RESEARCH ARTICLE OPEN ACCESS

Effectiveness of Backpack Safety Program among School Going Children in a selected School at Karaikal District

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Abstract

The use of backpacks among school-going children has become a significant health concern in India. Heavy backpacks can lead to various musculoskeletal problems, including back pain, poor posture, and long-term spinal issues. Research on the efficacy of backpack safety initiatives is conspicuously lacking, despite the increased awareness of health risks associated with backpacks. This study utilized a one-group pretest-post-test design with 40 purposively selected participants. Data analysis, conducted through structured questionnaires, revealed a significant improvement in school going children's knowledge on the post-test, indicating the effectiveness of the backpack safety program (Mean: 25.29 vs. 3.12, $p < 0.001$). The findings highlight the effectiveness of Backpack Safety Programme by complying with the backpack wearing and posture maintenance thereby increasing the quality of life of the school going children.

Keywords: Backpack, Backpack Safety program, School going children

INTRODUCTION

School and education are crucial in a child's life. It is an organization that supports a child's whole growth in addition to teaching academic knowledge. For over a century, pupils all throughout the world have been traveling with the backpack. Each year, when school begins, kids everywhere are eager to get started. However, they are weighed down by bulky baggage. They bring lunches, a full water bottle, a bulky stationery box, and a variety of books for their break. Even items that might not be necessary for that day are packed.

Some people bring all of their books to school because they fear reprimands.Numerous children are unaware of the long-term effects of hefty baggage on their backs. Based on various research, carrying big baggage might impact a child physically and cognitively. Heavy bags might cause back discomfort, slouching back, head, neck and shoulder problems. Worst still, in the long run, bad posture will lead to scoliosis if this behavior is not stopped.

Adolescent musculoskeletal problems are a global health concern, and there is evidence that their prevalence is rising. Adolescence, one of the most sensitive developmental stages, can cause a range of health issues for people due to unhealthy lifestyle choices.

Adolescent students now frequently wear backpacks, even though numerous professionals from a variety of professions have pointed out that they are one of the main causes of musculoskeletal ailments.

Research indicates that the majority of students bear over 10% of their body weight, which is associated with several issues, including low back pain (LBP). When a backpack weighs more than the recommended amount (10% of body weight), back and upper-body pain occurs.

Hence it is essential to close the knowledge gap between healthy behavior and practice. This study set out to find out how school-based educational initiatives affected the way that school-age children carried their backpacks. It is envisaged that the study’s conclusions would offer a good way to reduce skeletal and muscular injuries in school going children.

MATERIAL AND METHODS

Study area

The study was conducted at a selected school in Karaikal. It has the capacity of around 250 students.The rationale for selecting the school for the research study is the availability of study samples and the administrative cooperation.

Study design

In this study, a pre-experimental one-group pretest-post-test design is selected. This research design involves measuring the same group of participants at two distinct points in time: before the intervention (pretest) and after the intervention (post-test). This design allows for the evaluation of the effectiveness of backpack safety program among school going children by comparing the pretest and post-test results within the same group. The choice of this design supports the investigation of cause-and-effect relationships and helps to understand the intervention's potential outcomes.

Data Collection technique

Section A: Demographic variables

It consists of age, gender, birth order, standard of studying,educational status of parent, type of family, place of living and source of information.

Section B: Knowledge questionnaires regarding backpack safety program

A structured knowledge questionnaire assessed the level of knowledge on backpack safety program among the school going children. There are 25 questions related to backpack safety. The right answer receives 1 point, the incorrect answer receives 0 points, and the maximum score is 25.

Scoring and interpretation

Description	Scores	Percentage
Adequate knowledge	23-25	92-100%
Moderately adequate knowledge	15-22	60-88%
Inadequate knowledge	0-14	0-56%

Feasibility Study

"Reliability is the consistency with which an instrument measures the target attribute" **(Polit and Beck 2008)** The reliability of the instrument was established by Cronbach's alpha method. The reliability value was found to be 'r'=0.8, which indicates that the instrument was reliable and considered for proceeding with the main study.

Statistical Sample Size and Sampling Technique

The sample size selected in this study is 40. The sampling technique used in this study is the purposive sampling technique

Quantitative analysis

Statistical analysis helps the researcher to make sense of quantitative information. Statistical procedure enables researcher to summarize, organize, evaluate, interpret, and communicate numeric information. The collected data were planned to be organized, tabulated, and analyzed by descriptive and inferential statistics. Data was analyzed by using descriptive and inferential statistics. Standard deviation and 't' test will be used to find the effectiveness. Inferential statistics like paired 't' test and Chi-square test were used. The SPSS version V.30 statistical package was used for data analysis.

RESULTS AND DISCUSSION

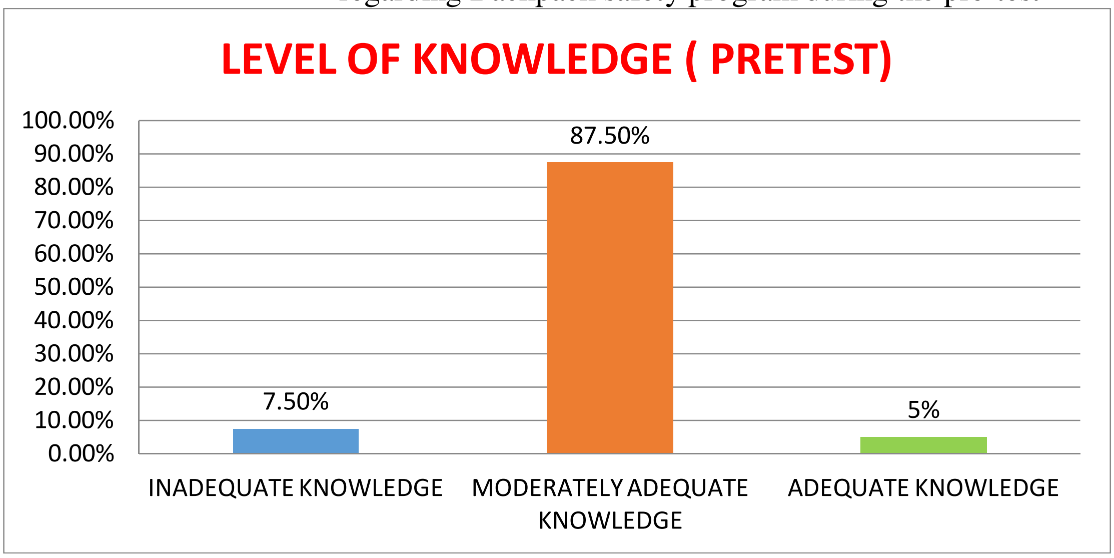
Table No.1: Frequency and percentage-wise distribution of school-going children on level of knowledge scores regarding backpack safety program.

n=40

Knowledge questionnaires on Backpack safety program	Pretest	
	Frequency	**Percentage**
Inadequate knowledge	3	7.5
Moderately adequate knowledge	35	87.5
Adequate knowledge	2	5
Total	40	100

Table 1 shows the frequency and percentage-wise distribution of level of knowledge regarding backpack safety program among school-going children during the pretest. The pretest knowledge scores of school-going children with inadequate knowledge was 3 (7.5%), school going children had moderately adequate knowledge was 35 (87.5%), and the remaining 2(5%) school going children had adequate knowledge.

Fig.1: Frequency and percentage-wise distribution of school-going children on level of knowledge scores regarding Backpack safety program during the pre-test



In a similar randomized cross sectional study conducted among parents by Zeinab Javadivala et al (2012) on an awareness of parents about characteristics of Healthy school backpack, it was found that approximately 144 (56.3%) of the parents were unaware that the backpack's size needed to be proportionate to the upper back area, and 132 (51.6%) were unaware of the suggested weight limit for carrying school backpacks. The mean score of fathers' and mothers' understanding of a standard and safe school backpack showed a significant difference: men knew more about school backpack carriers.

Table No.2: Frequency and percentage-wise distribution of children on level of knowledge scores regarding backpack safety program during post-test.

Knowledge questionnaires on Backpack safety program	Post-test	
	Frequency	**Percentage**
Inadequate knowledge	0	0
Moderately adequate knowledge	4	10
Adequate knowledge	36	90
Total	40	100

n=40

Table 2 shows the frequency and percentage-wise distribution of knowledge regarding backpack safety program among school-going children during the post-test. The post-test knowledge scores for backpack safety program of school-going children with were 4(10%) parents had moderately adequate knowledge,0(0%) parents had inadequate knowledge, and the remaining 36(90%) parents had adequate knowledge.

Fig.2: Frequency and percentage-wise distribution of school-going children on level of knowledge scores regarding backpack safety program during the post-test.

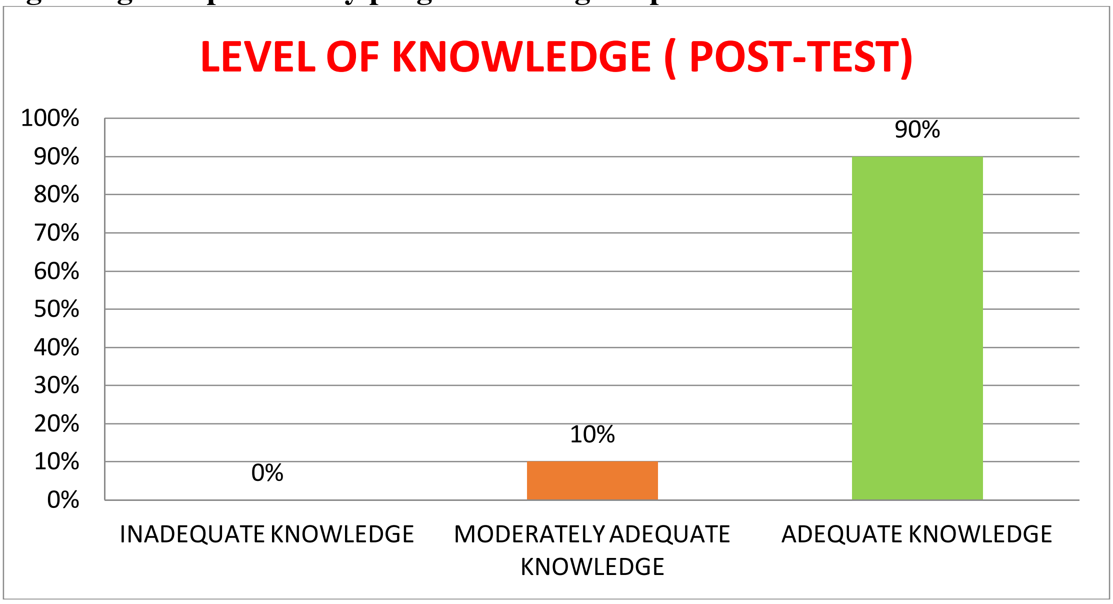


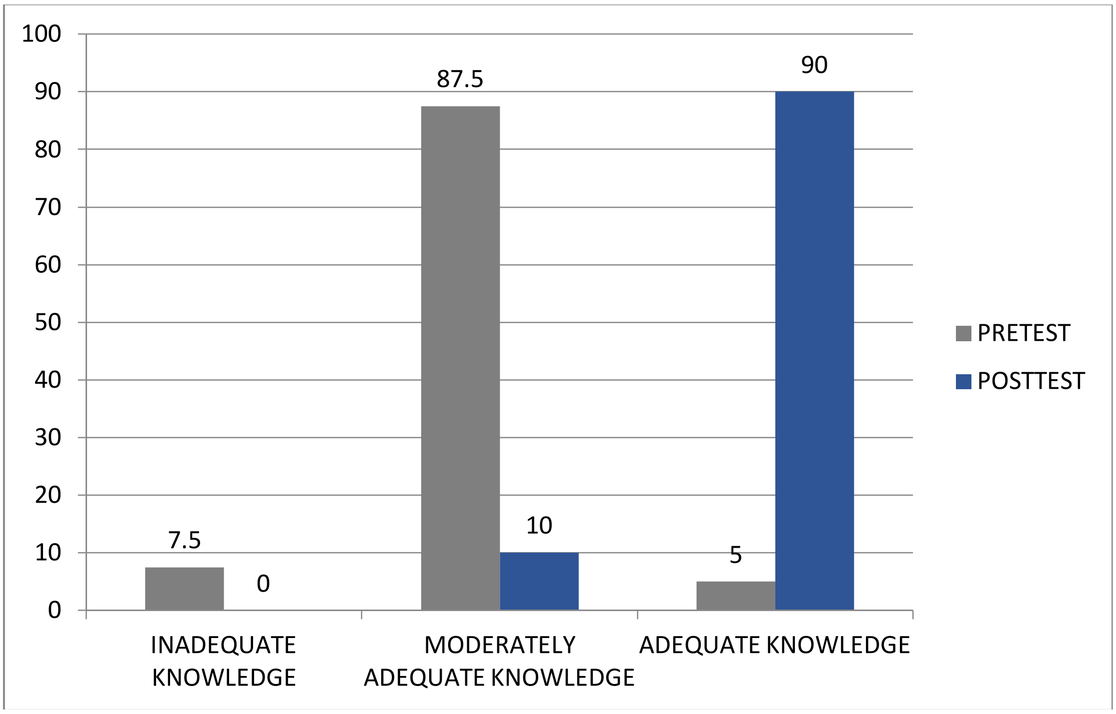
Table No.3: Comparison of pre and post-test knowledge scores regarding backpack safety program among school-going children.

n=40

Knowledge questionnaires on Backpack safety program	Pretest		Post-test	
	F	**%**	**F**	**%**
Inadequate knowledge	3	7.5	0	0
Moderately adequate knowledge	35	87.5	4	10
Adequate knowledge	2	5	36	90
Total	40	100	40	100

Table 3 shows pre-test and post-test knowledge scores regarding backpack safety program among school-going children. The children had inadequate knowledge in pretest 3(7.5%) and post-test 0(0%), children had moderately adequate knowledge in pretest 35(87.5%) and post-test 4(10%), children had adequate knowledge in pretest 2(5%) and post-test were in 36(90%). The above table indicates a significant difference between pre and post-test knowledge scores.

Fig.3: Comparison of pre and post-test knowledge scores regarding backpack safety program among school-going children.



Effectiveness of need-based health education programme on level of knowledge on backpack safety program among school going-children during pretest and post-test scores

Table No.4: Comparison of pretest and post-test level of knowledge mean and standard deviation scores among schoolgoing-children

n=50

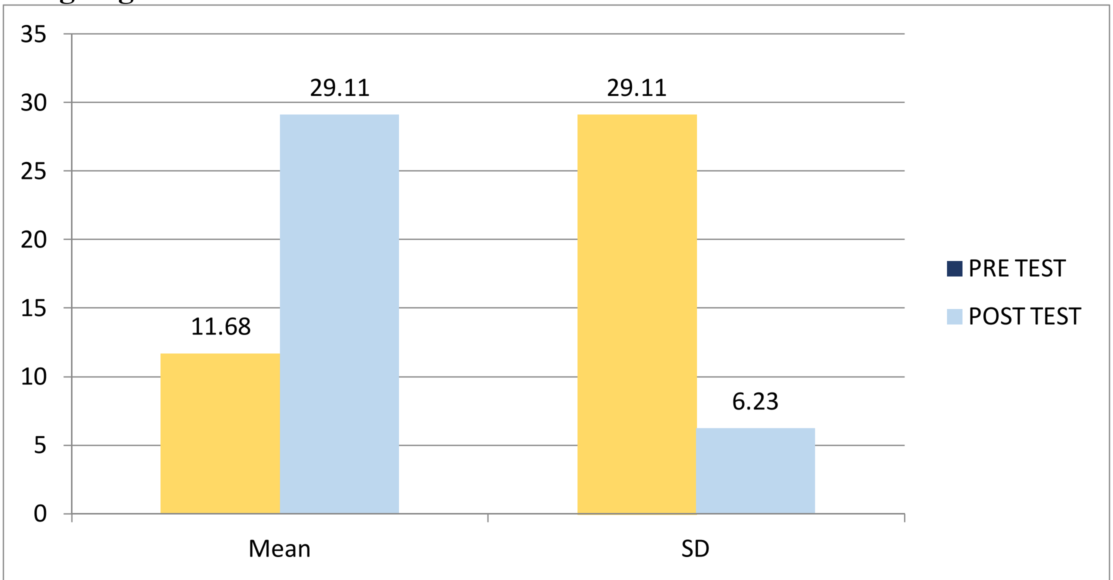
Effectiveness of pretest and post-test	**Test**	**MEAN**	**SD**	**df**	Paired t	P
Knowledge regarding backpack safety program	Pretest	11.68	**8.62**	**99**	22.038	0.00
	Post-test	29.11	**6.23**			

(HS) Highly significant 5% at p<0.001**

Table 4 revealed the effectiveness of need-based health education program on backpack safety program among school going-children. They compared pretest and post-test scores of the level of knowledge regarding backpack safety program among school going-children by using a paired 't' test and finding the t value as 22.038.The mean and standard deviation values of the pretest were 11.68 and 8.62 and the post-test were 29.11 and 6.23.

In a parallel study conducted by **Nazila Nejhaddadgar et al (2022),** on the effects of school based educational program on Backpack carrying behaviour among teenage students using group randomized control trial the result revealed that the intervention strategies significantly improved the research group's safe backpack usage behavior score ($P = .0001$). This means that the proposed program was effective in reducing the load, taking into account, and potentially preventing the occurrence of low back pain among adolescent students.

Fig.4: Comparison of pretest and post-test level of knowledge mean and standard deviation scores among school going children.



ASSOCIATION BETWEEN THE PRE-TEST LEVEL OF KNOWLEDGE SCORE WITH THE SELECTED DEMOGRAPHIC VARIABLES

The association of the pretest level of knowledge on Backpack safety program with the selected demographic variables among school going-children was done. The calculated 'p' value is statistically significant with the age, gender, birth order, standard of studying, educational status of parent, type of family, place of living and source of information of school going-children at $p<0.05$. The calculated 'p' value shows a significant association between the child age, birth order of the child, class of studying and educational status of parent among school going children with $p <0.05$.

A similar cross sectional study was conducted by **Abdulmonem Alsiddiky et al (2019),** in the topic "Assessment of perceptions, knowledge and attitudes of parents regarding children's schoolbags and related musculoskeletal health" 616 parents in all, 284 (46.1%) of whom were fathers and 332 (53.89%) of whom were moms, agreed to take part and finished the survey (100% response rate).The majority of participants (84.1%) were married, with the remaining participants being widowed (0.8%) or divorced (14.2%). In all, 63.1% of people were employed, compared to 9.1% who were students and 18.9% who were jobless. A little percentage of the parents lived in countryside, while the majority were city dwellers. The majority of participants earned between 5,000 and 20,000 SAR each month.

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Conclusion

The study concluded that though there is a time constraints and the need for the curriculum to include a wide range of other disciplines, it is imperative that backpack safety programs be implemented in schools. Researchers should investigate ways to reduce pain in young individuals, particularly those who carry a backpack, and future school going children and adolescent students should be taught safe backpack carrying techniques.

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