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Comparison of Students' knowledge about Spinal Disorders Preventive Behaviors

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ABSTRACT

Aim: Back pain is one of the arising musculoskeletal disorders among the children population. The purpose of this study was to compare students' knowledge about spinal disorders preventive behaviors"

Method and Materials: This study was a school-based clinical trial among 104 fifth grade female students. The intervention group (N = 52) received six training sessions once a week and the control group (N=52) did not receive any intervention. Data was collected using the self-reported questionnaire include demographic information and back care knowledge at baseline, immediately, 3- and 6-months follow-ups. Data were analyzed using SPSS software version 24. Descriptive analysis, chi-square test, independent t-test. repeated measure analysis of variance and Friedman test were applied to evaluate the results. Significance level was set at $p \leq 0.05$.

Findings: The results demonstrated that there was a significant interaction between 'group' and 'test time' factors ($p < 0.001$), with higher score for the intervention group (36.4% improvement for the knowledge test score). By contrast, the control group didn't have significant higher mean score of knowledge from the pre-test to follow-up assessments.

Conclusion: The effectiveness of intervention on back care related knowledge was demonstrated in this study. Further evaluation is required to examine other determinants of promoting back-related behavior.

Keywords: Back Pain, Educational Program, Knowledge, School Children

Introduction

All over the world, back pain and neck pain are the most common public health problems which cause adult disability[1, 2]. Back pain is an issue that people do not perceive and so ignore its role and impact on a their life [3]. Although in adults, the heavy burden of disability due to back pain has been proven, in children the consequences are not well documented [4]. It is predicted that suffering from back pain at a young age will cause chronic disease and cause continues back pain in adulthood [5]. In other words, the occurrence of back pain in childhood is one of the effective risk factors for continuing it in adulthood [6]. Back and neck pain were ranked 1st and 4th years of disability among their injuries and chronic acute illnesses, respectively, according to the World Health Organization's "Disease Burden" report from 188 countries published in 2015 [7]. Recent research has shown that back pain is also an important cause of disability in children and adolescents and its frequency is increasing among this population; In addition, the development of back pain at an early age plays a significant role in its development in adulthood [4, 8, 9]. Previous studies have shown that the prevalence of back pain in childhood and adolescence varies from 7 to 74% [9, 10]. In addition, our previous study has revealed that 23.6% of fifth-grade female elementary school children (n=144) reported back

pain during last week [11]. The cause of back pain in children - like other ages - are due to a variety of physical and psychological factors; Such as: Improper methods of lifting and carrying heavy objects, improper physical posture during daily life activities, use of heavy backpacks and improper handling, inactivity and physical incompatibility, hunchbacked girls especially in adolescence as well as factors such as anxiety and depression [1, 4, 7, 12]; which among them, behavioral risk factors are very important [13]. Teaching the principles of spine care in elementary schools can be very effective in preventing back pain; where access to a high percentage of the target population is possible but not much has been done [14]. Based on Social Cognition Models (SCMs; Conner and Norman, 2005), the personal health cognitions, such as knowledge, have significant role to obtain health-related behaviors [15, 16]. Therefore, the aim of the present study was to comparison of students' knowledge about preventing behaviors to keep right spinal posture in the fifth grade of female elementary school in district 22 of Tehran, Iran.

Method and Materials

This study was conducted as a clinical trial among public female elementry schools in Tehran's 22nd district in September 2016. A simple random sampling method (lottery) was used. First, a list of female elementary schools was prepared, which consisted of 8 schools. Then, the numbering of the schools was done and the numbers were placed in a container. Since individual assignment was not possible in the schools, the classes of each school (a total of 4 fifth grades in the school) were numbered and two classes from each school were selected by lottery. Finally, a total of 104 female fifth grade students entered the study for the intervention group (n = 52) and the control group (n = 52). After being informed of the purpose of the study, a written consent to the parents for the student's participation and the informed consent and voluntary participation of the student in the present study was made. The education program for the intervention group (n = 52) was performed in six sessions, one session per week. The educational content included the correct methods of lifting and carrying heavy objects, having a proper physical condition during daily activities and how to use a backpack. The control group (n = 52) did not receive any educational intervention during this period but after the last follow-up data collection they were given simple training. Data collection tools included a self-report questionnaire with demographic characteristics and back care knowledge questions embedded in it. Back care knowledge questions consisted of ten questions with a score of zero for the incorrect and unanswered options and a score of one for the correct option. Data were collected before, immediately, three and six months after training in both interventional and control groups . Descriptive analysis and chi-square test as well as two-way analysis of variance, Friedman and independent t-test were used to analyze data through SPSS version 24. Significance level was set at $p \geq 0.05$.

Findings

Totally 104 students with age of 11 years old took part in the study and completed the questionnaires. Table 1 shows the rest demographic characteristics of them. Table 2 shows the distribution and comparison of frequency of answers to knowledge questions in the intervention and control groups over times. According to the results of table 2, there is no statistically significant difference in the frequency distribution of the score of knowledge variable questions

Table 1) Demographic characteristics of the studied participants of both groups

Variables	Intervention group (n = 52)	Control group (n = 52)	P value
Father's job	N (%)	N (%)	
Employed	45 (86.6)	47 (90.4)	0.37
Unemployed	4 (7.7)	1 (1.9)	
Retired	3 (5.8)	3 (5.8)	
Mother's job			
Employed	16 (30.8)	13 (25)	0.51
Housewife	36 (69.2)	39 (75)	
Father's education			
Illiterate - Elementary	1 (1.9)	1 (1.9)	0.80
Diploma	35 (67.3)	38 (73.1)	
University	16 (30.8)	13 (25)	
Mother's education			
Illiterate - elementary	2 (3.8)	4 (7.7)	0.69
Diploma	32 (61.5)	30 (57.7)	
University	18 (34.6)	18 (34.6)	
Birth rank			
First	30 (57.7)	25 (48.1)	0.58
Second	17 (32.7)	20 (38.5)	
Other	5 (9.6)	7 (13.5)	
Number of family members			
Three people	7 (13.5)	10 (19.2)	0.43
Four people	36 (69.2)	27 (51.9)	
Five people	9 (17.26)	15 (28.8)	
Housing situation			
Rent	21 (40.4)	18 (34.6)	0.54
Own	31 (59.6)	34 (65.4)	
How to get to and from school			
On foot	3 (5.8)	13 (25)	0.19
Public transportation	5 (9.6)	2 (3.8)	
School service	15 (28.8)	22 (42.3)	
private car	29 (55.8)	15 (28.8)	

Table2) Comparison of answers distribution to knowledge questions in the intervention and control groups over time

Time	Baseline		Immediately follow up		3-month follow up		6-month follow up				
Score	zero	one	zero	one	zero	one	zero	one	χ^2	df	P Value*
Knowledge	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)			
Question 1											
(n=52) Control	31 (59.6)	21 (40.4)	29 (55.8)	23 (44.2)	34 (65.4)	18 (34.6)	26 (50.0)	26 (50.0)	3.037	3	0.39
(n=52) Intervention	29 (55.8)	23 (44.2)	11 (21.2)	41 (78.8)	12 (23.1)	40 (76.9)	11 (21.2)	41 (78.8)	23.553	3	**>0.001**
Question 2											
(n=52) Control	5 (9.6)	47 (90.4)	6 (11.5)	46 (88.5)	6 (11.5)	46 (88.5)	5 (9.6)	47 (90.4)	0.138	3	0.98
(n=52) Intervention	7 (13.5)	45 (86.5)	-	52 (100)	2 (3.8)	50 (96.2)	1 (1.9)	51 (98.1)	21.220	3	**>0.001**
Question 3											
(n=52) Control	3 (5.8)	49 (94.2)	5 (9.6)	47 (90.4)	6 (11.5)	46 (88.5)	4 (7.7)	48 (92.3)	1.568	3	0.67
(n=52) Intervention	6 (11.5)	46 (88.5)	6 (11.5)	46 (88.5)	5 (9.6)	47 (90.4)	5 (9.6)	47 (90.4)	1.389	3	0.71
Question 4											
(n=52) Control	28 (53.8)	24 (46.2)	27 (51.9)	25 (48.1)	30 (57.7)	22 (42.3)	31 (59.6)	21 (40.4)	0.802	3	0.84
(n=52) Intervention	30 (57.7)	22 (42.3)	12 (23.1)	40 (76.9)	10 (19.2)	42 (80.8)	8 (15.5)	44 (84.6)	32.069	3	**>0.001**
Question 5											
(n=52) Control	35 (67.3)	17 (32.7)	36 (69.2)	16 (30.8)	36 (69.2)	16 (30.8)	37 (71.1)	15 (28.8)	0.133	3	0.98
(n=52) Intervention	38 (73.1)	14 (26.9)	22 (42.3)	30 (57.7)	20 (38.4)	32 (61.5)	22 (42.3)	30 (57.7)	17.512	3	**>0.001**

Continuation of Table 2.

Time	Baseline		Immediately follow up		3-month follow up		6-month follow up				
Score	zero	one	zero	one	zero	one	zero	one	χ^2	df	P Value*
Knowledge	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)			
Question 6											
(n=52) Control	38 (73.1)	14 (26.9)	38 (73.1)	14 (26.9)	37 (71.1)	15 (28.8)	38 (73.1)	14 (26.9)	0.053	3	0.99
(n=52) Intervention	40 (76.9)	12 (23.1)	28 (53.8)	24 (46.2)	27 (51.9)	25 (48.1)	25 (48.1)	27 (51.9)	11.636	3	**>0.009**
Question 7											
(n=52) Control	46 (88.5)	6 (11.5)	46 (88.5)	6 (11.5)	48 (92.3)	4 (7.07)	47 (90.4)	5 (9.6)	0.601	3	0.89
(n=52) Intervention	49 (94.2)	3 (5.8)	7 (13.5)	45 (86.5)	10 (19.2)	42 (80.8)	11 (21.1)	41 (78.8)	102.00	3	**>0.001**
Question 8											
(n=52) Control	30 (57.7)	22 (42.3)	27 (51.9)	25 (48.1)	26 (50.0)	26 (50.0)	32 (61.5)	20 (38.5)	1.689	3	0.64
(n=52) Intervention	28 (53.8)	24 (46.2)	7 (13.5)	45 (86.5)	10 (19.2)	42 (80.8)	7 (13.5)	45 (86.5)	34.428	3	**>0.001**
Question 9											
(n=52) Control	38 (73.1)	14 (26.9)	39 (75.2)	13 (25)	41 (78.8)	11 (21.1)	38 (73.1)	14 (26.9)	0.669	3	0.88
(n=52) Intervention	38 (73.1)	14 (26.9)	12 (23.1)	40 (76.9)	9 (17.3)	43 (82.7)	9 (17.3)	43 (82.7)	55.899	3	**>0.001**
Question 10											
(n=52) Control	43 (82.7)	9 (17.3)	42 (80.8)	10 (19.2)	43 (82.7)	9 (17.3)	40 (76.9)	12 (23.1)	0.844	3	0.84
(n=52) Intervention	39 (75)	13 (25)	25 (48.1)	27 (51.9)	21 (40.2)	31 (59.6)	23 (42.2)	29 (55.8)	16.724	3	**>0.001**

Table3) Mean and standard deviation of knowledge variable in intervention and control groups over times

Time	Baseline	Immediately follow up	3-month follow up	6-month follow up	P Value* Within group
Group	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	
Control	4.30± 1.46 n =52	4.161±0.61 n =49	4.16± 1.53 n =50	4.35± 1.65 n=48	0.78
Intervention	4.16± 1.53 n =52	7.45± 1.83 n =51	7.82±1.81 n =50	7.80±1.84 n =51	**<0.001**
P Value** Between group	0.59	<0.001	<0.001	<0.001	

*Repeated Measure Analysis of Variance test, significance level less than 0.05 is considered.
**Independent t-test, has a significance level of less than 0.05.

Table 4) Multiple comparisons of the knowledge mean score in intervention group over time

Time1	Time2	Mean Difference	P value*	95% Confidence Interval for Difference	
				Lower Bound	Upper Bound
	Immediately follow up	- 1.577	<0.001	- 2.041	- 1.113
Baseline	3-month follow up	- 1.760	<0.001	- 2.224	- 1.296
	6-month follow up	- 1.849	<0.001	- 2.314	- 1.384
Immediately follow up	3-month follow up	- 0.183	0.29	- 0.647	0.281
	6-month follow up	- 0.272	0.41	- 0.737	0.193
3-month follow up	6-month follow up	- 0.089	0.75	- 0.554	0.376

*Significance level less than 0.05 is considered.

between the control and intervention groups before the intervention, but at other times there is a difference. Moreover, there is no statistically significant difference in the frequency distribution of scores of variable knowledge questions in the control group at different times. However, due to the P value, which is less than 0.05, there is a statistically significant difference in the frequency distribution of the score of the variable knowledge questions of the intervention group at different times. The only question to which the percentage of answers before and after the intervention did not differ between the two groups, i.e., the main and interaction effect between the group and time was not significant (control group: p = 0.67 and intervention group p = 0.71) was the question number 3 titled "Which is the most appropriate way to carry a backpack? (Right

option: on two shoulders). Table 3 shows the Mean and standard deviation of knowledge variable. According to these results, there is no statistically significant difference in the mean knowledge score between the two groups of control and intervention before intervention, but at other times there is a significant difference. Also, there is no statistically significant difference in the average knowledge score of the control group at different times; however, due to the P value, which is less than 0.05, there is a statistically significant difference in the average knowledge score of the intervention group at different times (P<0.001, F=29.395). Table 4 shows multiple comparisons of the knowledge mean score of intervention group over time. According to these results, the mean knowledge score of the intervention group was significantly different before the intervention with immediate, three- and six-months follow-up (P <0.001, = 0.21). But there is no statistically significant difference in the mean knowledge score of the control group between immediate, three- and six-month follow-up.

Discussion

The present study was conducted with the aim of "comparison of students' knowledge about spinal disorders preventive behaviors'' Findings of the study showed that the educational program significantly increased the mean score of knowledge of the intervention group and its persistence during follow-up, in comparison, the control group did not have a significant difference in the knowledge mean score before and after the program. Post hoc test showed that there was a significant difference between the mean scores of the intervention group before the intervention and the next time periods, but this was not the case between the mean of the three time periods after the training program. The results of independent t-test also showed a significant difference between the two groups in the time periods after the intervention.

In this study, the main and interaction effects of group and time on the knowledge variable were significant. The intervention group had an average of 34.6% improvement in spinal care knowledge compared to before the intervention; While the control group did not show any improvement in spinal care knowledge. As a result of the training program, students were able to gain the necessary knowledge about the principles of spine care and how to prevent back pain. These results are better than previous research findings. Findings of Heiser et al [14] regarding the effect of "back pain prevention principles training program on knowledge and performance of spine care in fifth grade elementary students" showed that by teaching these principles to sports teachers, the knowledge of the intervention group was improved by 10%. Also the results of the study of Cardon et al [17] showed that with the implementation of back pain prevention education program in primary schools, the knowledge of the intervention group (347 people) compared to the control group (359 people) has improved by 15%. The reason for achieving a better result in the present study may be the use of special and diverse strategies based on cognitive-social theory to improve the knowledge of spinal care. Geldhof et al. In their study [18] aiming to evaluate the effect of the training program on the prevention of back pain in adolescents aged 13-14 years, showed that after 2 years of follow-up, general and specific knowledge of spinal care was significantly better in the intervention group than the control group. Also the results of research by Dolphens et al [19] found that after 1 and 8 years of follow-up, the back pain prevention training program in 9-11 year old students improved the knowledge of the intervention group (96

people), While the control group (98 people) did not have a significant increase in spinal care knowledge. The important point of the mentioned studies was the persistence of improving the knowledge of the participants in a long period of time. The effect of the present intervention on the improvement of knowledge was in line with the results of the above studies and contrary to the findings of Santos et al [20] This study showed that there was no significant difference in knowledge scores before and after the intervention on 38 elementary children aged 8-12 years. Perhaps the reason was the insufficient sample size, the study was designed in a single group and before and after.

Conclusion

The results of the study showed that the training program played an important role in improving the behavior of the experimental group (32% increase). Due to the time constraints of the present study, it is suggested that long-term follow-up (2 to 8 years) be considered in future studies to evaluate the persistence of the study variable improvement.

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Authors' Contribution: ZAC was the main investigator, collected and analyzed the data. FMB wrote the first draft. SST supervised the study and contributed to all aspect the study. AM was study advisor and contributed to analysis, interpretation and writing process. FMB wrote the first draft. All authors read and approved the final manuscript.

Conflicts of Interests: The authors declare that they have no conflicts of interests.

Ethical Permission: The study was registered by the ethics committee of TMU with the code IR.TMU.REC.1396.727. It was in accordance with the Helsinki Declaration. All pupils and their parents were informed regarding aim and procedures of the study and consent form was signed by parents/ legal guardians on behalf of their children

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References

1. Dullien S, Grifka J, Jansen P. Cluster-randomized, controlled evaluation of a teacher led multi factorial school based back education program for 10 to 12-year old children. BMC Pediatr. 2018;18(1):doi.org/10.1186/s12887-018-1280-y.
2. Natasha AA, Syukri AA, Diana MKSN, Ima-Nirwana S, Chin K-Y. The association between backpack use and low back pain among pre-university students: A pilot study. JTUSCI . 2018;13(2):205-9.
3. Hossain F, Tonima MA. A Study on the Effects of Heavy Backpack and Development of a Preventative Prototype. J. Sens. 2017; doi. org/10.1155/2017/9419373
4. Kamper SJ, Yamato TP, Williams CM. The prevalence, risk factors, prognosis and treatment for back pain in children and adolescents: an overview of systematic reviews. Best Pract. Res.: Clin. Rheumatol. 2016;30(6):1021-36.
5. Aprile I, Di Stasio E, Vincenzi MT, Arezzo MF, De Santis F, Mosca R, et al. The relationship between back pain and schoolbag use: a cross-sectional study of 5,318 Italian students. Spine J. 2016;16(6):748-55.
6. Ilbeigi S, Kabootari A, Afzalpour M, Farzaneh H. The relationship between sitting posture and musculoskeletal pain in boy elementary school students. Iran J Ergon. 2017;5(3):41-9.
7. Kamper SJ, Henschke N, Hestbaek L, Dunn KM, Williams CM. Musculoskeletal pain in children and adolescents. BJPT. 2016; 20(3):275-284.
8. Dianat I, Alipour A, Jafarabadi MA. Multigroup latent class model of musculoskeletal pain combinations in children/adolescents: identifying high-risk groups by gender and age. J. Headache Pain. 2018;19(1): 52: doi.org/10.1186/s10194-018-0880-0.
9. Khanzada S, khanzada SK, khan MS, shaikh S,

mirza RA, Naaz E, et al. Revalence of backache among school going children of hyderabad, sindh. IJPHY. 2016; 3(1): 11-4.
10. Dianat I, Alipour A, Jafarabadi MA. Prevalence and risk factors of low back pain among school age children in Iran. HPP. 2017;7(4): 223-229.
11. Akbari-Chehrehbargh Z, Tavafian SS, Montazeri A. Assessing Back Pain , Healthy Back Behavior and its Cognitive Determinants among Pupils in Iran. IJMPP. 2018;3(4): 114–21.
12. Brzęk A, Dworrak T, Strauss M, Sanchis-Gomar F, Sabbah I, Dworrak B, et al. The weight of pupils' schoolbags in early school age and its influence on body posture. BMC Musculoskelet. Disord. 2017; 18 (117): doi:10.1186/s12891-017-1462-z.
13. Rosa BNd, Furlanetto TS, Noll M, Sedrez JA, Schmit EFD, Candotti CT. 4-year longitudinal study of the assessment of body posture, back pain, postural and life habits of schoolchildren. Motricidade. 2017;13(4):3-12.
14 Heiser SL. Effects of a Back Pain Prevention Education Program on Knowledge of Proper Back Care Among Fifth Grade Elementary Students: Middle Tennessee State University; 2014.
15. Croyle RT. Theory at a Glance (Second Edition). reateSpace Independent Publishing Platform; 2nd edition (June 8, 2012) · Language : English. Paperback : 62 pages. ISBN-10: 147762399X
16. Glanz k, Rimer BK, Viswanath K. Health Behavior and Health Education, Theory, Research, and Practice. 2008. Jossey-Bass Public Health. reateSpace Independent Publishing Platform; 2nd edition (June 8, 2012). Language: English. Paperback: 62 pages. ISBN-10: 147762399X.
17. Cardon G, De Bourdeaudhuij I, De Clercq D. Knowledge and perceptions about back education among elementary school students, teachers, and parents in Belgium. J. Sch. Health . 2002;72(3):100-6.
18. Geldhof E, Cardon G, De Bourdeaudhuij I, De Clercq D. Back posture education in elementary schoolchildren: a 2-year follow-up study. Eur. Spine J. 2007;16(6):841-50.
19. Dolphens M, Cagnie B, Danneels L, De Clercq D, De Bourdeaudhuij I, Cardon G. Long-term effectiveness of a back education programme in elementary schoolchildren: an 8-year follow-up study. Eur. Spine J. 2011;20(12):2134-42.
20. Dos Santos NB, Sedrez JA, Candotti CT, Vieira A. Immediate and follow-up effects of a posture education program for elementary school students. Rev. Paul. Pediatr. 2017; 35(2): 199-206.