A STUDY ON IMPACT ASSESSMENT OF HEALTH EDUCATION INTERVENTION ON ROAD SAFETY AND ACCIDENT PREVENTION AMONG PRIMARY SCHOOL CHILDREN OF TADONG GOVERNMENT SCHOOL, EAST SIKKIM

Shuva Das Gupta, Ankur Barua, Bani Mitra, Hishey Lamu Bhutia, Sonam Zangmu Sherpa

College of Nursing, Department of Community Medicine, Sikkim-Manipal Institute of Medical Sciences (SMIMS), 5th Mile Tadong, Gantok, Sikkim, India

Abstract **:** The health education materials for Road Traffic Accident (RTA) prevention were developd on the basis of information on "road safety and accident prevention" provided in the WHO brochure for 2004. Content validity was assessed by the experts in the field of community medicine and college of nursing and instruments were modified according to their recommendations. Conducting a pre-test in five children of 5th Mile Tadong for feasibilty. acceptability, time managent and expenses, assessed reliability; the data collected were used as a guide to modify the instruments accordingly. Proportions were used to derive information on baseline characteristics. Paired-t-test was used to compare the pre-test and post-test results of KAP on RTA prevention among the experimental and the control groups, separately. Chi- square test was applied to the pre-test and post-test results between both the groups to assess the impact of health education intervention on RTA prevention. Significant improvement in the knowledge between both the groups was observed in the following asspects: (a) RTA could be prevented by minimal presence on roads. (b) RTA could be prevented by avoiding playing on roads. (c) RTA could be preventing by respecting trafic signals. Significant improvement in positive attitude was observed by are : (a) Waiting for the elders to accompany them even when they are late for school. Significant Improvement in practice regarding RTA prevention showed improvement in the following aspects: (a) Use of helmets even by a pillon rider. (b) Always following traffic rules. This indicates the effectiveness of the health education intervention on troad safety and accident prevention measures among the primary school children.

Key Words: Road Traffic Accident, School Children, Health Education, Paired t-test, Chi- square test

INTRODUCTION

A significant number of children in developed and developing countries are subjected to Road Traffic Accident (RTA) which is currently placed at 9th position in the list of global burden of disease. It has been projected to become the 3rd most leading contributor to the global burden of disease by 2020. the World Health Organization, in its effort to control the alarming increase of RTA and road fatalities, recognized World Health Day on 7th April 2004, to provide and opportunity to focus the worlds' attention on the problem of RTA. [1,2,3]

A study conducted by Jha N. et al[4,5] from South India revealed that among 726 RTA victims, 83% among them were males while only 17% females. Among various injuries limb and the face were commonly affected areas to suffer external injuries head injuries were the commonest form of internal injuries seen in the victims (34.1%) These injuries were common among bicycle riders, pedestrians and riders of motorized two wheelers. [4,5]

Vakilli R. et al, [6] in their study showed that the age most prone for accident was between 12-16 years, followed by age group 4-8 years; 20.7% of all accidents were motor vehicle accidents. They suggested that preventive measures are needed to be taken for children regarding strict and definite traffic rules to prevent RTA in children, [6] There is a need for road safety education directed towards students. Pre-school children may be introduced to elementary concepts of road safety through stories. Primary school children may be given practice guidance on the use of side walls and road crossing technique.[7]

Due to hilly terrain locations and lack of facilities of playgrounds, the children of Sikkim often make roads as their playground. Since most of children dwell from family of illiterate parents, they are unaware of basic road-traffic rules. With increase in road fatalities every year, many children either die or get disabled for rest of their lives due to RTA. Thus, a structured health education intervention is necessary for primary school going children, to reduce the rate of road fatalities in the state.

Correspondence: **Dr. Ankur Barua,** Assistant Professor, *Department of Community Medicine,Fax: (03592) 231496, e-mail : ankurbaru26@yahoo.com*

MATERIALS AND METHODS

Tadong, Government Senior Secondary School of East Sikkim, Gangtok has a total capacity of 2000 students from different parts of Gangtok, East Sikkim. The study group was constituted by students from 5th standard of the age group of 9 to 16 years. Most of them resided in nearby localities and traveled to school on foot. Majority belonged to middle- class families. The school is located along the national highway NH 31 A.

Study Design: An experimental study (Randomised Control Trial) of health education intervention. *Setting:* Tadong, Government Senior Secondary School, Gangtok East Sikkim. *Study Population:* 102 students of primary level of class V from Section "A" and "B".*Sample Size(N):* Total sample size was 102. Out of which Experimental group comprised of 51, control comprised of 51 students. *Sampling Technique:* Randomisation Technique was applied to select the experiment and control groups after study obtaining informed verbal consent from participants of this study.

Inclusion Criteria: (i) All students of selected class and sections, (i.e. sections A and B of fifth standard).(ii) Students who were present at the time of pre-test & gave informed verbal consent to participate in the study.

(b) *Exclusion Criteria:* Students who were absent during the pre-test were excluded from this study.

Study Instruments (i) A 22- item structured pre-test questionnaire, with four parts: (a) PART-I of the questionnaire items were for the assessment of trhe socio-demographic profile of the students. (b) PART-II was for assessing the knowledge of primary school children regarding Road Safety and Accident Prevention. (c) PART-III for assessing attitude of primary school children towards Road Safety and Accident Prevention. (d) PART-IV for assessing the practice of primary school children regarding Road Safety and Accident Prevention (ii) A 15- item structured health education module of "Road Safety and Accident Prevention". The instrument was developed on the basis of the information on " Road Safety and Accident Prevention" provided in the WHO brochure for 2004. Experts in the

field of Nursing, Community Medicine, Pediatrics, Medicine & Surgery assessed the content validity and its appropriateness to be applied for primary school children. The tool was modified according to their suggestions and recommendation. Nepali Version of health education material was developed in consultation with literate expert in the language. Pre- testing was done in five students and data discarded to assess the feasibility, acceptability, time management and expenses.

Data collection Procedure After procuring permission from the principal of the school, the students of class five were approached for data collection. After obtaining informed verbal consent from students, the study & control groups were chosen through Randomization method by picking up lots. Section B was chosen for the study group and section A for the control group by lottery method. Students from both the section from both groups were interviewed using the structured pre-Test questionnaire and data collected regarding their existing knowledge, Attitude and Practice on Road Safety and Accident Prevention Measures. A second visit was made the following day and a structured health education intervention was implemented only to the experiment group. A third visit was made a week later and Post-Test was administered to both the experiment and the control groups. The responses were recorded for analysis. The teachers of this school were provided with copies of WHO brochure, 2004 and the children were provided with a calendar depicting 'ROAD SAFETY TECHNIQUES'. Finally, health education regarding RTA prevention was administered to all participants in this study which also reinforced the existing knowledge of study group.

Data Analysis Data collected was tabulated and analyzed with respect to the Pre-Test scores of study and control groups by using the Statistical Package for Social Sciences (SPSS) version 10.0. The results were expressed in terms of means & their standard deviations. Paired t-test and Chi-square tests were applied wherever applicable. A p-value <0.05 was considered as statistically significant.

RESULTS

Baseline Characteristics

Majority (58%) of the subjects belong to the age group of 9-12 years. Proportions of males were more in this age group (53%). Proportions of females were more in the age group of 13-16 years, accounting for 51% of the parents were literate among them, 75% fathers and 46% mothers were literates.

Table-1 shows significant improvement in knowledge after health education intervention regarding following issues; Prevention of RTA by following (a) traffic rules and respecting traffic signals, (b) being careful on road, (c) avoiding playing on road, (d) following proper precautions while crossing road in the plains and in hilly terrains and (e) stating the risk factors of RTA as negligence, ignorance regarding traffic rules and drunken driving (f) correct responses for traffic light signals and their indicators. However, knowledge regarding prevention of RTA by avoiding playing on the road and by being careful on the road. Needs suggests further reinforcement.

Table 1: *Pre – Test and Post- Test results of Study group on Knowledge regarding RTA prevention*

Sl. N0.	KNOWLEDGE	PRE – TEST (n=51) Mean ± SD	POST – TEST (n=51) Mean ± SD	P – value
1.	If proper precaution taken, RTA could be prevented	10.5 ± 0.5	2.0 ± 0.00001	0.0001*
2.	Following traffic rules could prevent RTA	1.4 ±0.5	1.9±0.3	0.0001*
3.	Being careful on the road could prevent RTA	1.3 ±0.4	1.0±0.2	0.0001*
4	RTA could be prevented by avoiding playing on road	1.4 ±0.5	1.1±0.2	0.0001*
5	Negligence, Ignorance and Drunken Driving are risk factors fro RTA	1.4 ±0.5	1.9±0.3	0.0001*
6	Correct responses for traffic light signals & their indicators	1.1 ±0.3	2.0.9±0.00001	0.0001*
7	Precautions need to be taken while crossing road in plains	1.6 ±0.5	2.0±0.00001	0.0001*
8	Precaution need to be while crossing road in hilly terrain	1.9 ±0.3	2.0±0.00001	0.0001*

** p value ,0.05 is considered as significant*

Table 2: *Pre – Test and Post- Test results of Study group on attitude regarding RTA prevention*

Sl. N0.	ATTITUDE	PRE – TEST (n=51) Mean ± SD	POST – TEST (n=51) Mean ± SD	P – value
1.	Willing to practice road safety measures in daily life	1.4 ± 0.4	2.0 ± 0.00001	0.0001*
2.	Paying attention to traffic rules even in hurry.	1.5 ± 0.5	2.0 ± 0.00001	0.0001*
3.	Waiting for elders to accompany when late for school.	1.2 ± 0.4	2.0 ± 0.00001	0.0001*

* p value ,0.05 is considered as significant

Table-2 shows significant improvement in positive attitude of the subjects towards RTA prevention after effective health education intervention.

Table 3: *Pre – Test and Post- Test results of Study group on practice regarding RTA prevention*

Sl. N0.	PRACTICE	PRE – TEST (n=51) Mean ± SD	POST – TEST (n=51) Mean ± SD	P – value
1.	Always looking to both sides before crossing roads.	1.2 ± 0.3	2.0 ± 0.00001	0.0001*
2.	Always used seat belts while traveling in car	1.1 ± 0.3	1.9 ± 0.3	0.0001*
3.	Always used helmets even as a pillion rider	1.3 ± 0.5	2.0 ± 0.1	0.0001*
4.	Always following traffic rules	1.4 ± 0.5	2.0 ± 0.0001	0.0001*

* p value ,0.05 is considered as significant

Table-3 reveals that after health educational intervention, the subjects showed significant improvement in their practices regarding RTA prevention as depicted by multiple responses to the questions put for assessing the practice. This finding suggested that the health education intervention was effective in reinforcing road safety practices among the subjects.

Table 4: *Pre – Test and Post- Test results of control group on knowledge regarding RTA prevention*

Sl. N0.	KNOWLEDGE	PRE – TEST (n=51) Mean ± SD	POST – TEST (n=51) Mean ± SD	P – value
1.	If proper precautions taken, RTA could be prevented	1.5 ± 0.5	1.7 ± 0.4	0.007*
2.	RTA could be prevented by following traffic rules	1.4 ± 0.5	1.6 ± 0.5	0.0001*
3.	Being careful on the road could prevent RTA	1.7 ± 0.5	1.2 ± 0.4	0.001*
4.	RTA could be prevented by avoiding playing on road	1.2 ± 0.4	1.1 ± 0.2	0.013*
5.	Negligence, ignorance and Drunken Driving are risk factors for RTA	1.5 ± 0.5	1.9 ± 0.3	0.0001*
6.	Correct responses for traffic light signals & their indicators	1.5 ± 2.8	1.2 ± 0.4	0348
7.	Precautions need to be taken while crossing road in plains	1.6 ± 0.4	1.7 ± 0.5	0.103
8.	Precaution need to be taken while crossing road in hilly terrain	1.8 ± 0.4	1.8 ± 0.4	0.709

* p value ,0.05 is considered as significant

Table-4 shows that there is significant improvement in the knowledge of the subjects regarding RTA prevention is issues related to its prevention by following proper precaution and by following traffic rules and also stating of risk factors RTA as negligence, ignorance and drunken driving. This improvement in the knowledge of the control group could be due to the reason that diffusion of knowledge might have occurred from the study group to the control group. Also the control group, might have acquired knowledge from there teachers, parents, near- relatives and elders, after the pre-test was conducted.

Table 5 shows that there was no significant improvement of attitude in control group regarding RTA prevention as majority already had positive attitude towards practicing road safety measures and paying attention to traffic rules during Pre-Test.

Table 5: *Pre – Test and Post- Test results of control group on attitude regarding RTA prevention*

Sl. N0.	ATTITUDE	PRE – TEST (n=51) Mean ± SD	POST – TEST (n=51) Mean ± SD	P – value
1.	Willing to practice road safety measures in daily life	1.8 ± 0.4	1.7 ± 0.4	0.569
2.	Paying attention to traffic rules even in hurry.	1.5 ± 0.5	1.5 ± 0.5	0.322
3.	Waiting for elders to accompany when late for school.	1.1 ± 0.3	1.2 ± 0.4	0.322

* p value ,0.05 is considered as significant

Table 6 reveals significant Improvement in practice regarding RTA prevention in the following aspects: (a) Always looking to both sides before crossing the road, (b) using seat belts and (c) always following the traffic rules. This improvement may be attributed to the fact that subjects,

Table 6: *Pre – Test and Post- Test results of controll group on practice regarding RTA prevention*

Sl. N0.	PRACTICE	PRE – TEST (n=51) Mean ± SD	POST – TEST (n=51) Mean ± SD	P – value
1.	Always looking to both sides before crossing roads.	1.2 ± 0.4	1.3 ± 0.4	0.024*
2.	Always used seat belts while traveling in car	1.0 ± 0.2	1.1 ± 0.3	0.044*
3.	Always used helmets even as a pillion rider	1.4 ± 0.5	1.4 ± 0.5	0.322
4.	Always following traffic rules	1.6 ± 0.5	1.7 ± 0.5	0.013*

out of curiosity and interest to learn more, might have consulted their parents, elders, teachers and even their friends in the experimental group after the Pre-Test was conducted. This clearly shows that the Pre-Test questions were successful in arousing enough curiosity and interest among control group to learn more about RTA prevention.

Table 7 shows the comparison between both experimental and control group on proportion of appropriate/correct responses in pre-test and post-test on knowledge of Attitude & Practice (KAP) regarding RTA.

(1) Improvement in knowledge of study group was observed to be higher in post-Test as compared to the control group. This difference could be attributed to effective health education intervention. The difference in correct responses of study and control group was found to be statistically significant regarding the following aspects ; (a) RTA could be prevented by being careful on roads, (b) RTA could be prevented by avoiding playing on road and (c) Correct responses for traffic light signal and their indicators.

(2) Improvement in positive attitude of study group was also found to be significantly higher in Post-Test as compared to the control group regarding (a) willingness to pay attention to traffic rules even when in a hurry and (b) willingness to wait for elders to accompany even when getting late for school.

(3) Change in practice RTA preventive norms of study group was observed to be significantly higher in post-test as compared to the control group regarding the following aspects: (a) always looked to both sides before crossing road and, (b) always used seat belts while traveling in car. But the difference in practice of study and control group was found to be statistically significant regarding (a) always used helmets even as a pillion rider and (b) always followed traffic rules. The above findings confirm that improvement in knowledge, Attitude & Practice of the study group regarding RTA prevention in significantly higher in Post-Test as compared to control group due to effective health education intervention.

Table 7 : *Comparison between both study and control groups on proportion of appropriate/correct responses in pre-test & post-test on kap regarding RTA*

SL NO.	KNOWLEDGE	GROUP	(Post-Test) (%)	(Post-Test) (%)	X2 (Yates corrected wherever applicable), p value
1.	RTA could be prevented by following traffic rules	Experimental	41	90	2.79, p= 0.095
		Control	35	59	
2.	RTA could be prevented by being careful on roads	Experimental	26	4	15.62 p= 0.00007*
		Control	65	24	
3.	RTA could be prevented by avoiding playing on road	Experimental	37	6	4.82 P= 0.028*
		Control	18	24	
4	Major risk factors of RTA are negligence, ignorance & drunken driving	Experimental	41	88	0.15, p= 0.615
		Control	47	88	
5.	Correct responses for traffic light signals & their indicators	Experimental	10	100	22.8 p= 0.000002*
		Control	16	18	
SL NO.	ATTITUDE	GROUP	(Post-Test) (%)	(Post-Test) (%)	X2 (Yates corrected wherever applicable), p value
6.	Willing o pay attention to traffic rules even when in a hurry	Experimental	55	100	3.66, p= 0.056
		Control	51	55	
7	Willing to wait for elders to accompany even when getting late for school	Experimental	24	100	8.08, P= 0.004*
		Control	65	24	
SL NO.	ATTITUDE	GROUP	(Post-Test) (%)	(Post-Test) (%)	X2 (Yates corrected wherever applicable), p value
8.	Always looking to both sides before crossing roads.	Experimental	8	100	0.01, P= 0.941
		Control	24	33	
9.	Always used seat belts while traveling in car	Experimental	12	88	2.98, P= 0.078
		Control	6	14	
10.	Always used helmets even as a pillion rider	Experimental	28	98	12.45, P=0.0004*
		Control	35	39	
11.	Always following traffic rules	Experimental	35	100	10.1, P=0.001*
		Control	59	71	

* p value ,0.05 is considered as significant

SUMMARY AND CONCLUSIONS

An study was conducted among 102 primary school children of Tadong, Government Senior Secondary School, Gangtok on lmpact of structured health education intervention on knowledge, attitude and practice regarding Road Safety and Accident Prevention. 51 students from fifth standard constituted the study group and 51 constituted control group. Among the studyand control group, significant improvement in knowledge was observed in the following aspects: (a) RTA could be prevented by being careful on road. (b) RTA could be prevented by avoiding playing on road. (c) RTA could be prevented by respecting traffic light signals. Improvement in attitude was observed in both the groups regarding waiting waiting for elder to accompany them to school even when they are late. Practice regarding RTA prevention showed improvement in the following aspects : (a) Use of helmets even as a pillion-rider & (b) All time following traffic rules. This indicates the efficacy of the health education intervention regarding RTA prevention among the primary school children.

LIMITATION

The study was limited to the students who were available during the study period & informed verbal consent to participate in the study. Since the proportion of non-cooperative students and those who were absent during pre-test interview days was very smallwe expect only a minimal effect on the results.

REFERENCES

1. The World Health Organization. World Health Report: New understanding New Hope Geneva: The institute; 2001
2. The World Health Organization. News Letter. SCN department. Disability , violence, injury prevention and rehabilitation. South East Asia Regional office, New Delhi: the institute. 2000;2(1)
3. Murray C.L.I., lopez A.D. The global Burden of Disease: A comprehensive assessment mortality and disability from disease injuries and risk factors in 1990 and projected to 2020. Harvard school of Public Health. Bhoston; 1996
4. Jha N., Srinvasa D.K., Roy G, Jagdish S. Epidemiological study of Road Traffic Accident Case – A study from South India. Indian Journal of community Medicine. 2004 (July – Sep); 125-7
5. Jha N., Srinvasa D.K., Roy G, Injury pattern among road traffic accident cases- A study from south India. Indian Journal of community Medicine. 2003 (April- June); 28(2):85-9
6. Vakilli R., Farivar K. Critical Review of Epidemiology and predisposing factors of accident in children. Saudi Journal of Disability and. Rehabilitation. 2003 (Jan – March); 9(1):37
7. The World Health Organization. Technical Report Series No. 73: Road Traffic Accidents in developing Countries. Geneva: The institute; 1984