ISSN: 2476-5279; International Journal of Musculoskeletal Pain Prevention. 2019; 4(4): 263-269.

Educational Program and Sitting Posture Improvement among Female Student

ARTICLEINFO

Article Type
Original study

Authors
Samaneh Norouzi[1], *PhD condidate*
Sedigheh Sadat Tavafian[2*], *PhD*
Sedigheh Kahrizi[3], *PhD*

How to cite this article

Norouzi S. Tavafian SS. Kahrizi S., Educational Program and Sitting Posture Improvement among Female Student. 2019; 4(4): 263-269.

[1] PhD, Health education & Health promotion Department, Medical Sciences Faculty, Tarbiat, Modares University.
[2] PhD Health Education & Health Promotion Department, Medical Sciences Faculty, Tarbiat Modares University, Tehran, Iran.
[3] Associated PhD, Department of Physical Therapy, Medical Sciences Faculty, Tarbiat Modares University.

** Correspondence*
Address: Jalal Al Ahmad Ave, Nasr Bridge, Tarbiat Modares University, Tehran, Iran.
Tel: +98(21) 82884547
Mobile: 09122876439
Fax: +98 (21) 82884555
Post Box 14115-111.
Email: tavafian@modares.ac.ir

Article History
Received: Oct 5, 2019
Accepted: Jan 13, 2020
ePublished: Feb 23, 2020

ABSTRACT

Aims: This study aimed to investigate the efficacy of educational intervention on sitting posture in female student studying in high school in Izeh, Iran.
Instruments and Methods: Current study was performed in two schools in Izeh city of Iran. Ethical approval and informed consent was obtained from the participants. One hundred and forty six (N=146) participants from these schools were randomly allocated to an intervention (n = 73) or control group (n = 73). The intervention included two group-based sessions. The control group received usual educational. Data collection was conducted by Nordic questionnaire and a researcher– made questionnaire. Data were analyzed by SPSS 16 software, using independent t-test and Chi-square test.
Findings: The mean age of participants in this study in the intervention and control groups were 16.15 ± 0.88 and 15.95 ± 0.81 years respectively. The intervention group had significant improvements compared with the control group. In intervention group significant differences were found in score of knowledge, attitude and sitting behavior before and after of intervention (P<0.05).
Conclusions: This study showed that educational intervention was effective in improving proper sitting and maintaining the status of the spine.

Keywords: Musculoskeletal Disorder, Posture, Knowledge, Attitudes, Practice.

Introduction

Physical status is an important public health issue and also an important risk factor in developing debilitating conditions during adulthood. Many body condition problems, especially those related to the spine, originate in the developmental period of childhood and adolescence. Prolong sitting at schoo; could change some posture-metric variables of schoolchildren[1]. Low Back Pain (LBP) is common among adolescents and it has been estimated that one-fifth of adolescents suffer from recurrent severe LBP. However, longitudinal studies describing the risk factors of LBP are scarces [2]. Throughout studying in school, the child is changed physically, mentally, emotionally and socially. In 2014 the Danish government applied changes in several aspects of physical activity promotion perspective [3]. It has been argued that if the changes were not provided with the right environment for growth and development of adolescents, they will suffer from developmental disabilities and childhood illnesses during their learning period. With this regard, the education process not only poses significant obstacles, but also forms the basis of many physical and mental illnesses and disorders in adulthood [3,4].

Students spend a lot of time in sitting position on the couch at school. Sitting in an incorrect position causes high pressure on muscles, ligaments, lumbar joints, intervertebral discs and other muscles [5]. Although, these abnormalities are possible at any age but at early ages in

**Corresponding Author:* No 212, Health Education and Health Promotion Department, Medical Sciences Faculty, Tarbiat Modares University , Jalal Al Ahmad Ave, Nasr Bridge, , Tehran, Iran. Phone: +98(21) 82884547. Email: tavafian@modares.ac.ir

[DOR: 20.1001.1.24765279.2019.4.4.5.9]
[DOI: 10.52547/ijmpp.4.4.263]

adolescents are more probable due to lack of maturation of the musculoskeletal system and high degree of flexibility and formation. In addition to increasing the likelihood of these complications, there is more progress and, ultimately, more consolidation during early ages of lives.

Demographic studies have shown that children and adolescents often complain of LBP. Accordingly, a study conducted in Spain among 16,357 participants aged 13-15 years, verified that more than half of participants suffer from back pain at least once during past year [6]. In another study among students, it was shown that backbone disorders were highly prevalent [7]. This study verified that spending long time sitting position, psychosocial problems, doing exercise, obesity and sedentary life style have been possible risk factors for LBP among children [7]. Inappropriate situations, inappropriate bench and chair design, long sitting time have been the risk factors of abnormal situations in students. The results showed that due to the impact of school-age students on how to sit properly, learning to sit properly can be a turning point for their learning and minimizing the incidence of future discomfort and complications. Since one of the responsibility of the education system is to maintain and promote health of the students airing school period, this is important to provide mentally and physically safe and joyful environment in schools [8]. In this regard, this study aimed to investigate the efficacy of educational intervention on sitting posture in female student studying in high school in Izeh, Iran.

Instruments and Methods

This was a randomized controlled trial study with random cluster sampling. The study was conducted in Izeh, Iran between January and May 2017, and comprised 146 students who randomly allocated to experimental group (N=73) and control group (N=73). The statistical population of this study was selected through simple random sampling. In this study, a researcher-made questionnaire was developed for students' knowledge, attitude and behavior. Due to lack of standard questionnaires regarding knowledge, attitude and proper behavior in terms of sitting posture, first, through literature reviewing, related questions were prepared and assessed by ten relevant specialists in the fields of health education, physiothery, and ergonomics. Reliability of the questions was assessed through Cronbach's alpha and kappa coefficient that was 0.87. The questionnaire was compiled in three parts: The first part of questions was about knowledge domain which Include 12 items and was scaled with points (yes = 2, I do not know = 1 and no = 0).The maximum score of this section was 24. In this case, each student who has a higher score of this domain has more knowledge about correct posture of sitting.

The second part of the questionnaire included 6 questions in the domain of attitude and in the form of a Likert spectrum of 3 options with score (I agree = 3, I have no idea = 2, I disagree = 1). The maximum score earned in this section was 18, and the highest level of attitude about sitting was related to someone who had a score of 18 with the most optimal attitude.

Finally, the third part of the questionnaire included five items and was about observational behavioral checklist with options of (yes = 1 and no = 0). The maximum score that was earned in this part was considered 5, and the score five meant sitting behavior was quite correct.

All participants, who agreed to participate in this study, were provided written informed consent. All participants were volunteers and met the following criteria as being female student and studying in high school.

[DOR: 20.1001.1.24765279.2019.4.4.5.9]
[DOI: 10.52547/ijmpp.4.4.263]

After selecting the experimental and control groups, both groups were pre-tested, and then based on the results of the pre-test, the educational program was developed. The experimental group was divided into 7 groups with 10 students in each group to obtain educational intervention. Three training sessions were included in the program. First session was conducted through lecture to raise awareness of the participants, the second session involves group with discussions and questioning / answering for changing attitudes of the participants and the third session included skill training trough role play and displaying slides and also screenplay for how to sit properly on the bench while listening to the lesson.

Immediately after educational intervention and three months later, both groups completed the questionnaire in order to compare the mean scores of knowledge, attitude and behavior before, immediately and three months after intervention, in the experimental and control groups.

To analyze data, Kolmogorov-Smirnov test was used to examine the normality of data in the experimental and control groups. Then, both groups were analyzed by SPSS software through independent t-test and paired t-test [9, 10]. In both experimental and control groups, the P-value was considered less than 0.05 as significant result.

Findings

Totally 146 participants including 73 students in intervention and 73 participants in control group took part in the study. The mean age of participants in the intervention and control groups was 16.15 ± 0.88 and 15.95 ± 0.81 years respectively. Table 1 shows the comparison of the two groups in terms of demographic data at baseline.

Relationship between demographic

Table 1 Comparison of the status of the experimental and control groups in terms of demographic variables

Variable	Group	Mean (SD)	Minimum	Maximum	P-value
Age	Experimental	15.16 (0.88)	14	19	0.179
	Control	15.95 (0.81)	15	18	
Weight	Experimental	54.36 (6.99)	40	70	0.244
	Control	55.36 (8.26)	40	82	
Height	Experimental	148.69 (5.59)	148	180	0.052
	Control	163.69 (5.04)	150	176	
BMI	Experimental	20.38 (2.60)	18.25	27.60	0.992
	Control	20.33 (2.81)	14	20.48	

[DOR: 20.1001.1.24765279.2019.4.4.5.9]
[DOI: 10.52547/ijmpp.4.4.263]

variables and knowledge, attitude and sitting posture behavior was shown in Table 2.

Comparison of knowledge, attitude and behavior before, immediately and three months after the intervention is shown in Table 3.

Discussion

Table 2 Relationship between demographic variables with knowledge, attitude and sitting behavior

Variables	Knowledge	Attitude	Behavior
Age	<0.0001	<0.0001	<0.0001
Height	0.32	0.34	0.85
Weight	0.34	0.85	0.17
BMI	0.72	0.74	0.44
Residence region	0.62	0.42	0.92
Father's education	0.43	0.05	0.63
Mother's education	0.04	0.05	0.04
Father's job	0.53	0.23	0.80
Mother's job	0.06	0.009	0./59
Economic situation	0.009	0.001	0.01
Sports activities	0.29	0.53	0.36
Out-of-school activities	0.29	0.13	0.20
Type of activity	0.95	0.43	0.93

Table 3 Comparison of knowledge, attitude and behavior before, immediately and three months after the intervention

Domain	Pretest		Post-test (Mean±SD)		Follow- up (Mean±SD)		P-value (T-test)		
	Int. group	(Mean±SD)	Int. group	Con. group	Int. group	Con. group			
knowledge	10.9±3.2	11.3±2.8	19.5±2.4	11.6±2.9	16.1±2.2	10.5±2.7	0.45	<0.001	<0.001
attitude	8.8±1.7	9.2±1.6	15.4±1.8	9.0±1.9	13.0±1.6	8.9±1.9	0.14	<0.001	0.0003
behavior	0.9±0.8	1.02±0.7	4.1±0.7	0.9±0.8	2.9±8.4	1.04±0.8	0.59	<0.001	<0.001

[DOR: 20.1001.1.24765279.2019.4.4.5.9]
[DOI: 10.52547/ijmpp.4.4.263]

[DOR: 20.1001.1.24765279.2019.4.4.5.9]

[DOI: 10.52547/ijmpp.4.4.263]

The purpose of this study was to investigate the effect of a designed educational intervention on siting posture behavior of female high school students in Izeh city. Based on the results of this study, the mean scores of knowledge, attitude and behavior before and after the intervention in the experimental group had a significant difference compared to the pre intervention. Findings from demographic variables indicate that there was no difference between the two variables in both the experimental and control groups. The results of this study regarding students' knowledge, attitude and behavior showed that the scores of these three domains in the experimental and control groups at the beginning of the study were almost the same and did not differ significantly. However, these differences were significant immediately and three months after the intervention. Based on the results of current study, the implementation of educational intervention could significantly increase the level of knowledge, attitude and also improve behavior of students in the experimental group. However, there were no significant differences in terms of knowledge, attitude and behavior of students in the control group before, immediately and 3 months after intervention.

The findings of this study showed the positive effect of the educational program on improving knowledge, attitude and behavior regarding the correct posture of sitting. These results are consistent with the findings of more or less similar studies conducted in other countries. Park and colleagues showed that knowledge and self-efficacy of the participants in intervention group were significantly higher than the control group. However, changes in spinal health were not significantly altered in both groups [11]. In current study, by increasing knowledge of students and also improving their attitude through discussion and questioning / answering , the correct siting posture behavior of the students were significantly improved.

Syazwan's study showed that students who had ergonomic learning intervention showed a significant improvement in their sitting position in the classroom and weight loss in the school bag compared to the control group [12]. In this regard, present study, with a focus on all three cognitive, emotional and behavioral domains, has positively impacted education. Geldhof's study showed that students who had found the right spinal vertebra in the primary school had a better understanding of the principles of getting up and correctly sitting posture [9].

Fabianat's study showed that the program of prevention of musculoskeletal disorders would increase the level of students' knowledge and would be highly effective [13]. The educational method in current study was also based on the results of the pre-intervention phase, and since not only our goal was to increase student knowledge, but also to change the attitude. Meanwhile, the effect of education regarding skill improvement was doubled with using the role play method.

In addition, a three-month follow-up also showed the positive impact of training, and further improved skill. Based on the results of this study, there was a significant relationship between the demographic variables between mothers' education and students' knowledge and behavior .Mothers' job had a significant relationship with the attitude of the students, Therefore, it seems that students who have mothers with lower education or lower economic status should be paid more attention by the system.

Considering the findings of this study and the low level of knowledge, attitude and behavior in high school students, it is important to pay attention to the unfavorable position of the students regarding their

sitting posture in the classroom and in different times of listening, writing and reading. Because neglect of this risk factor of musculoskeletal problem could be resulted in irreparable complications. Therefore, in order to improve the position of the sitting position and prevent other complications arising from it, the necessary of training correct sitting position are recommended among this group of students.

Conclusions

According to the findings of the present study, the impact of the training program can have a very effective role in reducing or preventing the consequences of sitting in the wrong posture.. Therefore, it seems that students with lower education or lower economic status should be paid more attention regarding their sitting position to prevent irreparable musculoskeletal complications. It is recommended that these students be provided with the necessary education and training regarding correct sitting posture.

Acknowledgments

This research is part of the dissertation of the Master of Science in Health Education and Health Promotion Department and Department of Physical Therapy of Tarbiat Modares University. The authors hereby announce their gratitude and appreciation to all those who contribute to the research.

Ethical Permissions: This study approved by ethics commeetee of Tarbiat Modares University through ethical code of IR.TMU. REC.1396.663.

Conflict of Interests: The authors declare that they have no conflict of interest.

Authors Contribution: SN (First author) conducted all parts of the study (50%), SST (Corresponding Author) supervised the study (40%) and SK (Second author) advised the study (10%).

Funding: This research supported financially by Tarbiat Modares University (TMU)

References

1. Guelfi R, Conti M, Zanfrini S, Brunelli M, Traina G. Postural Disorders Produced by School Furniture on a Population of a Junior High School. Arch Ital Biol. 2019;157(1):15-23. doi: 10.12871/00039829201912.
2. Mattila VM, Saarni L, Parkkari J, Koivusilta L, Rimpelä A. Predictors of low back pain hospitalization--a prospective follow-up of 57,408 adolescents. Pain. 2008;139(1):209-17. doi: 10.1016/j.pain.2008.03.028.
3. Pedersen NH, Koch S, Larsen KT, Kristensen PL, Troelsen J, Møller NC,et al. Protocol for evaluating the impact of a national school policy on physical activity levels in Danish children and adolescents: the PHASAR study - a natural experiment. BMC Public Health. 2018;18(1):1245. doi: 10.1186/s12889-018-6144-8.
4. Nylund T, Mattila VM, Salmi T, Pihlajamäki HK, Mäkelä JP. Recovery of brachial plexus lesions resulting from heavy backpack use: A follow-up case series. BMC musculoskeletal disord. 2011;1262. doi: 10.1186/1471-2474-12-62.
5. Heidarimoghadam R, Motamedzade M, Roshanaei G, Ahmadi R. Match between school furniture dimensions and children's anthropometric dimentions in male elementary schools. J Ergon. 2014; 2 (1) :9-18.
6. Sobhani A, Akbari M. Body Posture of Ghaem Motlagh Primary School Students. J Ardabil Univ Med Sci. 2005; 5 (4) :340-346 URL: http://jarums.arums.ac.ir/article-1-572-fa.html.
7. Kord R, Rostami M. Low Back Pain in Children and Adolescents: an Algorithmic Clinical Approach. Iran J Pediatr. 2011; 21(3): 259–270.
8. Tirgar A, Aghalari Z, Salari F. Musculoskeletal disorders ergonomic considerations in computer use among medical sciences students. J Ergon. 2014; 1 (3) :55-64
9. Geldhof E, Cardon G, De Bourdeaudhuij I, De Clercq D. Back posture education invelementary schoolchildren: a 2-year follow-up study. European spine Journal. 2007; 16(6): 841-50.
10. Chaffin DB, Andersson GBJ., Martin BJ. Occupational Biomechanics, 4th Edition; 2006. Willy ISBN: 978-0-471-72343-1 PP: 1-376.
11. Park JH, Kim JS. Effects of spinal health educational programs for elementary school children. Journal for specialists in Pediatric nursing. 2011;16(2):121-9.
12. Syazwan, AI., Azhar, MM., Anita, AR., Azizan, HS., Shaharuddin, MS, et al. Poor sitting posture and a heavy schoolbag as contributors to

[DOR: 20.1001.1.24765279.2019.4.4.5.9]
[DOI: 10.52547/ijmpp.4.4.263]

musculoskeletal pain in children: an ergonomic school education intervention program. J Pain Res; 2011; 4: 287.96.
13. Foltran FA, Moreira RF, Komatsu MO, Falconi MF, Sato TO. Effects of an educational back care program on Brazilian schoolchildren's knowledge regarding back pain prevention. Braz J Phys Ther 2012; 16(2):128-33.

[DOR: 20.1001.1.24765279.2019.4.4.5.9]
[DOI: 10.52547/ijmpp.4.4.263]