Sport Sciences and Health Research

University of Tehran
Faculty of
Physical Education and Sport Science

Predicting socio-cultural and individual constraints to regular physical activity during the outbreak of covid-19

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Article Info

Original Article

Article history:
Received: 04 September 2023
Revised: 11 October 2023
Accepted: 13 October 2023
Published online: 01 January 2024

Keywords:
abstract norms,
behavioral intention,
enabling factors,
physical activity,
sports participation motivation.

Abstract

Background: The present research was conducted regarding the prediction of socio-cultural and individual restrictions on the amount of regular physical activity in female people during the outbreak of covid-19.

Aims: The present study was conducted with the aim of predicting socio-cultural and individual constraints to regular physical activity in youth during the outbreak of covid-19.

Materials and Methods: This research is descriptive correlational research. 371 females with an average age of 24.27±0.17 years, participated via a random method. Questionnaire based on Basnef model constructs and the International Physical Activity Questionnaire (IPAQ) were used to collect data. Data were analyzed using Chi-square, logistic regression, and linear regression tests.

Results: The research findings indicate that there is a significant relationship between background variables and regular physical activity. Subjective norms, behavioral intention, and enabling factors (characteristics of sports facilities and equipment) were considered important predictors of regular physical activity among female people. Also, subjective norms and attitudes (participation motivation) affect the behavioral intention of doing physical activity in young people.

Conclusion: Therefore, it is recommended that education officials in universities, anticipate the necessary infrastructure to provide sports halls, equipment, and suitable facilities in order to improve the level of physical activity in young people. Furthermore, families identify their sport activity interests and as much as possible support them financially and spiritually. Young people also should do weekly physical activities by forming friendly groups such as being members of student sports teams.

Cite this article: Pashapoor L, Rahavi Ezabadi R, Khalili Marandi P. "Predicting socio-cultural and individual constraints to regular physical activity during the outbreak of covid-19". *Sport Sciences and Health Research*. 2024; 16(1): 61-71. doi: https://doi.org/10.22059/SSHR.2024.372131.1124.

EISSN: 2717-2422 | Web site: https://sshr.ut.ac.ir/ | Email: sshr@ut.ac.ir

1. Introduction

Health education is closely related to people's well-being, which includes physical, social, emotional**,** and mental health. Also, teaching the basics of a healthy life should include instructions related to hygiene and health in all age groups from preschool to old age, in order to make people aware of the instrumental role of physical activity in improving the quality of their life while maintaining the appropriate and satisfactory level of public health and promoting it [1].

According to U.S. America Health Ranking, physical inactivity-related costs account for over 11% of total healthcare expenditures and are estimated to be $117 billion in 2021 [2]. González et al. (2017) attempt to address the emergence of a health crisis from a physical-inactivity. Indeed, that sedentary behavior involves all activities with low levels of metabolic energy expenditure and will threaten people's health [3]. On the other hand, regular physical activity is considered one of the indicators of society's health. The World Health Organization recommends that adults need to engage in moderate-intensity physical activity, at least 30 min, five days per week [4].

Research findings show that regular physical activity prevents and reduces chronic diseases, improves mental health, reduces obesity, and increases body function [5]. Also, physical activity is known as a complex and multidimensional behavior, done in different ways such as walking, cycling, active recreation, and engaging in all kinds of sports. Therefore, individual participation in adequate amounts of regular physical activity can improve health and prevent disease [6, 7].

On the other hand, Haywood and Getchell quoted from Carl Newell (1986) suggested that movements arise from the interactions of the organism, the environment in which the movement occurs, and the task to be undertaken. He believed that if any of these three factors change, the resultant movement changes. He suggested that movements arise from the interactions of the organism, the environment in which the movement occurs, and the task to be undertaken. He believed that if any of these three factors change, the resultant movement changes. In other words, Newell calls the three factors of the individual, the environment, and the task, movement constraints [8].

Constraints are characteristics of the movement. This constraint limits movement, but at the same time, it encourages other movements. Individual constraints are unique physical or mental characteristics of a person; these constraints are either structural or functional .Structural constraints are related to the physical structure of people and can limit movement. Like leg length, height, weight, and muscle mass, these limitations change slowly with increasing age and development of people. Functional constraints relate to behavioral functions; such as experiences, fear, concentration, attention, and motivation. Such constraints can change over a shorter period of time [8].

Environmental constraints exist outside the body and in the world around us. These constraints are global rather than task specific and can be sociocultural or physical. The sociocultural environment can be a powerful force in encouraging or discouraging behaviors, including motor behaviors. One example that can be cited in this context is how the sociocultural environment in western society has changed the involvement of women and girls in sports activities over the past three decades.

In the 1950s, Western society did not expect girls to participate in sports, so they were channeled away from sports.

Task constraints are also external to the body and include the goal of a movement or the task and the rules that surround the movement or activity. These differ from the individual motivation or goals in that they are specific to the task. So, changing individual, environmental, and task constraints shape the movement that arises from their interaction. In the past, some researchers and practitioners focused primarily on individual factors, but recently, they have begun focusing on all three types of constraints.

Sallis et al. (2016) showed that the environment plays an important role in physical activity and can even lead to improve physical activity. Providing the right environment to support physical activity can be defined as a public health priority, and global public health action was urgently needed [9].

Friends and family members can provide social support to people for physical activity. Those who had company of friends and family members were more likely to reach physical activity recommendations than others. The findings of studies showed that there is a positive and significant relationship between perceived environment and social support and between social support and physical activity. So, perceived environment and social support can encourage people to participate in physical activity [10, 11, 12].

On the other hand, socio-cultural forces are introduced as environmental constraints. Therefore, socio-cultural attitudes encourage or prohibit people from performing certain motor behaviors. These cases are considered environmental constraints because they represent the general attitude or beliefs of people and exist in large quantities within certain subcultures. If these attitudes become widespread enough, they can change people's behavior. These attitudes can have a powerful effect on a person's movements, although they are not obvious at all. So, society and culture can have a profound effect on people's motor behaviors, especially in the field of sports and physical activity [8, 13].

The results of Alairu Aminat (2016) showed that socio-cultural factors influenced female participation in sports in tertiary institution in Kano State [14]. Yiga et al. (2021) showed that the existing cultural beliefs promote dietary and physical activity behaviors [15]. Ramanathan and Crocker (2009) also found that cultural heritage impacts physical activity norms, attitudes, and patterns [16].

Another factor that has been influencing people's physical activity as an environmental constraint in recent years is the COVID-19 pandemic. In March 2020, the respiratory disease caused by the SARS-Cov-2 virus, COVID-19, was declared a pandemic by the World Health Organization. The COVID-19 pandemic and the subsequent lockdowns have contributed to significant changes in nearly every area of life and the economy all over the world. Although a lockdown increases the chance of effectively dealing with COVID-19, it also contributes to a decrease in people's well-being, invoking several adverse emotional reactions such as anger, fear, confusion, irritability, frustration, elevated stress, insomnia, and nervousness. Thousands of people have lost their work and the socio-economic status during the COVID-19 pandemic. Numerous studies have reported an increase in anxiety and depression among people around the world.

Research also indicated that younger adults were at higher risk of anxiety, depression, and alcohol use than adults with an average age and above [17, 18]. There is a necessity for improving the physical and mental health of the youth, improving their mood, and reducing mental and emotional stress, fatigue, anxiety, and depression through physical activity and increasing active behavior during the coronavirus pandemic.

Intending to increase awareness and acceptance of regular physical activity benefits among female students and create an active society, this study has predicted socio-cultural, individual, and environmental constraints of regular physical activity using the Basnef model. The application of this model in the country is to study behavior, identify behavior and create new behaviors and change behavior. This model refers to the combination of two models of PRECEDE[1] and behavioral intention. In developing countries, Basnef model is used to estimate health education needs. And also, it is used to determine the factors affecting people's decision to perform behavior and also to study behavior and plan to change the Basnef model; the starting point for analysis is person's individual behavior.

The current research investigates the effects of socio-cultural constraints (family, friends, and important people), internal motivation, and behavioral intention as individual constraints, and the availability and characteristics of sports facilities as environmental constraints on the amount of regular physical activity among female students of public universities of Tehran. And also examine whether subjective norms and attitudes (participation motivation) affect the behavioral intention to do physical activity in young people.

2. Materials and Methods

2.1. Participation

The statistical population of this research is female students of Tehran public universities. Due to the conditions of the coronavirus pandemic, 400 questionnaires were designed online on Google based on Morgan's table. Then the questionnaire's links were sent online through a random sampling method. Finally, 371 people completed the questionnaires and send the questionnaire on time. Mean age of statistical sample is 24.27±0.17 years.

2.2. Instrument

Using similar research, the research group designed questionnaires related to Basnef model structures for questions of attitude, behavioral intention and abstract norms, similar to Likert questionnaires, and the response scale for these questions are five points. For the enabling factors (environmental and individual possibilities), they designed a three-level response scale. Then, using the opinions of experts regarding the subject of study, the content and structure of the designed questionnaires were evaluated and their validity was confirmed. The reliability of the designed questionnaires was done as follows:

At first, a preliminary survey was conducted on 30 students. Then, using Cronbach's alpha test, the reliability of the questionnaires of abstract norms, attitude and enabling factors (individual and environmental possibilities) and behavioral intention were confirmed as follows:

1. Attitude Questionnaire (participation motivations). This questionnaire

1 . PRECEDE model is a useful theoretical framework for planning, conducting, and evaluating health promotion programs.

included eight questions (alpha coefficient 0.88); for example, "Having regular physical activity helps me to be more cheerful" which was measured by five- point scale from 1 (strongly disagree) to 5 (strongly agree). Obtaining a higher score showed that there is a stronger attitude about having physical activity.

2. Abstract Norms Questionnaire. This questionnaire included six questions (alpha coefficient 0.86); for example, "My best friends think that I should have regular physical activity" with a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Obtaining the higher score indicated abstract norms encouraging physical activity.
3. Behavioral Intention Questionnaire. This questionnaire was also measured with 2 questions (alpha coefficient 0.85); for example, "I plan to exercise regularly (at least three times a week) in the next month." which was measured with five-point scale from 1 (strongly disagree) to 5 (strongly agree). A higher score indicated a stronger intention to do physical activity.
4. Questionnaire of Enabling Factors. Environmental and personal possibilities included ten questions (alpha coefficient 0.64); for example, "The distance of the suitable gym is far from my place of residence" that was measured by three-point scales (Yes, Somewhat Agree, and No). Obtaining a higher score indicated having more enabling factors to perform physical activity.

The process of conducting the research was as follows: After designing and completing the questionnaires in the Google form, the questionnaire link was prepared and sent to the participants through the cyberspace. Then participants can complete it consciously. After each completed questionnaires, they were given to researchers to analyze their items [19].

For measuring physical activity, the IPAQ (International Physical Activity Questionnaire) standard physical activity questionnaire was used. This questionnaire consists of 15 questions, classified physical activity status into three levels: (1) High: a vigorous-intensity activity that achieves a minimum of at least 3000 MET-minute/ week; (2) Moderate: any combination of walking, moderate- or vigorous intensity activities, achieving a minimum of at least 600 MET-minutes per week; and (3) Low: not meeting any of the above mentioned criteria [19].

2.4. Statistic

In order to analyze the data, descriptive statistical methods were used to draw graphs, tables and provide central tendency indicators. Initially, the Kolmogorov-Smirnov test was used to confirm data normality. The Chi-square, logistic regression, and linear regression statistical tests were used to analyze the research findings by SPSS version 26 at a significance level of $P<0.05$.

3. Results

According to the international standard physical activity questionnaire, out of 371 female students participating in the study, 105 had weak physical activity, 202 had moderate physical activity, and 64 had vigorous physical activity. The results of the chi-square test showed that there is a weak significant relationship between the contextual variables of the study such as educational level, marital status, weight, and height with regular physical activity of young people (Table 1).

Table 1. Relationship between background changes and physical activity

		Total physical activity				*P*
		Weak	**Moderate**	**Severe**	**Total**	
Gender	Girl & Boy	105	202	64	371	X^2=6.079[a], df=2, *P*= 0.048
Field of study in biological sciences	Sports	15	66	22	103	X^2= 27.852[a], df=8, *P*= 0.001
	Science	15	36	7	58	
	Engineering	33	35	19	87	
	Science	14	24	0	38	
	Humanities	28	41	16	85	
Grade	Associate degree	0	2	0	2	X^2=18.057[a], df=6, *P*=0.006
	Degree	76	151	50	277	
	Masters	29	49	11	89	
	Doctorate	0	0	3	3	
Marital status	Single	96	187	52	335	X^2=7.327[a], df=2, *P*= 0.026
	Married	9	15	12	36	
Weight	40-65	78	172	40	290	X^2=29.998[a], df=4, *P*= 0.000
	66-85	25	20	24	69	
	86-100	2	10	0	12	
Height	150-165	77	119	40	236	X^2=11.346[a], df=4, *P*=0.023
	166-176	25	82	22	129	
	177-188	3	1	2	6	

The most important predictors of physical activity among students were determined using logistic regression analysis and Ward's method. In this method, the third model was introduced as the best model, and the structures of enabling factors (under the title of sports facilities and equipment), subjective norms ,and behavioral intention were identified as the most important predictors of regular physical activity among young people. That is, socio-cultural constraints including family, friends, important people, behavior intention, and the availability of sports facilities and equipment were identified as the most predictive factors of regular physical activity among female students of public universities in Tehran (Table 2).

Also, the correlation coefficient R (0.591[a]) showed that there is a good correlation of 59% between the independent variables of subjective norms and attitude (participation motivation) with the dependent variable of behavioral intention to do the regular physical activity of young people. Moreover, the coefficient of determination shows that 34% of the behavioral intention to do regular physical activity depends on two independent variables of subjective norms, and attitude. The value of the Durbin Watson statistics for this data shows the independence of people's scores and opinions (Table 3).

The linear regression analysis of variance results showed there is a significant relationship. Therefore, there is a significant relationship between the independent variables of subjective norms and attitude (participation motivation) and the dependent variable of behavioral intention to perform physical activity.

Table 2. Logistic regression of BASNEF model variables as predictors of behavior

	The regression coefficient	Standard error of the regression coefficient	Backward Stepwise Wald	df	The significance level/ Sign	The significance level /Sign	Ratio	95% confidence interval for proportion Possibility	
								Lower	Higher
Attitude	0.348	0.385	0.817	0.366	1	0.366	1.416	.666	3.012
Subjective norms	0.990	0.288	11.809	0.001	1	0.001	2.692	1.530	4.736
Behavioral Intention	0.579	0.272	4.531	0.033	1	0.033	1.783	1.047	3.038
Sports Facilities & Equipment Constant	1.166	0.263	19.628	0.001	1	0.001	3.209	1.916	5.375
Constant	-0.567	0.351	2.608	0.106	1	0.106	0.567		

Table 3. Correlation coefficient between the independent variables of abstract norms and attitude with the dependent variable of behavioral intention to do physical activity

Watson Durbin statistics	Estimation error	Adjusted coefficient of determination	The coefficient of determination	The correlation coefficient	Model
1.987	0.85446	0.345	0.349	0.591[a]	1

Also, the linear regression coefficients showed that the attitude variable with a coefficient of 0.922 and subjective norms with a coefficient of 0.341 affect the dependent variable of behavioral intention to perform regular physical activity. The values of Tolerance (0.882) and VIF (Variance Inflation Factor) (1.134) statistics showed there is no co-linear phenomenon in this model. The results obtained using linear regression analysis indicated that subjective norms and attitudes affect the behavioral intention of doing physical activity in young people.

4. Discussion

The present study was conducted with the aim of predicting socio-cultural and individual constraints to regular physical activity in youth during the outbreak of covid-19**.** The findings of the present study showed that there is a weak significant relationship between background variables such as the field of study, level of education, marital status, weight, and height of participants, and their amount of regular physical activity.

The results of other research that investigated the relationship between background variables and physical activity showed that each of these variables can affect physical activity. These findings indicated the importance of background variables' role in physical activity.

Moeini et al. (2011) also showed that there is no significant relationship between age and physical activity [19].

Abedini et al. (2016) showed that the difference in the amount of citizens' tendency towards public sports based on gender, age, and level of education is significant, but not based on marital status [20].

Ahmadi and Nouri (2017) showed the absence of a significant relationship between the housing variable and the presence of a significant relationship with the education status and the motivation to participate in sports activities [21].

Also, the findings showed that family, friends, and other people, behavioral intention, and the availability of sports facilities and equipment are the most important predictors of regular physical activity in young people. Indeed, the family is the first small community in which the child's personality is formed. Therefore, while providing primary conditions for their children to start and keep on with physical activity, families should identify children's sport activity interests and support them financially and spiritually. Also, young people should do weekly physical activities by forming friendly groups such as being members of student sports teams. Even the professors and university faculty can engage in physical activity with the students and support them as possible. Previous studies have shown that family, friends, and others can influence people's physical activity. Bohm et al. (2016) showed that the elderly persons who had the company of family or friends to walk had a 2.45 times higher prevalence of reaching the recommendations of physical activity in leisure than those who did not [22].

On the other hand, Tabsinejad et al. (2014) concluded that enabling factors are the strongest predictors for physical activity [23]. Khajavi and Shahbazi (2015) also found that there is a significant relationship between two sources of social support (friends and others) and physical activity [11].

Tabsinejad et al. (2014) showed that the variable of social support is able to predict physical activity [23]. Also, Mousavi et al. (2019) showed that social support has a direct and significant relationship with women's sports participation [24]. Han and Won (2022) also showed that social support has a direct and significant effect on physical activity [25].

The present study supports some of the mentioned research results, but the results of Hashemi Mutlaq et al. (2017) [12], Mousavi et al. (2019) [23], and Han and Won (2022) [25] are inconsistent. The statistical population and the sampling method are proposed for non-uniformity. Therefore, the family is considered the primary source of social constraints because when someone participate in physical activities after early childhood, he probably reflects his parent's interest and encouragement. As children become physically active, parents can encourage or discourage specific sports or physical activities. Parents' early involvement could lead to a lifetime of participation in physical and sports for a child. Also, family members and people who act as socialization agents should be considered as constraints [8]. Another research found that sports facilities provided by the universities could positively encourage students to use these facilities and participate in sports activities and the universities should provide suitable and innovative sports facilities and programs that suit students' needs [26].

Also, Sallis et al. (2016) stated that the environment plays an important role in physical activity and can even lead to improve physical activity [9].

Therefore, the findings Sayyd et al. (2020) are in line with the present study, among the possible reasons are the online research method and the young statistical population [26]. But it seems that our results are not aligned with the findings of Sallis et

al. (2016) [9], and it is likely related to the adult statistical population.

In fact, the findings indicated that behavioral intention and the availability of sports facilities and equipment could be effective in physical activity participation4

Another result of the research is that subjective norms and attitudes affect young people's intentions to participate in physical activity. The reason for the influence of these constraints can be attributed to factors such as individual motivations, dependence on family, and being single. Also, the effect of attitude on behavioral intention is completely internal and depends on the individual; for example, a person may consider the only way to get rid of stress is to exercise and have regular physical activity, or feel that by doing physical activity will have more self-confidence and better social relations. Therefore, the attitude (participation motivation) is an internal individual and cannot be generalized to all members of society. But the subjective norm variable is an effective external factor and it can be said that family, friends, and colleagues' support and encouragement or discouragement, environmental influences, and the person's society, all affect a person's decision about physical activity.

Many researchers have come to the conclusion that subjective norms and attitudes affect the intention to do physical activity in young people [20, 27], which is consistent with current research results. In the study of Alairu Aminat (2016), socio-cultural factors affect women's participation in sports in in tertiary institution in Kano State [14]. Yiga et al. (2021) stated that existing cultural beliefs promote physical activity [15]. The findings in this field also showed that the priorities of urban and rural women are similar [28]. However, the highest priority was related to economic and personal barriers and the lowest priority was related to cultural and family barriers [14, 15].

5. Conclusion

It should be said socio-cultural constraints including family, friends, important people, behavioral intention and the availability of sports facilities and equipment are the most predictors of regular physical activity among female students of public universities in Tehran. These constraints mutually influence one another. So, in order to encourage students to actively engage in physical activity, it is essential to identify other social-cultural, individual, and environmental constraints that affect physical activity**.** Considering that the age range of the current research participants was young adults between 20 to 40 years**,** it is suggested to conduct such research in different age groups of males. Therefore, it is suggested that to improve the level of physical activity of young people, university officials should anticipate the necessary infrastructure to build sports halls, and provide equipment and suitable sports facilities for young students. In this way, an important step has been taken to supply and develop the service in the field of health education**.**

Study limitations

This study was conducted during the coronavirus pandemic. In order to follow the health protocols and protect *students*' *health*, the Basnef model questionnaire, the International Physical Activity Questionnaire (IPAQ), and the personal information Questionnaire were designed online on Google then the questionnaire's links were sent online.

Strength of the study

This study was conducted with intending to increase awareness and create an active society by predicting socio-cultural, individual environmental constraints of regular physical activity in youth during the COVID-19 pandemic.

Conflict of interest

The authors declared no conflicts of interest.

Authors' contributions

All authors contributed to the original idea, study design. LP, RRE & PKHM: Proposed the research idea and wrote the paper. LP & RRE: Data collection and formal analysis. LP, RRE & PKHM: Collected the research resources and monitored the writing Process. RRE & PKHM: Revised the paper.

Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc.

Data availability

The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Acknowledgment

We would like to acknowledge all the people who contributed to this research and we would also like to thank the students who are cooperating.

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