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Assessing Back Pain, Healthy Back Behavior and its Cognitive Determinants among Pupils in Iran.

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ABSTRACT

Aims: Back pain is an important public health problem and the leading cause of adult disability in the worldwide; that is on the rise among the adolescent population. This study concentrated on assessing the back pain, healthy back behavior and its cognitive determinants among 5th–grade girls in Iran.

Instruments & Methods: This was a cross-sectional school-based study conducted in capital Tehran`s region 22, through the convenience sampling of 610 pupils. A self-reported questionnaire was used to assess demographic information, back care knowledge, self-efficacy, fear-avoidance beliefs, and behaviours. Descriptive statistical analysis included frequency and percentage. Crosstabs and chi-square tests were used to broadly assess the data related to the presence of back pain and identify factors associated with back pain. The data was analyzed by SPSS.

Findings: In all 610 fifth-grade female elementary school children were entered into the study. The results showed that 23.6% of pupils (n=144) reported back pain during last week. In addition, only 1.8%, 33%, 18.5%, and 31.6% of participants had a high level of the back care knowledge, self-efficacy, belief, and behavior respectively. There was a significant relationship between the back pain and back behavior (P=0.004); and between back pain and self-efficacy (p<o.oo1).

Conclusions: This study concluded that healthy back behavior as well as its main determinants should be enhanced among pupils.

Keywords: Cognitive Determinants, Healthy Back Behaviour, Back pain , Pupils.

Introduction

Back pain is an important public health problem and the leading cause of adult disability in the worldwide, that is on the rise among the adolescent population [1,2]. Although the burden of back pain in adult has been well proved, its consequences in children are not so well recognized. According to WHO statistics in 2015, back pain ranks 9th in years lived with disability in 10- to 14-year-olds and 4th in 15- to 19-year-olds, even much higher than 'non-communicable' diseases such as cancer and anxiety disorders. However, that is a best reason for concern about the impact of back pain on children and adolescents around the world [3]. Likewise, back pain at a young age is considered to be predictive of chronicity in adulthood [4,5]. In recent researches in Iran, prevalence of Low Back Pain (LBP), average pain severity, referring to physician and absence from school among girl and boys have been 39% and 29%, 3.1 and 2.5, 9.5% and 17.5%, 14.3% and 10.6% respectively [6].

Behavioral risk factors and improper habits among school children are the major contributor to high rates of back pain [7]. Healthy spine-related behavior during daily activity and its cognitive determinants among children is a key outcome in the evaluation of back care education interventions' effectiveness [8]. Adoption of a

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healthy spine-related behavior is essential for the prevention of MusculoSkeletal Disorders (MSD); especially in back pain. Likewise, though back pain was not a common problem in this age group but knowledge about the causes of back pain in childhood might allow early prevention [9]. According to the Social Cognition Models (SCMS), the role of individual health cognitions (e.g., knowledge, outcome expectancies beliefs, self-efficacy), are important to determine health-related behaviors [10,11].

Despite numerous studies reporting the prevalence of back pain among school aging children, however, to the authors' best knowledge, no such research has been done to assess the back care behaviors and its cognitive determinants among pupils. The main purpose of this paper was to assess the back pain, healthy back behavior and its cognitive determinants among pupils and relationship between them.

Instruments and Methods

A descriptive cross-sectional study was conducted between october 2018 and March 2019. The study participants consisted of 610 (response rate= 75%) fifth-grade girls' population attending elementary school in capital Tehran`s region 22 context. The big region 22, located in the northwestern of capital Tehran, represents population with a variety of socio-economic characteristics and for this reason it was the best candidate for this study. This gender and age group were selected for two reasons: a) studies show that girls are most vulnerable compared to boys [6] and b) because it represents back pain ranks 9th in years lived with disability in 10- to 14-year-olds and rises to 4th in 15- to 19-year-olds [3]. In this descriptive research, the sampling technique was convenient. To collect the data, we used a self-reported questionnaire. Demographic characterize questions included: the parents' job and level of education, birth ranking, number of family member, transmit tool, and a question about the presence of back pain during last week (Yes, No).

To measure back behavior and its cognitive determinants, authors have used the instruments that had been implemented in previous studies and represented good test–retest stability [8,12,13]. Translation and culturally adaptation approaches were based on the recommendations by previous studies [14]. During this process, the item "Elevator use versus taking the stairs" in behavior section, were excluded because of inapplicability in class context. Cultural adaptation and psychometric testing were performed. The content and face validity of the questionnaires was confirmed by the panelists and participant respectively. Internal consistency was obtained using the Cronbach's alpha coefficient. The Cronbach's alpha coefficients was from 0.89 to 0.96 which approved the reliability.

The questionnaires consisted: back care knowledge, was a multiple-choice quiz with 10 questions, a total score of between zero to ten and used pass/fail scoring procedure; and assigned a category of high, medium, and low. Self-efficacy (SE) subscale was measured by 4 items that were rated on a four-point scale (from difficult to easy); a summary score for all items was calculated with a total possible value of 16. Again the authors assigned a range score portraying high, medium, and low SE. Fear-avoidance beliefs section was assessed through six questions were rated on a five-point scale, with a low score for strongly disagree to a high score for strongly agree. Back care behavior subscale was also evaluated through six items regarding daily activity as a summative score on a scale of never (1), almost never

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(2), sometimes (3), almost ever (4), and ever (5); total possible points for beliefs and behavior was 30; authors assigned the range scores as portraying high, medium, and low beliefs and behaviors.

Data was analyzed by using SPSS 24, the descriptive statistical procedure was conducted to present the demography characteristics of participants and self-reported back pain prevalence during the last week. Categorical back behavior and cognitive variables were analyzed using crosstabs and chi-square tests to broadly assess the data related to the presence of back pain and identify factors associated with back pain. The level of significance was obtained at $p < 0.05$.

Findings

In all, 610 5th-grade girls participated in the research. The results showed 50.3% of the participants (n= 307) were the only child in their family, 79.4% of their father (n= 487) and 82.1% of their mother (n= 501) had secondary and higher education, respectively; 23.6% of pupils (n=144) reported back pain during last week. Table.1 demonstrates the common information of the pupils with frequency and percentage. Means knowledge, SE, beliefs, and back behaviors of the subjects were 4.56±1.44, 11.74±3.05, 20.43±4.84, and 21.89±5.22 respectively. In addition, only 1.8%, 33%, 18.5%, and 31.6% of the participants had a high level of the back care knowledge, self-efficacy, beliefs, and back care behaviors respectively (Fig.1).

Table.2 shows the relationship between the presence of back pain during last week, the back behavior and its cognitive determinants. There was a significant relationship between the back pain with back behavior (P=0.004) and self-efficacy (p<0.001). There was no significant relationship noticed between the back pain and knowledge (P=0.171) an also back pain and d beliefs (P=0.250). Likewise, it was found no significant association between the back pain and demographic characteristics.

Discussion

This study was a modest contribution to the ongoing discussions on assessing the back pain, healthy back behaviors and its cognitive determinants among 5th–grade girls in an Iranian elementary schoolchildren context. Particular attention was paid to demonstrate the descriptive information and association between the back pain, knowledge, self-efficacy, beliefs, and the back behaviors in participants.

This study had a novel approach and was important. To our knowledge, the originality of our paper lies in the fact that it is the first research to investigate back pain, spine-related behavior during daily activity, cognitive factors, and obtaining the relationship between these variables among pupils. It This study provided the opportunity to assess back behaviors and its determinants, then we could develop an educational intervention in order to make behavior change and back pain prevention. Results of this study indicated that this sample of pupils demonstrated insufficient or inaccurate knowledge of the back care principals. For example, 73.1% of the participants did not correctly answer this question: “How pick up books from a pile on the floor and put them on a table?”. In addition, 67.9%, 71.6%, 75.1%, and 91.8% of the sample did not correctly understand these questions: “The hardest position for back”, “Number of spine curves”, “How book bag is loaded in the best way?”, and ‘How much should the maximum weight of book bag be?” respectively. Although, 95.1% and 93.1% of the participants answered these questions incorrectly: “The best way to carry their book bag” and “The best way to carry

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their groceries" respectively. These results are in good agreement with santos et al. and Dolphens et al. studies that reported low score of the theoretical knowledge [8,15].

Regarding the presence of back pain during last week, 23.6% of pupils (n=144) reported back pain that is almost comparable to reported prevalence rates in Dullien et al. study [16]; in addition, they mentioned that the leading three causes of back pain are physical overload situations. study revealed that only 42.5% of pupils reported proper position in physical overload situations.

Current study assessed the self-efficacy of pupils towards proper back care behaviour. The overall outcome has shown that only 34.6% (n=211) of all pupils perceived that they could attain a natural curvature of the spine. Additionally, 37.9% (n=231) of participants reported confidence to pay attention to ergonomical postures. Further, results revealed a significant relationship between SE and back pain; so that 38.2% of participants that reported no back pain had a high level of SE (Table.2). The results in this study are in relative agreement with previous study that reported a significant relationship between SE and physical activity level of participants [17]. Similarly, Bandura considers self-efficacy the most important personal factor in behavior change, and it is a nearly ubiquitous construct in health behavior theories [10]. According to Dolphens et al. study, modelling, feedback, and reattribution sufficiently are important factors to improve self-efficacy in health-related behaviour [8].

Likewise, in the back-behaviour assessment, descriptive data demonstrated that only 31.6% of participants had a high level of the back care behaviour (Fig.1). It is notable that level of back care behaviour influence back pain. According to results, it can be stated that 75.9% of participants that reported back pain had a medium level of proper back behavior (Table.2). This may be explained by the idea that pupils have to carry heavy backpack and adopt poor posture due to fixed sitting posture for long period. Supporting previous work, behavioral risk factors reinforce the risk of back pain [3,16,18].

In this study, there are limitations that must be noted. First, data were only collected from the 5th-grade girls' population attending public elementary school in capital Tehran`s region 22;so that independent elementary schools, grads, as well as male pupils did not enroll to study. Therefore, the generalizability of outcomes to the overall population may be limited. In addition, due to decrease recall bias, back pain report was limited within the last week. Study was limited to main cognitive determinants of behavior and the other determinants (environmental determinants of behavior), did not assessed. Despite these limitations that have been explained, understanding the connection among specific individual determinants and pupils' back pain may help health educators plan appropriate interventions to reduce and prevent back pain and guide appropriate strategies.

Conclusion

The purpose of this paper was to assess the back pain, healthy back behavior and its cognitive determinants among 5th–grade girls' elementary school context in Iran. The results showed that SE and back-care behavior were significantly related to back pain. Knowledge and beliefs among finding, though not statistically significant relationship in this sample, need further studies among larger and diverse pupils' populations attending in a variety community-based settings, including schools. Further, it is important that health educators are aware of the importance of individual determinants related not only to back pain prevention, but to other aspects of health promotion behavior, especially in pupils.

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Table 1. Basic characteristics of the studied pupils (n=610)

Fathers' job	Frequency	Percent
Employed	564	92.5
Unemployed	4	0.7
Retired	28	4.6
Mothers' job		
Employed	123	20.2
Housewife	480	78.7
fathers' level of education		
Illiterate/primary	29	4.8
Secondary	239	38.7
Higher	248	40.7
Mother's level of education		
Illiterate/primary	29	4.8
Secondary	285	46.7
Higher	216	35.4
Presence of back pain		
Yes	144	23.6
No	459	75.2
Birth ranking		
Only child	307	50.3
Second child	221	36.2
Ohers	67	11.3
Number of family member		
3 people	579	94.9
> 3 people	31	5.1
Transmit tool		
Walking	180	29.5
Public	18	3.0
Own car	219	35.9
Service	189	31.0

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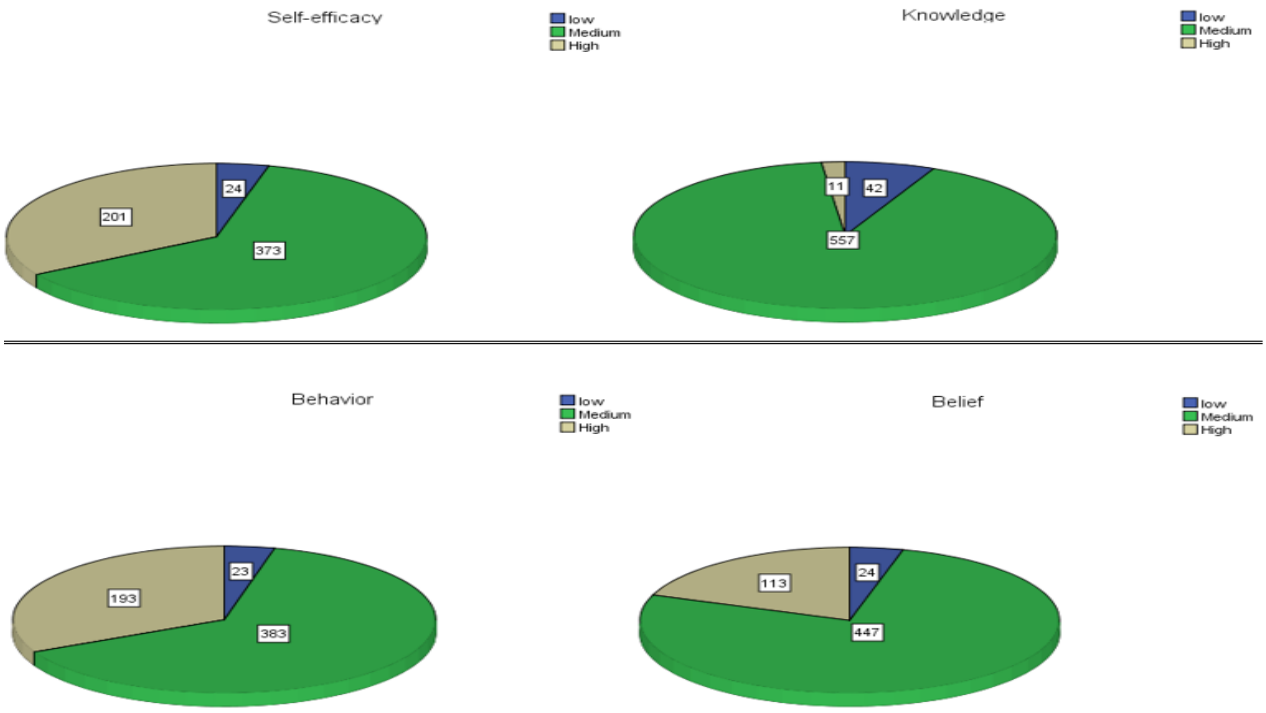

Figure 1: Pie Charts of back behaviors and cognitive variables levels (n=610).
(Low: Less than the first quartile, Medium: Between the first and third quartiles, and High: More than the third quartile)

Table 2. Presence of back pain by back behavior and cognitive variables (n=610)

Variables (Score)	**Range of levels ***	**Presence of back pain** N(%)		**P-value ****
		Yes	No	
Knowledge (0-10)				
Low	0 - 2	12 (8.3)	30 (6.5)	
Medium	3 - 7	127 (88.2)	424 (92.2)	0.17
High	8 - 10	5 (3.5)	6 (1.3)	
Self-efficacy (4-16)				
Low	4 - 6	8 (5.8)	15 (3.3)	
Medium	7 - 13	104 (74.8)	265 (58.5)	100.0>p
High	14 - 16	27 (19.4)	173 (38.2)	
Beliefs (6-30)				
Low	6 - 11	5 (3.6)	18 (4.1)	
Medium	12 - 24	112 (81.8)	331 (75.1)	0.25
High	25 - 30	20 (14.6)	92 (20.9)	
Behavior (6-30)				
Low	6 - 11	4 (2.8)	18 (4.0)	
Medium	12 - 24	107 (75.9)	274 (60.6)	0.004
High	25 - 30	30 (21.3)	160(35.4)	

* (Low: less than the first quartile, medium: between the first and third quartiles, and high: more than the third quartile)
** $\chi 2$ test for categorical variables. Statistically significant relationship ($P<0.05$) are marked as bold.

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This study represents an initial work to assess the understanding of Iranian 5th–grade girls' elementary school regarding the link between their back pain, the healthy back behavior, and its main determinants; and to advance the information needed to design and implement effective intervention to improve pupils' health and to prevent adulthood back pain at its roots.

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Ethical Permissions: The authors would like to extend their thanks to Ministry of Education and District Five authorities and staff in Tehran for implementing the project. This study was registered by the ethics committee of Tarbiat Modares University under the code IR.TMU.REC.1396.727 and was in accordance with the Helsinki Declaration. In order to comply with ethics, we invited all of the available students that had been approved for participation by their school principal, and their parents; informed them about research design, aim, objectives, as well as voluntariness, confidentiality and their rights. They then agreed to participate in the study followed by completing and returning the questionnaires.

Conflict of Interest: The authors declare that they have no competing interests.

Author contribution: ZAC: was the main investigator, collected and analyzed the data, and wrote the first draft. She took responsibility for conducting the study and the integrity of the data and the accuracy of the data collection.

SST: conducted whole study, supervised and contributed to all aspect the study.

SST, ZAC and AM: partnership in this study. All authors read and approved the final manuscript.

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