family income level. On the other hand, the students had different viewpoints towards perceived barriers to physical activity at three different levels of family income. Given the mean levels of these groups in relation to the evaluation of barriers to physical activity, the students with moderate and low family income showed more agreement about the negative effect of barriers to physical activity than those with high family income. However, no significant difference was observed between the opinions of the groups with low and moderate family income. On the other hand, these two groups of students had comparable viewpoints about barriers to physical activity. In addition, in another study performed on the children and teenagers in Nova Scotia in Canada analyzed the perceived benefits and barriers, showed the high cost to be the major barrier to physical activity (13). Whether family income affects the variables of the model is an issue that requires more investigations. Helping people to follow physical activity is a complex issue, and success in making changes towards a healthy lifestyle by doing physical activity is influenced

by various factors. The findings of the present study showed a difference between males and females in terms of following the healthy behavioral patterns (physical activity). Therefore, through careful educational planning and health promotion programs, the health care providers and authorities can prepare a ground for students to comprehend the benefits and barriers to healthy behavioral patterns with subsequent behavioral changes to prevent cardiovascular diseases. The education authorities can also help students maintain their health by providing support and presenting appropriate educational programs and patterns to increase their self-confidence so that they overcome the barriers, in addition to including materials about the benefits of healthy behaviors in the course books.

Acknowledgements

This paper was taken from an MPH thesis (Sheada Sepahi) at Shahid Beheshti University of Medical Sciences. The author would like to appreciate the head of the department of public health at Shahid Beheshti University of Medical Sciences as well as the deputy of health at Kermanshah University of Medical Sciences for their sincere support. The author would also like to thank the principals, teachers and authorities of education in Kermanshah for their honest contribution and support to fulfill this project.

Authors' Contributions

Design and idea: Sheada Sepahi, Fatemeh Rakhshane
Data collection: Vida Sepahi, Azam Gravandi. Data analysis: Sohila Khoda Karim. Manuscript drafting: Sheada Sepahi, Vida Sepahi, Arash Salahshoori.

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