



(RESEARCH ARTICLE)



Effectiveness of safety precaution intervention regarding use of fire crackers on knowledge and fire accidents among school children

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Abstract

Diwali is one such joyous festival which is loved and celebrated by everyone over the country as the festival of lights. It is celebrated by lighting oil lamps and firecrackers like a bomb, flowerpots, chakri, rockets, etc. Firecracker injuries are common in India, of which the majority takes place during diwali. A quasi experimental study was done to assess the effectiveness of safety precaution intervention regarding use of fire crackers on knowledge and fire accidents among school children at Government Middle school, Tiruvannamalai. 110 subjects in experimental & 110 subjects in control group were selected by using convenience sampling technique. Post test only design was used. Knowledge and fire accidents were assessed by using questionnaire and observational checklist respectively. The study findings revealed that in control group, the mean posttest score for knowledge was 9.2 whereas in experimental group, the mean score was 18.1 and the calculated t value is 8.5 shows statistically significant at $P < 0.001$ level. The mean score for fire accidents in control group is 4.19 whereas in experimental group mean score was 2.8 and the calculated unpaired t value $t = 5.5$ shows statistically significant at $P < 0.001$ level. The study concluded that safety precaution intervention is necessary to create awareness and control the fire crackers injuries among school children and they are also the message carrier.

Keywords: Fire Crackers; Knowledge; Fire Accidents; Safety Precaution Intervention

1. Introduction

Firecrackers are extensively used in India during various festivals, ceremonies and social events, as is true the world over. They find a special place during diwali, which is an annual festival marking an important Hindu mythological event.

In India, firecrackers are available for use by the common public. Each and every individual is free to light the crackers wherever he/she desires. It is a well-known fact that whenever firecrackers are used, there is always a risk of burn and injury. Hence, firework-related injuries are encountered the world over. Both the developed and developing countries are facing the problem of firecracker-related injuries in large numbers.

Pediatric population is the commonest target of firecracker injuries due to lack of parental guidance and supervision. It usually leads to burns of skin, damage of myofascial planes and fractures of phalanges in upper extremities. If exploded near the face, firecrackers can cause irreparable damage to facial structures including eyes and ears apart from varying degrees of burns (Upadhyaya DN & Khanna V, 2012).

In regards to fireworks injuries, the hands (40%), eyes (20%), and head and face (20%) are the body areas most often involved. Half of those who receive injuries are simply bystanders. Children, who are unsupervised, are 11 times more likely to receive fireworks injuries (Abhijeet Wahegaonkar, 2014). The Tamilnadu government (2023)

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announced that “Firing of rocket crackers near huts or multi-storey flats is completely banned” and people are allowed to burst crackers between 6am to 7am and 7pm to 8pm.

On assessing the incidence of fire crackers accidents among school children is high and there is a gap in the literature review related to awareness on prevention of fire crackers injuries. Considering the whole background, the researcher is interested to assess the effectiveness of safety precaution intervention regarding use of fire crackers on knowledge and fire accidents among school children.

1.1. Statement of the problem

A study to evaluate the effectiveness of safety precaution intervention regarding use of fire crackers on knowledge and fire accidents among school children in selected school at Tiruvannamalai.

1.2. Objectives

- To assess the post test score of knowledge on fire crackers and fire accident in experimental and control group of school children.
- To compare the post test score of knowledge on fire crackers and fire accident between the experimental and control group of school children.
- To associate the post test score of knowledge on fire crackers and fire accident in experimental and control group with their selected demographic variables.

1.3 Null hypothesis

- NH1- There is no significant difference in post test score of knowledge on fire crackers and fire accidents between the experimental and control group of school children at $p < 0.05$ level.
- NH2- There is no significant association of post test score of knowledge on fire crackers and fire accidents with their selected demographic variables in experimental group and control group at $p < 0.05$ level.

2. Material and methods

2.1. Research approach & design

Quantitative research approach and quasi experimental - Non equivalent control group post test only design was used

2.2. Variables

- **Independent variables** – Safety precaution intervention
- **Dependent variables** - Knowledge & fire accidents

2.3. Setting of the study

The study was conducted in Government middle school, Edapalayam (Experimental group) and Government middle school, Thenmathur (Control group), Tiruvannamalai, Tamilnadu, India.

2.4. Sample size and Sampling technique

Convenience sampling technique was adopted based on the sample collection criteria and 220 school children were selected (110 in experimental and 110 in control group).

2.5 Participants

School children with the age group of 8th to 13^{en} years

2.6 Intervention

The researcher has implemented the safety precaution intervention through the lecture cum discussion by using slide show for 20 minutes, lived experience video show for 10 minutes and drama for 30 minutes in experimental group. The control group followed routine activities.

2.7 Measurements and tool

The researcher was collected the information regarding demographic variables by using questionnaire in both the groups. Level of knowledge was assessed by using questionnaire and fire accidents by using observational checklist in experimental and control group.

3 Results and discussion

3.1 The major findings of demographic variables are

In the experimental group, 58 (52.7%) subjects were between the ages of 10-11 years, 57 (51.8%) were male, 98 (89%) subjects belongs to Hindu, 69 (62.7%) subjects were studying in primary level, 56 (50.9%) subjects were living in a joint family, 45 (40.9%) subjects were living with two siblings, 85 (77.2%) parents were going for daily wages, 90 (81.8%) subjects family income is >5000, 39 (35.4%) subjects were interested in using pencil cracker, ground spinner, garland, rocket and bomb (Lakshmi) fire crackers (Supported by Kalita, Kabita; Gurindagunta, Swamy Vivek, 2021) and 73 (66.3%) subjects had not injuries previously.

In the control group, 50(45.4%) subjects were in the age of 12 – 13years (Bhatnagar A, Gupta SK, Rakesh N, et al., 2023), 57(51.8%) were male, 95 (86.3%) subjects belongs to Hindu, 57(51.8%) subjects were studying in secondary level, 56(50.9%) subjects were living in a nuclear family, 43(39.1%) subjects were living with two siblings, 82(74.5%) parents were going for daily wages, 87(79%) subjects family income is >5000, 39(35.4%) subjects were interested in using pencil cracker, ground spinner, rocket and bomb (Lakshmi) fire crackers and 73(66.3%) subjects were not had injuries previously.

3.2 Assess the post test score of knowledge on fire crackers and fire accident in experimental and control group of school children

(N=110+110)

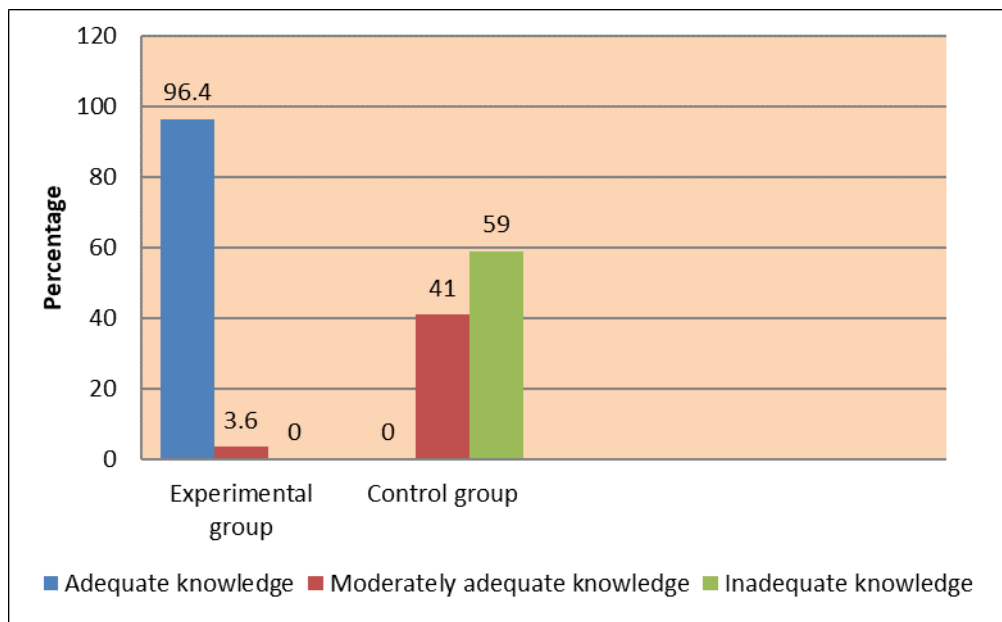


Figure 1 Percentage distribution of posttest score of knowledge among school children in experimental and control group

N=110+110

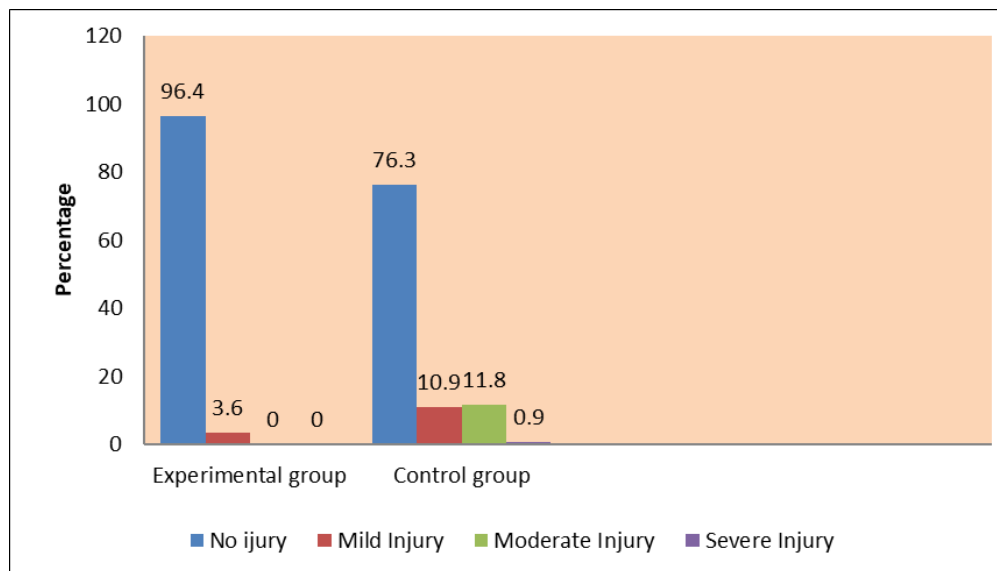


Figure 2 Percentage distribution of posttest score of fire accidents among school children in experimental and control group

A study done in **Guwahati** shows that 54.3% (106) cases are affected with fire-cracker related burn injuries and 46.2% of the cases were under the age of 19 years (**Kalita, Kabita; Gurindagunta, Swamy Vivek, 2021**)

3.3 Comparison of post test scores of knowledge and fire accidents

Table 1 Comparison of posttest scores of knowledge and fire accidents between experimental and control group among school children N = 110+110

Variables	Experimental		Control		Unpaired “t” value
	MEAN	SD	MEAN	SD	
Knowledge	18.1	1.99	9.2	1.82	t= 8.5 S**
Fire accidents	2.8	1.1	4.19	2.2	t= 5.5 S

S** - Significant at P<0.01 level, S –Significant at P<0.05 level

This clearly shows that the implementation of safety precaution intervention had a significant improvement of knowledge and reduction of fire accidents between the experimental and control group of school children.

Hence the **null hypothesis (NH1) stated** earlier that “there is no significant difference in post test score of knowledge on fire crackers and fire accidents between the experimental and control group of school children at p<0.05 level” which was rejected in experimental group and retained in control group.

3.4 Association of post-test score of knowledge and fire accidents in experimental and control group of school children with there are selected demographic variables

There is no significant association of post test score of knowledge on fire crackers and fire accidents with their selected demographic variables in experimental group and control group at p<0.05 level. Hence the null hypothesis (NH₂) was accepted.

3.5 Implication for nursing practice

Mock drill can be arranged by the community health nurse in prevention of fire accidents and managing fire accidents due to fire crackers at the primary level.

4 Conclusion

The present study was conducted to assess the effectiveness of safety precaution intervention regarding use of fire crackers on knowledge and fire accidents among school children at Tiruvannamalai. The study finding revealed that there was a statistically significant difference in the score of knowledge and fire accidents after implementation of safety intervention programme and this proved to be an effective. This study concluded that fire crackers injuries are prevalent in the productive age groups. Public awareness on prevention of fire cracker injuries and education along with an increase in legislative enforcement are more imperative to control the fire accidents and create a pollution free country.

Compliance with ethical standards

Disclosure of conflict of interest

No Conflict of interest to be disclosed

Statement of informed consent

Informed consent was obtained from all parents of school children included in the study.

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