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Review Article

Effectiveness of instructional teaching package on knowledge regarding first aid and safety measures among school children

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ABSTRACT

Introduction: Henry Sigerist, the medical historian, stated that “the people’s health ought to be the concern of the people themselves. They must struggle for it and plan for it. The war against disease and for health cannot be fought by physicians alone. It is the people’s war in which the entire population must be mobilized permanently.

Materials and Methods: This school-based interventional study was conducted in Radharani Siksha Mandir High School located in Paltagarh, Singur Block of Hooghly district, West Bengal, among students of Class VI and Class VII on February–March. The middle school students were chosen keeping in view of their mid-adolescent age that makes them prone to injuries and accidents. All students of 6th standard and 7th standard were eligible to participate. Although educational intervention was imparted to all those present on the day of intervention, post intervention knowledge was assessed among only those students whose pre interventional knowledge score was available.

Result: Out of 230 students, 60% of the students belonged to Class VII and the rest in Class VI and half of them who participated in the study were girls (53.5%). The mean age of the study participants was 12.5 ± 0.73 years. Background data revealed that majority of their parents were educated up to tenth standard (48.7% fathers and 37.8% of mothers); father of 25.2% were farmers, 24.7% were daily laborers, 18.6% were doing business, 26.5% of them were skilled laborers, and 5.0% of them were in service while mothers of all students were homemakers. All of the students had heard of the term “first aid” and out of them, only 14 of them (6 girls and 8 boys) had reported any past practical experience of administering first aid. Among those who had heard about first aid, TV/radio was the major source of information (38.7%), followed by parents (24.3%), teachers (17.4%), friends (11.7%), and relatives (4.8%). 36.5% of the students answered that there was a chapter on first aid in their science book while the rest either denied (54.3%) or could not even remember (9.2%) any such chapter. However, all of them unanimously agreed that it was not taught as a part of their syllabus.

Conclusion: The present study revealed that all the students had heard of the name of first aid which were similar to the findings of Priyangika and Hettiarachhi in a study conducted in Sri Lanka while Dasgupta et al. reported in her study that merely (15.2%) of the study subjects knew about the correct definition of the term first aid.”

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1. Introduction

” Often, delay in accessing appropriate medical care and/or lack of knowledge regarding treatment results in death of the injured which can be avoided by immediate resuscitation measures. First aid, as the name implies, is the first care

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given to a victim of an accident, injury, or sudden illness, before the provision of advanced medical care. First aid should be aimed to preserve life, promote recovery, and prevent worsening of the victim's condition. First aider should be able to assess the victim, provide the basic care, and then direct the patient to an appropriate medical care as soon as possible.¹⁻⁵ First-aid training is an important community survival skill necessary for all individuals as injuries and accidents have become the major epidemic of no communicable disease in India. Safety education must begin with school children since they not only represent the bulk of at-risk population with injury proneness, they also have the aptitude to learn with an innate enthusiasm to preach and practice among their family members, peers, and community. Schools are the most suitable places where proper education on the first aid can be delivered effectively due to the inherent ambience of the institution which makes them more receptive to any type of educational training. However, school health programs in India give limited emphasis on first-aid training in the educational curriculum which is in contrast to the scenario of developed countries like the United Kingdom where first aid is a more frequently taught subject in the health curriculum of schools. With this background, the present study was undertaken in a rural school of West Bengal where modular teaching was imparted to adolescent school children studying in Class VI and Class VII regarding selected first aid measures of common injuries/illnesses after preliminary assessment of their existing knowledge. Further, evaluation of their acquired knowledge and attitude was done to determine the effectiveness of the intervention.⁶⁻⁹

2. Objective

1. To assess the pre test knowledge score regarding first aid and safety measures among school children.
2. To assess the post test knowledge score regarding first aid and safety measures among school children
3. To evaluate the effectiveness of teaching programme on first aid and safety measures among school children.
4. To associate between the level of knowledge on first aid and safety measures among school children with selected demographic variables.

2.1. Hypothesis

1. RH_1 – There will be significant difference between pre-test and post-test knowledge score regarding first aid and safety measures among school children at the level of $P \leq 0.05$
2. RH_2 — There will be a significant association of pre-test knowledge score regarding first aid and safety measures among school children with selected socio-demographical variables at the level of $P \leq 0.05$.

3. Materials and Methods

This school-based interventional study was conducted in Radharani Siksha Mandir High School located in Paltagarh, Singur Block of Hooghly district, West Bengal, among students of Class VI and Class VII on February–March.¹⁰⁻¹² The middle school students were chosen keeping in view of their mid-adolescent age that makes them prone to injuries and accidents. All students of 6th standard and 7th standard were eligible to participate. Although educational intervention was imparted to all those present on the day of intervention, post intervention knowledge was assessed among only those students whose pre interventional knowledge score was available. Hence, out of total student strength of 260, analyses of questionnaires of 245 students was considered, i.e., the students who were present on the days of pre intervention assessment, modular teaching, and post intervention assessment which was done after 2 weeks. After obtaining permission from the Institutional Ethics Committee of All India Institute of Hygiene and Public Health, formal approval was obtained from the Headmaster and class teachers of the two classes and data collection of baseline knowledge of the students was done using a self-administered structured questionnaire, prepared in English, and then translated into the local language (Bengali) keeping semantic equivalence. The face and content validity of the questionnaire was checked by experts in the Department of Community Medicine at the All India Institute of Hygiene and Public Health, Kolkata, West Bengal. The questionnaire contained two sections: section (I) contained student's identification in the form of class and roll number along with socio demographic particulars and Section (II) comprised 14 multiple choice questions on two domains, namely, nine questions on knowledge of first-aid management of common injuries and five questions on attitude regarding first-aid application.

3.1. Pretest evaluation

Self-introduction about the investigator and information regarding nature of the study was explained. Informed consent was sought from each student, and the pretest self-administered questionnaire comprising both Section I and II was given to them after instructing all participants regarding the importance of providing accurate information.

3.2. Module for intervention

Analysis of their existing knowledge obtained from the pretest questionnaire was done and was utilized for preparing the teaching module. It consisted of systematically organized information on selected first-aid measures such as management skills of minor cuts, sprain, burns, fracture, foreign body in the eye, nose bleeding, insect bite, snake bite, and dog bite with relevant pictures and diagrams. Demonstration of usage of items which are

usually kept in the first-aid box such as elastic bandage, tweezers, and essential drugs was done at the end of the session.^{12–16}

3.3. Method of intervention

The intervention was given by lecture, PowerPoint presentation and demonstration for 30 min, including 20 min of modular teaching by PowerPoint presentation and 10min of demonstration of first-aid box contents. The module was handed over to the participants individually with the aim to reinforce their knowledge in future.

3.4. Posttest evaluation

Evaluation of the educational intervention program was assessed by conducting posttest using self-administered questionnaire comprising only Section II after 15 days. Data analysis was done using SPSS version 20 (Statistical Package for the Social Sciences Inc, Chicago, IL, USA). Excluding the incomplete questionnaire, the total questionnaire used for analysis was 230. Coding was done to assess the pre- and post-test knowledge by assigning for every correct response a value of “1” and for every wrong response a value of “0.” Maximum attainable score was “14” while minimum attainable score was “0.” McNemar Chi-square test was done to determine significant change, if any, between pretest and post test knowledge response on each subtopic as well as change in attitude toward the application of first aid. The overall mean pretest and post test scores of knowledge and attitude were compared using paired t-test to detect any significant change, and effect size calculation was done to assess the effectiveness of the intervention in terms of estimating the magnitude of the effect of interest.^{17–21}

4. Results

Out of 230 students, 60% of the students belonged to Class VII and the rest in Class VI and half of them who participated in the study were girls (53.5%). The mean age of the study participants was 12.5 ± 0.73 years. Background data revealed that majority of their parents were educated up to tenth standard (48.7% fathers and 37.8% of mothers); father of 25.2% were farmers, 24.7% were daily laborers, 18.6% were doing business, 26.5% of them were skilled laborers, and 5.0% of them were in service while mothers of all students were homemakers. All of the students had heard of the term “first aid” and out of them, only 14 of them (6 girls and 8 boys) had reported any past practical experience of administering first aid. Among those who had heard about first aid, TV/radio was the major source of information (38.7%), followed by parents (24.3%), teachers (17.4%), friends (11.7%), and relatives (4.8%). 36.5% of the students answered that there was a chapter on first aid in their science book while the rest either denied (54.3%) or could not even remember (9.2%) any such chapter. However, all of them

unanimously agreed that it was not taught as a part of their syllabus.

Overall, pre intervention knowledge on first-aid management was poor with maximum incorrect response for snake bite management, i.e., 218 (96.4%) and minimum incorrect for insect bite management, i.e., 112 (48.7%). After educational intervention, maximum correct response was noted in case of management of burns, i.e., 200 (87%) while minimum correct response was noted for snake bite management, i.e., 55 (67.4%) [Table 1]. There was significant difference between pre- and post- intervention knowledge attainment as revealed by McNemar’s Chi-square test on first- aid management of cut injury, (3.5%–86.5%) burns (3.5%–87%), sprain (9.2%–79.1%), fracture (12.6%–76.9%), dog bite (16.5%– 76.1%), snake bite (2.2%–67.4%), nose bleeding (24.3%–60.9%), and foreign body in the eye (28.7%–65.2%). However, insignificant change was noted in the post test knowledge of management of insect bite. Five questions were asked to assess the attitude of students regarding the application of first aid, and significant change was also proved by McNemar’s Chi-square test [Table 2] during post intervention assessment. Paired t-test was performed to compare the pre- and post-test scores of knowledge and attitude of the students about first aid, and there was a significant change in knowledge on first aid management of selected injuries from pretest score (mean = 1.50, standard deviation [SD] =0.47) to post test score (mean = 6.53, SD = 1.30), $P < 0.001$. To quantify the effectiveness of health education effect size (Cohen’s d) was derived. For knowledge score, Cohen’s d was 5.14 with large effect size indicating highly effective impact of the training program. Significant change was also noticed regarding attitude about first aid as evident increase of pretest score (mean = 1.19, SD = 0.96) to post test score (mean = 3.17, SD = 1.03), $P < 0.001$. The mean difference of attitude score was 1.8. Cohen’s d for attitude score was 1.88 with medium effect size.

Before the educational intervention, although every student replied in the affirmative about necessity of keeping first box handy, when they were questioned that where should the first-aid box be kept; 68.2% mentioned it should be kept in home only, 19.6% of them told it should be kept in school only, and the Table 1: Comparison of correct responses related to knowledge on first aid before and after educational intervention (n=230) Knowledge about first aid management of common injuries Correct response Pre-test N (%) Correct response Post-test N (%) Significance* Cut injury 8 (3.5) 199 (86.5) <0.001 Burn injury 8 (3.5) 200 (87) <0.001 Sprain 22 (9.2) 182 (79.1) <0.001 Fracture 38 (16.5) 175 (76.1) <0.001 Dog bite 38 (16.5) 175 (76.1) <0.001 Snake bite 5 (2.2) 55 (67.4) <0.001 Insect bite 116 (50.4) 123 (53.5) 0.452 Nose bleeding 56 (24.3) 140 (60.9) <0.001 Foreign body in the eye 66 (28.7) 150 (65.2)

Table 1: Comparison of correct responses related to knowledge & attitude on first aid before and after educational intervention (n=230)

| Knowledge score | Pre - test | Post – test* | Significance |
|--|------------|--------------|--------------|
| Cut injury | 8 | 199 | <0.001 |
| Burn injury | 8 | 200 | <0.001 |
| Sprain | 22 | 182 | <0.001 |
| Fracture | 38 | 175 | <0.001 |
| Dog bite | 38 | 175 | <0.001 |
| Snake bite | 5 | 55 | <0.001 |
| Insect bite | 116 | 123 | 0.452 |
| Nose bleeding | 56 | 140 | <0.001 |
| Foreign body in the eye | 66 | 150 | <0.001 |
| Attitude score | Pre – test | Post – test* | Significance |
| It is important to learn first aid knowledge in life | 26 | 211 | <0.001 |
| Education of first aid in schools is essential | 57 | 173 | <0.001 |
| It is only the responsibility of medical professional to save life and learn first aid | 38 | 81 | <0.001 |
| Learning first aid is very difficult and complicated | 101 | 58 | <0.001 |
| If I have adequate knowledge, I will perform the first aid | 53 | 184 | <0.001 |

Table 2: Comparison of pretest and post test scores of knowledge and attitude by paired t test

| Domain | Score mean & SD | | Mean difference (95% CI) | Effect size (Cohen's D) |
|-----------|-----------------|-----------|--------------------------|-------------------------|
| | Pre test | Post test | | |
| Knowledge | 1.5±0.47 | 6.53±1.3 | 5.02(4.7-5.2) | 5.14 |
| Attitude | 1.19±0.96 | 3.07±1.03 | 1.87(1.7-2.0) | 1.88 |

<0.001 *Mc Nemar Chi square test Table 2: Comparison of favorable responses related to attitude before and after educational intervention (n=230) Attitude regarding first aid Correct response in Pre-test N(%) Correct response in Post-test Significance* It is important to learn first aid knowledge in life 26 (11.3) 211(91.7) <0.001 Education of first aid in schools is essential 57 (24.8) 173 (75.2) <0.001 It is only the responsibility of medical professional to save life and learn first aid 38 (16.5) 81 (35.2) <0.001 Learning first aid is very difficult and complicated 101 (43.9) 58 (25.2) <0.001 If I have adequate knowledge, I will perform the first aid to the people in need 53 (23.0) 184 (80.0) <0.001 *Mc Nemar Chi square test remaining students did not know exactly where to keep the first-aid box. However, in the post intervention assessment, it was overwhelming to find 100% correct response in this regard that a first-aid box should be kept handy both at school and home.

5. Discussion

The present study revealed that all the students had heard of the name of first aid which were similar to the findings of Priyangika and Hettiarachhi in a study conducted in Sri Lanka while Dasgupta et al. reported in her study that merely (15.2%) of the study subjects knew about the correct definition of the term “first-aid.” The knowledge of students

regarding management of burns were found to be very poor in this study which was also reported by Shinde et al. from Pune in their study among high school students in December 2015. The knowledge regarding dog bite and snake bite management was also found to be poor. Similar findings were reported in a study conducted in a Government school of Chandigarh by Singh and Kaur among ninth standard students. Regarding the effectiveness of training program about selected first-aid measures among school students, the results in this study were consistent with the findings of Muneeswari B in Tamil Nadu and Sonu and Amarjit in Chandigarh, which showed that the knowledge scores improved significantly among students following planned training program. Televised material, as well as the parents, is the chief source of information about first aid among the study population which were similar to the findings of the study done in Saudi Arabia by Mobarak et al. In contrast to the positive attitude of the school students toward willingness to apply first aid if necessary, as revealed in this study, Hong Kong Red Cross in their report on “Public Knowledge and Attitude on First Aid” done in 2011 commented that although their attitude was positive, inactive to learn first aid since 55% of respondents felt that it was the responsibility of medical professionals only to save life, and perform first aid and 36% felt that learning first aid

might be difficult and complicated. Moreover, receptivity of school students toward educational intervention was also evident from the post intervention large effect size.

5.1. Strength of the study

Teaching module development after gap analysis of baseline knowledge of school students made the content of teaching appropriate and post test assessment after 15 days provided an ample opportunity to assess the power of retention of the knowledge among the students.

6. Conclusion and Recommendations

The present study revealed a perceived need for knowledge regarding first aid among school students and thus advocates that first-aid education should be made compulsory in school syllabus. This would not only enhance their skills toward emergency management of injuries but is also a crucial step forward to disseminate first-aid message in the community. The necessity of keeping a first-aid box with recommended equipment and medicines at ready disposal both at home and school would go a long way in saving a precious life.

7. Source of Funding

None.

8. Conflict of Interest

None.

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