

Effectiveness of pack it light back it right, back-safety intervention among school going children, Bengaluru.

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Abstract

Background: The backpack is one of the several forms of manual load carriage that provides flexibility and is often used by the school children. Across the nation, millions of school students are racing out to their classes or carrying overstuffed backpack. This backpack can seriously attribute to the regional pains in the children especially in the upper back, shoulder and neck.

Objectives: To determine the effectiveness of “pack it light, back it right- back safety intervention” on knowledge and practice regarding back safety among school going children. To find the relationship between knowledge and practice regarding back safety among school going children

Materials and methods: A quasi experimental one group pre-test post-test design was used to assess the effectiveness of pack it light back it right back safety intervention among school going children. Simple random sampling technique was used to select 110 students studying in two different school. Data was collected using structured questionnaire and checklist to assess the knowledge and practice regarding back safety among school going children.

Result: The study result revealed that 45.45% were 12years of age, more than half of the subject were male comprising of 55.5%, majority 70.9% of the school going children were underweight, nearly 84.5% of student were carrying bag weight of 4-7kg, 99.9% of them carrying bag weight more than 10% of their body weight, 88.2% of the school going children carried

backpack on both the shoulders, 99.9% of the school going children experienced pain while carrying their backpack. 70.77% of students were having lower back pain, and 81.8% has complaint of shoulder pain. On assessing the effectiveness of knowledge, the study revealed that the back safety intervention was effective.

Conclusion: On the basis of study findings, appropriate and effective actions need to be taken by the government as well as school authorities in reducing school bag weight because majority of school going children carries bag more than 10% of their body weight, which contributes to the regional pains like upper back, shoulder and neck

Keywords: : Effectiveness, Pack it light, back it right-back safety intervention, School children, knowledge and Practice.

Introduction

Imagine this - you are going to school, and you hear that the government has banned homework. Wouldn't that be the best day ever? Well, it is actually in India. The government declared that there would be no homework for students in grades one and two. The reason: heavy school bags.

A few years ago, the municipal corporation had looked at the idea of having locker rooms where students could leave their books after class without having to cart them from home and back. The idea was never implemented. The Thane municipal corporation, which runs schools with over 35,000 students, has announced that bags carried by the children will be lighter when classes start in June for the new academic year. Students will no longer have to carry to school daily, books meant for the entire year. This is not the first experiment in Thane to reduce the weight of school bags.

Across the nation, millions of elementary high school and college students are racing out to the school bus or

carrying to their classes with overstuffed backpack hang over their shoulders. The school bag packed is stuffed with textbook, notebooks, library books, geometrical and mathematics instruments, snacks box lunch packs water bottle and project related materials.⁽¹⁾

In children and adolescent, the environment particularly in schools contributes to the development of musculoskeletal disorders. At this time, the bone structure is developing and disorders that cause orthopedics and rheumatologic diseases⁽²⁾. The cause of musculoskeletal disorders in children and adolescent is multifactorial, because of involved participation in sports or exercise, long periods of inactivity, poor posture while sitting or standing and wearing backpacks that are overweight⁽²⁾. Because at this age, the bone structure and formation is developed. Therefore, use of backpack increased the substantially for carrying necessary equipment's.

In today's life there is a growing concern among the teachers, medical professionals and parents over the increasing incidents of backpack related injury in school children. While carrying the backpack children unknowingly place a strain on their body especially when they used it in one shoulder⁽³⁾. A study conducted in India, found that the mean bag weight carried by urban school children is 7.1 kg which is 17% of their body weight and for rural school children is 3.2 kg⁽³⁾. In UK the average backpack weight is 15-20% of their body weight, and some children carry backpack as heavy as 30% to 40% of their bodyweight⁽¹⁾.

This backpack can seriously attribute to the regional pains in the children especially in the upper back, shoulder and neck. The severity of the said problems in children can increase to such an extent that it might even interferes with the activities of daily living and

their parents have to take them off to hospital and spent for treatment⁽³⁾.

The daily physical stresses associated with carrying backpacks cause significant forward lean of the head and trunk. It is assumed that daily discontinuous postural adaptations would result in pain and disability of school going children. Most of these suffering brought it during young years because of early use of carrying overweight backpack to school, not just in two shoulders but also carrying in one shoulder has greatly increased the risk of pain and injury. This improper use of backpacks can lead to muscle imbalance which in turn lead to chronic back pain and neck problem in later life⁽¹⁾.

Research has explored whether there is critical backpack weight to body ratio exceeded its effects on health's studies, indicate the incidents of backpacks use by school children in the developed countries is at least 90%. The average loads of backpack vary greatly between studies but the majority of reports indicate that the bag loads carried by students in school is greater than the recommended limits⁽⁴⁾.

Materials & Method

Study Design: The research design selected for the present study was quasi experimental one group pre-test post-test research design.

Variables

- **Independent variables:** Pack it light, back it right-back safety intervention.
- **Dependent variables:** Knowledge and practice regarding back safety.
- **Attribute variables:** It include socio demographic variables such as age, gender, class which participant is studying, syllabus, type of transport used, practice of leaving book in school, locker facilities, distance of carrying school bag

Setting of the study: The setting of the study was English School, Bengaluru. The selection of the school was based on geographical proximity, feasibility of conducting the research study, availability of the samples and familiarity of the investigator with the setting.

Sample size: 110 school going children.

Sampling technique: Simple random sampling technique (lottery method) was used to select the samples.

Inclusion criteria

- School going children who:
 1. Are willing to participate in the study.
 2. Respond to English fluently
 3. Can read and write in English.

Exclusion criteria

- School going children who are not available at the time of data collection
- School going children who are unable to carry school bag by themselves

Development of tool: Various literature were reviewed; including previous researcher, journal, newspaper articles etc. opinion were taken from expert and research guide to develop the tool. After the construction of the tool, the tool was validated and then put forth for the data collection. The tool consists of 3 sections.

The tool consisted of:

Socio demographic characteristic: It include Age, Gender, Class, Weight of the student in kg, Height of the student in cm, BMI, Weight of the school bag, Height of the school bag, Method of carrying school bag, How do you come to school, Location of classroom in school premises, Experience of pain, Common item place inside the school backpack

A calibrated KRUPS manual body weighing machine was used to check the body weight of the school going children. Machine was certified by SSR solution on February 2020 with capacity/ accuracy of 125kg/500gm. The machine was calibrated on 29th February 2020. The weight used was standard weight.

Another calibrated weighing machine (WEIGHMEC) was used to check the weight of the school backpack for the school going children. Machine was certified by SSR solution on February 2020 with capacity/ accuracy of 10kg/1gm. The machine was calibrated on 29th February 2020. The weight used was standard weight.

Section A: Structured questionnaire to assess knowledge regarding back safety.

Structured knowledge questionnaire was developed by extensive review of literature, discussion with experts. Subject experts validated the tools. The two session of the study were delivered to the school going children i.e pre-test and post-test who met inclusion criteria for the research study. Each session lasted for 30 minutes.

The tool consisted of 10 items on various aspect of school back pack, items to be placed inside the school backpack, distribution of books to maintain the weight of the school backpack, correct posture of carrying school backpack.

Each multiple choice item had 4 options out of which only 1 option was the correct answer and the remaining 3 are wrong answer.

Section B: Structured practice checklist to assess the school going children practice regarding school backpack.

Structured practice checklist was developed by extensive review of literature, and discussion with the expert. The tool was validated by subject expert 2 session was developed to assess the practice of carrying

school backpack among school going children who met the inclusion criteria for the research study.

It consisted of 11 items where the student researcher observed the school going children regarding the type of backpack used, whether it is a padded shoulder strip, present of compartment in the school backpack, how they organised their book in their backpack, availability of locker in the school, other accessories items placed inside the backpack, posture of walking while carrying backpack and style of carrying school backpack both shoulder or one shoulder. Each question consist of Yes or No option

Validity: Content validity of the tool was sent to 12 experts and received corrections regarding placement of option and suggestion were made to consult with occupational therapy.10 experts comprising of 6 Nursing experts, 1 Assistant Professor and 1 Lecturer from Ramaiah medical college Community Medicine Department, 1 statistician, 1 paediatrician doctor from CIHSR and 1 occupational therapy CMC Vellore. The tool was modified as per the suggestion made by the experts.

Reliability: The tool was tested for reliability using test re-test method ($r= 0.82$ and 0.78) respectively.

Ethical clearance: The ethical clearance for this study was obtained from the ethics committee of Ramaiah Institute of Nursing Education and Research.

Pilot study: Pilot study was conducted at St. Lourdes English School, Bengaluru

Data collection procedure: Data collection was conducted during the month of March 11th March to 16th march at Cambridge school and AKAI Public school.

After obtaining a formal permission from the concerned authority. Student researcher introduced her selves to the school going children. The selected school going

children fulfilling the selection criteria were given a written consent to the parents through their teacher and assent was taken from the school going children whose parents have approved to let their child participate in the study. The purpose of the study was explained to the school going children.

Data collection was carried out on unscheduled day in order to obtain the actual weight of the school bag. On the day 1 school going children were asked to bring the school bag provided by the school authority. Each school going children school backpack weight was measured with calibrated digital metis iron weighing machine. A portable stadiometer was used to measure the height of each school going children in standing position.

The body weight of school going children was measured with calibrated adult weighing scale. On the same day, the school going children were asked to assemble in the given class room which was arranged by the school Headmistress.

The school going children were asked to complete their socio demographic profile and their knowledge were assessed by administering self-structured knowledge questionnaire of school children regarding backpack. Each school going children took around 30 minutes approximately to complete the questionnaire.

Simultaneously the student researcher observed the item placed in the school backpack and in the evening after the classes the student were monitored how they had carried their school backpack

On the next day the school going children were asked to assemble in the classroom for the back Safety intervention. The student researcher gave the intervention for about 30 minutes. Class was taken using power point presentation. A short video was shown to the student regarding the use of bag and

demonstration on how to pack it light, back it right and carrying it right. Post-test was conducted after 5 days.

The pre-test and post-test findings were recorded for analysis.

Statistical method: The data analysis was done using descriptive and inferential statistics. SPSS (version 20) was used to analyse the data.

1. Frequency and percentage distribution were used to describe the socio demographic variables
2. Mean and standard deviation were used to describe the socio demographic profiles
3. Karl Pearson correlation coefficient was used to find the relationship between knowledge and practice regarding backpack safety and demographic variables.
4. Paired 't' test used to find the effectiveness of pack it light, back it right back safety intervention

Results

The collected data were analysed according to the objectives of study. The findings are presented below.

I: Socio demographic characteristics of the subjects.

Frequency and percentage distribution were computed for sociodemographic characteristics of the subjects. It is observed that majority of the school going children were in the age group of 12 years comprising 45.5% while the students of age group 10 were the least comprising only 12.73 % of the total number of school going children. The percentage distribution of gender shows that 55.5% were male and 44.5% were female and 35.5% were studying in 6th grade and more than half of the school going children (54.5%) was of 30-39 kg weight, whereas only class whereas only (0.9%) student was of 70-79 kg body weight. The analysis of height indicates (44.5 %) school going children are in 139-146 cm and majority of the school going children were underweight (70.9%) were underweight having

below $< 18.5 \text{ kg/m}^2$ BMI and 26.4% of the school going children was having normal BMI. It is observed that (84.5%) school going children carry bags weighing 4-7 kg, it is also noted that (99.09%) carry bags more than 10% of their body weight. The percentage distribution of height of school bag shows that 78 numbers of school going children (70.9%) carry bag measuring 46-48cm. Majority of the school going children 97 (88.2%) carries school bag in both shoulder while 3 school going children (2.7%) carry in their hand. Less than half 52 (47.3 %) come to school by walking while 51 (46.4%) come to school by 2-wheeler /4-wheeler and (6.4%) come by cycle. (90%) school going children come to school from a distance of 500-1500m, most of the school going children (66.4%) travel a distance of 100-200m to reach classroom from gate, while (33.6%) travel a distance of 200-300m. with regards to classroom location (58.2%) had their classroom located in the 2nd floor and (38.2%) had their classroom located in the other floor, majority of the student 100 (90.9%) were experiencing pain symptom. 77(70%) were having lower back pain and 90(81.8%) were having shoulder pain.

II. Frequency and percentage distribution of the level of knowledge before and after administration “pack it light, back it right back safety intervention among school going children.

Majority of the students (64.6%) have moderate knowledge in the pre-test whereas (87.3%) have adequate knowledge in post-test. In regards to practice, majority of the school going children(81.8%) has fair practice in pre-test whereas majority (86.4%) has good practice in post-test.

III. Effectiveness of pack it light back it right back safety intervention among school going children in knowledge and practice.

There is significant difference in the level of knowledge before and after intervention with t test -27.247 with P value 0.000. Hence the hypotheses is accepted. There is significant difference in the level of practice before and after intervention with t test -23.743 with P value 0.000. Hence the hypotheses are accepted.

IV. Correlation between knowledge and practice regarding back safety intervention among school going children.

It was observed that there was there is negligible correlation ($r=-0.165$, $p= 0.084$) between knowledge and practice regarding back safety intervention among school going children

Discussion

This chapter discusses the major findings of the study with reference to the objectives and hypothesis stated and reviews them in relation to findings from the results of other studies. Findings of the study have been discussed in terms of objectives, theoretical bases and hypothesis. In this section, major findings of the current study have been discussed concerning the results obtained by the researcher.

Children studying in different education level use back pack for carrying their books and other educational materials. In the present competitive world educational system promotes the children to carry heavy back pack which will expose the children for health problem related to physical discomfort. In present study 90.9% (100) of school going children were having physical discomfort. 99.09% (109) of school going children were carrying backpack more than 10% of their body weight. These findings are consistent with finding of Avantika Rai 2016, which reported 91% of the school going children were carrying school back pack more than 10% of their body weight. Another study conducted by Al Hazza in 2005 reported that 54% of

school going children carry back weight more than 10% of their body weight and 86% of the children were having physical discomfort. The present study shows that the school going children has moderately adequate knowledge 64.6% before performing structured teaching program whereas after the teaching program there were drastic change in knowledge 87.3% has adequate knowledge. This study finding is also supported by another cross sectional study conducted in USA among 871 school children studying in three different schools the result revealed that 58.7% of the student had poor knowledge regarding carrying of school backpack and how to carry school backpack another similar result was also found in the study conducted in Saudi Arabia revealed that 64% of the student had moderately adequate knowledge before demonstration and after teaching program of school back pack there was sharp increase of the student 80% had average knowledge that showed there is significant increase after the study.

The current study revealed that the study was effective because there was increase in the post test score of the school going children both in practice and knowledge after the teaching program when compared to the pre-test. The study shows that there is a change in knowledge and practice of the school going children 87.3% of them were having adequate knowledge and 86.4% of school them were practicing well. T test was done to see the effectiveness of pack it light back it light for back safety intervention. The study revealed that the study was effective.

There have been many studies discussed regarding back safety for school going children our study finding revealed that there is a negligible relationship between knowledge and practice among the school going children with 'r' value -.165 and P value .084. In

support to my findings a study was conducted in Dharwad where the study finding revealed that there is no significant relationship between knowledge regarding back safety and school back pack

Another study was conducted in Uttar Pradesh where the study revealed that there is no significant relationship between knowledge and practice.

Limitations

- Authenticity of the information regarding socio-demographic variables is based on the response of the subjects.
- The findings of the study may not be generalized because of small sample and two settings
- Due to covid 19 the post test was conducted after 5 days

Conclusion

The present study findings indicated that the school going children 90.9% experienced pain while carrying school backpack, 99.09% were carrying backpack more than 10% of their body weight, 64.6% of school children were having moderately adequate pre-test knowledge whereas in post-test 96% were having adequate knowledge. It clearly signifies that there is no relationship between knowledge and practice regarding back safety among school going children. There is significant increase in knowledge and practice after lecture cum discussion session. Periodical assessment and teaching is required for the school going children.

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