

The Factors Determining the Physical Activity of Students: A Systematic Review

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Abstract

Background

Physical activity in students in addition to positively affecting their different health aspects is also effective in academic progress and reducing absence from school. Physical activity in students is affected by several factors. The aim of this systematic review research was to identify the factors determining physical activities in students.

Materials and Methods

The search for detecting relevant studies was performed in electronic databases within the time range of 2008-2018. The studies were searched in Google scholar, Medline, Cochran, Scopus, EMBASE, and Web of Science. Studies meeting the inclusion criteria were included in the review. Assessment of the quality of papers was performed using New Castle-Ottawa (BOS) scale. Then, the required information was extracted and the results were reported qualitatively.

Results

A total of 12 studies (including 41,407 year-old students) were enrolled in the research according to inclusion criteria. The demographic factors associated with physical activity included age, gender, academic degree of parents and economic status. On the other hand, the psychological factors were supported by parents, support of friends, and lack of time due to school homework, computer games, sense of laziness and self-efficacy, which had a relationship with physical activity of students. Further, the environmental determinants included climatic conditions, sports facilities and equipment, and lighting of passages.

Conclusion

In students' physical activity, factors such as demographic, psychological, and environmental factors are involved. Identification of these factors can be used in health promotion interventions and planning for students.

Key Words: Physical Activity, Students, Systematic Review.

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1- INTRODUCTION

Inadequate physical activity is the first cause of mortality worldwide. Around 3.2 million people annually die because of not having physical activity (1). Having regular and sufficient physical activity reduces the risk of hypertension, cardiovascular disease, stroke, as well as breast and colon cancer in adulthood. The physical activity also improves the health and function of bones and is a major determinant for energy consumption and weight control. However, unfortunately over the past two decades, physical activity has diminished across all age groups (2). Performing physical activity allows for better and more effective communication and social relations. It also provides the possibility of improving the level of health, reducing obesity, and generally ameliorating the formation of life for the young generation (3). During adolescence, teenagers develop their qualifications, whereby the responsibility of health preservation is gradually relegated from parents to teenagers (4).

Furthermore, school ages are among the important periods of life for securing health in adulthood. The reason is that doing suitable physical activity during the growth years significantly helps in stabilization of health. Therefore, there is a great potential for enhancing health in this age group (5). Undoubtedly, founding a healthy and happy society is contingent upon the psychological and physical health of its members, and can be fulfilled through the attempts of healthy, efficient, and thoughtful human resources. Doing physical activity alongside acquisition of knowledge can significantly improve their learning (6). A systematic review refers to investigating a question with a clear basis which uses systematic and specific methods for the identification, selection, and critical assessment of the relevant studies as well as data collection and analysis (7). It is considered as a kind of

secondary study which deals with combining the findings of primary studies of other researchers (8). The aim of systematic review studies is effective integration of valid information and providing a basis for logical decision-making (9). Decision-makers tend to use the latest research and information for the best implementation (10). In recent years, the abundance of studies associated with physical activity necessitates collecting and summarizing evidence-based findings. Furthermore, due to the unwillingness in students for doing physical activity, this study through a systematic review attempts to identify the determining factors of physical activity among students. In this way, healthcare decision-makers can make informed decisions in health promotion interventions and plans.

2- MATERIALS AND METHODS

2-1. The databases and search strategy

The studies in the following databases were searched: Cochran, Medline (via PubMed), Scopus, Web of Science, and EMBASE. Specifically, the electronic studies, papers, and research on the recent 10 years associated with determining the physical activity of students were searched. The search was performed using relevant keywords and via 'AND' and 'OR' operators. The search strategy in the databases was as follows: :(physical activity OR exercise OR sports OR walking) AND (determinants OR factor OR predictor) AND (students OR Children).

2-2. Inclusion and exclusion criteria

The inclusion criteria were: 1. Interventional and observational studies with the aim of determining the physical activity among students, 2. Studies with student target group, 3. English studies published in electronic journals from 2008 to 2018, 4. The papers should have full text. The exclusion criteria were: 1.

Studies performed in a group other than students, 2. Pilot studies, 3. Qualitative studies, 4. Review studies, 5. Studies whose participants had any special or chronic disease and disability preventing them from having physical activity.

2-3. Selection of the studies

After collecting the studies from the databases of interest, first, duplicate cases were removed. Then, based on the inclusion and exclusion criteria and according to the title and abstract, irrelevant papers were excluded. Then, the full text of the 51 remaining papers was investigated based on the research objective. Again, irrelevant studies were removed and eventually the papers which had full relevance with the inclusion criteria were introduced in the final review.

2-4. Quality assessment

Assessment of the quality of papers was performed by the Newcastle-Ottawa scale (NOS) (11). The Newcastle–Ottawa scale is a tool used for assessing the quality of non-randomized studies included in a systematic review and/or meta-analyses. According to this criterion, papers that earned a score of 6 or higher entered the study. The minimum score in this criterion is zero and the maximum score is 9.0. Based on this criterion, articles that score 6 or higher will be classified as good quality articles. Validity and reliability of this tool have been evaluated in various studies and have earned a relatively good score (11).

2-5. Extraction and integration of data

Data extraction was performed through collecting the results of relevant studies. After extraction of required information from the selected papers, the findings were categorized and summarized in the form of descriptive tables qualitatively.

3- RESULTS

Overall, 6076 papers were retrieved from the databases. After removal of duplications and investigation of remaining papers based on title and abstract, 6024 irrelevant papers were eliminated. Then, out of the 51 remaining papers, eventually 12 studies met the inclusion criteria based on investigating their full text. The process of selection of the studies is demonstrated in **Figure.1**. The 12 studies chosen in the review were cross-sectional. The demographics associated with physical activity in 10 studies included age (12-15), gender (13-20), academic levels of parents (12), economic status (12, 20), and exercise or sport background (12, 13).

Furthermore, the psychological characteristics in 10 studies included parental support (13-15, 19, 21, 22), friends support (13-15, 18-20, 23), enjoyment (13-15), sense of laziness (19, 20, 22), lack of time (14, 20-22), school homework (18, 21), computer games (13, 21), and household chores (20, 21). Further, in seven studies, environmental determinants were reported including climatic conditions (14, 17, 19, 21), sports equipment and facilities (12, 14-17, 20, 21), and lighting of passages (14, 17). The results of the data extracted from the studies are shown in **Table.1**.

Table-1: Characteristics of 12 studies included in our systematic review.

Study	Sample Characteristics	Setting	Study Design	Instruments	Results (associations with PA)
Martin et al. 2008, (23)	n = 348 students, aged 10–14	Arab American children from middle school	Cross-Sectional	Demographic information. questionnaires containing questions assessing the TPB, SCT and MVPA	Barrier Self-Efficacy and Parental Support
Fermino et al. 2010, (19)	n=1,518, 59.2% girl students. Age ranged: 14-18	Public school network of the city of Curitiba, Southern Brazil	Cross-Sectional	Demographic, socioeconomic, behavioral, sociocultural information & instrument perceived barriers for practice of PA	Sex, social support from family, social support from friends, environmental (climate) & preferring to do other things
Lee et al. 2011, (15)	n =1,814 students. 919 boys, mean age 14.4±1.1 years	Singaporean adolescents schools	Cross-Sectional	Demographic characteristics, Three-Day Physical Activity Recall (3DPAR)	Age, sex, self-efficacy, enjoyment of physical activity, parental support, access to facilities
Leggett et al. 2012, (18)	n= 31202 students. age= 14–17 year, 50.4% females	Canadian high schools	Cross-Sectional	Demographic characteristics, PA measures for the YHS were based on the University of Waterloo’s SHAPES PA module	Sex, self-efficacy, parental encouragement, active friends & school work
Meyer et al. 2013, (17)	n=94 children. (Girls =58.5%) mean age 8.9±1.5 years	Texas border colonias	Cross-Sectional	Demographic characteristics, health characteristics, barriers to physical activity for children	Sex, environmental structures that support physical activity like a park & bad weather
Dias et al. 2015, (20)	n= 1409 students. aged 14–19	Public schools located in the urban area of Londrina, Paraná	Cross-Sectional	Demographic characteristics, leisure-time physical activity (long version)	Sex, preferring to do other things, feel lazy, lack of motivation, lack of time, lack of friends company and parents’ education
Alsubaie and Omer 2015, (14)	n= 453 male adolescents. aged 15–18	High schools in Riyadh city	Cross-Sectional	Demographic characteristics, physical inactivity was assessed using standard 30-days recall questionnaire	Age, sex, enjoyment of physical activity, lack of friends, lack of public sport club, no spare time, environmental (climate)
Jodkowska et al. 2015, (22)	n=2300, (1259 girls), ranged 13-16 years	68 schools in Polish	Cross-Sectional	Barriers to participating in physical activity were based on 21-item questionnaire & Physical activity was measured using (MVPA)	Lack of (energy, time and support) & motivation
Gontarev and Kalac (2016). (13)	n= 847 students, age range 14-18 years. 440: female.	Macedonian adolescents school	Cross-Sectional	Demographic factors, physical activity, sedentary behavior, factors associated with physical activity & environmental factors	Age, sex, self-efficacy, perceive benefit, perceive barriers, Support-parents, Support-friends, enjoyment of physical activity, watching television & computer use
Pandolfo et al. 2016, (21)	348 students aged 14-19 years, 53.2% males	Public high school in Santa Maria	Cross-Sectional	Demographic factors, IPAQ & Barriers to participating in physical activity	Having many tasks to do, lack of time and adverse weather conditions, excessive use of electronic media at home, lack of appropriate outdoor places & Family support
Rostami-Moez et al. 2017, (12)	1164 girl students. Mean age: 13.01±1.99	Schools in Hamadan city, located in the west of Iran	Cross-Sectional	Demographic characteristics, physical activity questionnaires for adolescents or children (PAQ-A/C) were used to assess students RPA level	Age, parental education level, socioeconomic status, access to facilities or equipment to do RPA and environmental settings
Santina et al. 2017, (16)	276 fifth- and sixth-grade boy students	Schools in Lebanon	Cross-Sectional	Demographic characteristics, psychosocial questionnaire measured intention, attitude, subjective norms, PBC, attitudinal beliefs, normative beliefs, perceived barriers, facilitating factors and self-identity	Sex, perceived barriers, perceived behavioral control, access to facilities or equipment to physical activity

TPB: theory of planned behavior; MVPA: moderate-vigorous physical activity; SCT: script concordance test; PA: physical activity; YHS: Yorkshire Health Study; MVPA: moderate to vigorous physical activity; IPAQ: International Physical Activity Questionnaire; PBC: perceived behavioral control; RPA: Robotic Process Automation.

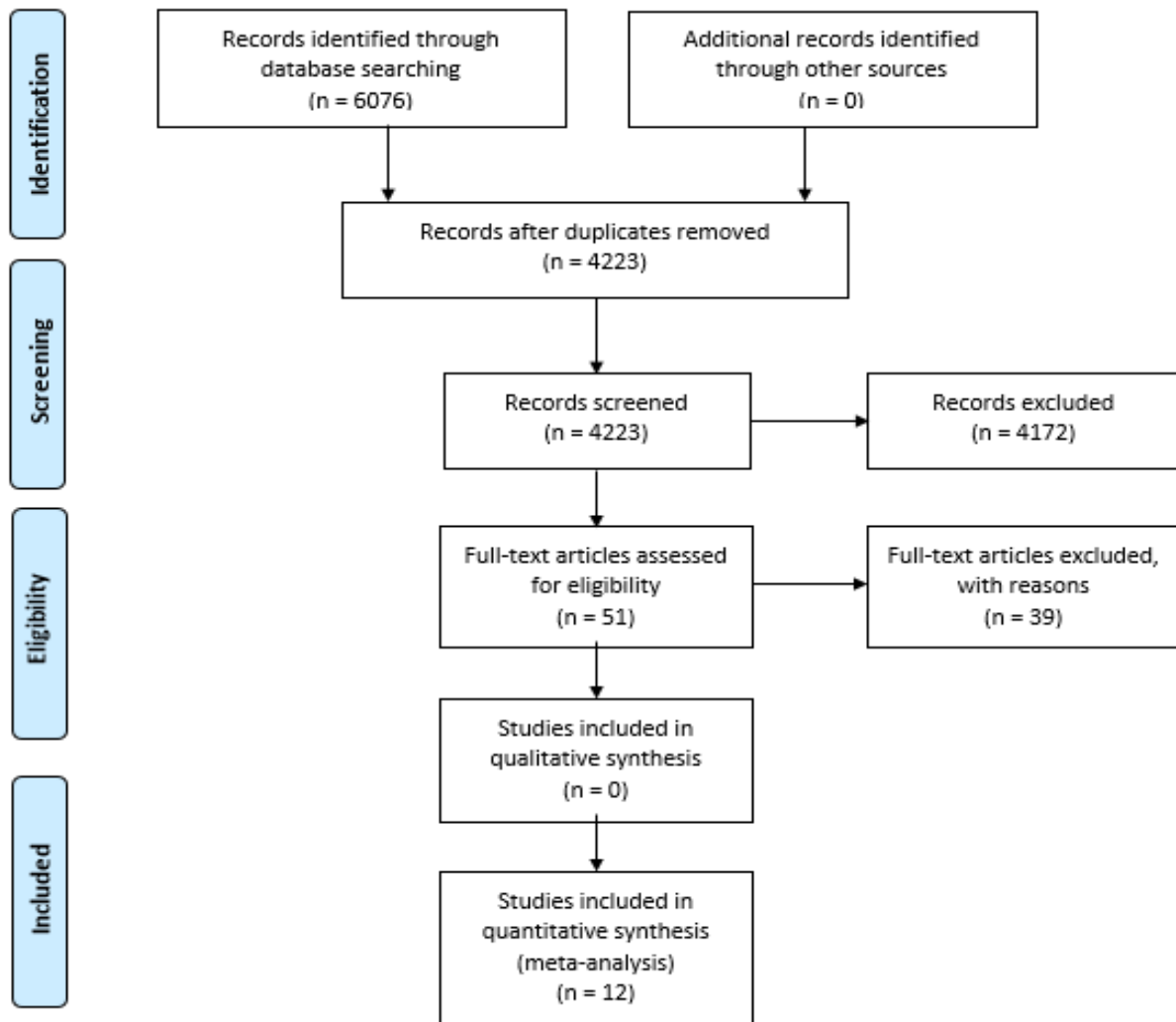


Fig.1: PRISMA flowchart.

4- DISCUSSION

The present study is a systematic review in which the studies on identifying the determining factors of physical activity among students were found and evaluated, whose results are reported further.

4-1. Demographic determinants

There was an inverse relationship between age and physical activity in four studies (12-15), which was in line with the systematic review study by Park and Kim (24). Specifically, younger students had a greater physical activity. Nevertheless, in

the study by Fermino et al. (19), there was no relationship between age and physical activity. Gender is another determining factor which had a relationship with physical activity in eight studies (13-20). Specifically, the girls do less exercise compared to boys, which was similar to the findings of the systematic review by Park and Kim (24). To resolve this problem, we should highlight the positive role of women as an incentive for doing physical activity and provide opportunities for participation of girls in physical activity. Further, in developing policies, gender equality should be considered.

Nevertheless, in the study by Martin et al. (23), no relationship existed between gender and physical activity. There was a positive relationship between the academic levels of parents and physical activity of students in the study by Rostami-Moez et al. (12), which was similar to the review study by Park and Kim's study (24). However, in the study by Dias et al. (20), there was an inverse relationship between academic education of parents and physical activity of students. Further, in two studies (14, 19), no relationship existed between parental education and physical activity. The economic status in previous studies (12, 20) had a relationship with the extent of students' physical activity, which was congruent with the results of the systematic review by Park and Kim (24). The teenagers who have a better socioeconomic status employed the facilities of the private sector when public facilities are scarce. On the other hand, for teenagers with a low socioeconomic status, it is difficult to achieve the facilities of the private sector. For this reason, provision of public facilities for physical activity to be used by students can resolve the problem. There was a positive relationship between previous sports or exercise history and physical activity of students in other studies (12, 13), which was in line with the study by Park and Kim (24).

4-2. Psychological determinants

There was a positive relationship between parental support and physical activity in six studies (13, 15, 18, 19, 21, 22), which was in line with the systematic review by Park and Kim (24). However, in the study by Martin et al. (23), no relationship existed between parental support and physical activity. By enrolling their children in different sports, paying the costs and transportation for getting to sports centers, parents can encourage physical activity in students. Further, there was a positive relationship between friends' support and physical activity in

seven studies (13-15, 18-20, 23), which was congruent with the systematic review studies of Park and Kim (24) and Somerset and Hoare (25). There was a positive relationship between enjoyment and physical activity in three studies (13-15), which was in line with the systematic review study by Ramezankhani et al. (26). Interventions should target improving physical activity enjoyment through different activities including basketball, football, swimming, jogging after school, which are of interest and needed by children. There was a relationship between sense of laziness and physical activity in three studies (19, 20, 22), which was congruent with the Park and Kim's study (24). Sense of laziness reflects low level of motivation in doing physical activity.

There was also a relationship between time shortage and physical activity in 4 studies (14, 20-22), which was in agreement with the review study by Somerset and Hoare (25). Lack of time indicates that other activities such as school homework (18, 21), computer games (13, 21), and household chores (20, 21) possess greater priority compared to doing exercise. By creating local exercise sessions and making them available to children during the school time or after school, these obstacles can be eliminated. There was a positive relationship between self-efficacy and physical activity in four studies (13, 15, 18, 23), which was in line with the review study by Park and Kim (24).

To enhance self-efficacy in teenagers, interventional programs should be regulated: 1- providing enjoyable experience of physical activity such as fast jogging, 2- development opportunities for observation of physical activity of important figures for students such as parents, teachers, and peers, 3- providing some reinforcement for participation in physical activity, and 4- reducing anxiety through participation in physical activity. Finally, there was a relationship between

perceived barriers in two studies (13, 16), perceived benefits (13), as well as perceived behavioral control (16) and physical activity, which was in line with the review study by Park and Kim (24).

4-3. Environmental determinants

There was a relationship between environmental factors and physical activity in two studies (12, 14), which was congruent with the results of Park and Kim (24) and Somerset and Hoare (25). Supportive environments cause enhanced physical activity; in this way, use of bicycles by students, and if it is a suitable place for keeping the students accessories, their physical activity also increases. There was a relationship between climatic conditions and physical activity in four studies (14, 17, 19, 21), which was in line with the systematic review by Ramezankhani et al. (26). When the weather is extremely hot or cold, the physical activity of students decreases. There was a relationship between deficient sports facilities and equipment as well as suitable space in seven studies (12, 14-17, 20, 21), plus lighting of passages (14,17), and physical activity, which was in accordance with the systematic review studies by Ramezankhani et al. (26), and Somerset and Hoare (25). To resolve environmental issues, first streets should be created that are suitable for jogging and running. Also, paved streets, use of the open space of mosques and churches as well as schools close the place of residence of children are recommended. Finally, the school ground as well as facilities and equipment were unsuitable for doing some games; by changing the structure of the school environment and modifying the rules in using the support equipment, this problem can also be resolved.

4-1. Limitations of the study

Considering the probability of publication of papers other than English in the mentioned databases, the inability of the

researcher to study these papers was the major limitation of this study. By investigating the original language of the paper found as one of the inclusion criteria, the researcher tried to minimize this limitation is much as possible. Further, in this study, due to time constraints, it was not possible to investigate the research and papers and search was performed only in electronic databases.

5- CONCLUSION

Overall, out of the 12 studied papers, different variables were found which had a significant relationship with physical activity. Unchangeable demographic variables were age, gender, and parental level of education; special attention should be paid to some programs specifically for these subgroups. Parental support had a significant effect, and as such parents should be trained about the importance of exercise during the teenage period. Policymakers and teachers should be aware that by developing more local exercise opportunities, costs would decrease. Further, local clubs and schools should cooperate with each other to promote participation of children in physical activity in order to provide less expensive local opportunities. When planning regulations, policymakers should be aware of the factors affecting the physical activity of students.

Further, in order to achieve the target of promoting physical activity in students, the Ministry of Education should cooperate with other organizations including Ministry of Health, physical education organization, and voluntary groups. The results of this research can provide valuable information for researchers and planners of health promotion programs to be used in educational interventions and prevent repeated work.

6- CONFLICT OF INTEREST: None.

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