RESEARCH PAPER

Effectiveness of Structured Teaching Program on Knowledge Regarding Prevention and Control of Rabies among High School Students at Selected Schools: A Quasi-Experimental Study

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ABSTRACT

Rabies is a fatal but preventable zoonotic disease and remains an important public health concern, particularly in developing countries. Children and adolescents are at increased risk because of frequent interaction with animals and inadequate awareness regarding appropriate wound care, post-exposure prophylaxis, and preventive measures. School-based educational interventions may therefore play an important role in improving rabies-related knowledge.

Objective: To assess the effectiveness of a Structured Teaching Programme on knowledge regarding the prevention and control of rabies among high school students in selected schools.

Methods: A quantitative approach with a quasi-experimental one-group pre-test–post-test design was adopted. A total of 70 high school students were selected using a non-probability convenience sampling technique. Data were collected using a self-structured 30-item multiple-choice knowledge questionnaire. The reliability coefficient of the tool was 0.9847. A pre-test was conducted before administering the Structured Teaching Programme, followed by a post-test using the same questionnaire. Data were analysed using descriptive and inferential statistics.

Results: In the pre-test, 58.57% of students had average knowledge, 34.29% had poor knowledge, and only 7.14% had good knowledge. In the post-test, 61.43% demonstrated very good knowledge, 24.29% had good knowledge, and 14.29% achieved excellent knowledge. The mean knowledge score increased from 7.74 ± 2.98 in the pre-test to 20.71 ± 3.21 in the post-test, with a mean difference of 12.97 ± 4.68. The improvement was statistically significant ($t = 23.18$, $df = 69$, $p = 0.0001$). Age, standard of education, and type of family showed significant associations with pre-test knowledge scores ($p < 0.05$), whereas other demographic variables were not significant.

Conclusion: The Structured Teaching Programme was effective in significantly improving knowledge regarding rabies prevention and control among high school students. Incorporating structured rabies education into school health programmes may enhance awareness, promote timely preventive practices, and contribute to rabies control.

Key words: Rabies; Structured Teaching Programme; Knowledge; High School Students; Prevention and Control

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INTRODUCTION

Rabies is an acute, progressive and almost invariably fatal zoonotic encephalitis caused by a neurotropic virus of the Lyssavirus genus, family Rhabdoviridae. Human infection occurs predominantly through the bite, scratch or saliva exposure of an infected animal, with domestic dogs accounting for the majority of human rabies transmission. Once clinical manifestations such as hydrophobia, aerophobia, agitation, paralysis and encephalitis develop, the disease is nearly 100% fatal.[1] Despite this high case-fatality rate, rabies is preventable through timely wound management, appropriate post-exposure prophylaxis, vaccination of dogs and effective community-based preventive strategies [2.,3]

Rabies continues to represent a substantial global public health burden, particularly in low- and middle-income countries of Asia and Africa. Children and adolescents are considered especially vulnerable because of frequent interaction with animals, limited risk perception and inadequate knowledge regarding appropriate actions following animal exposure.[4] India contributes substantially to the global rabies burden, with approximately 96% of rabies-related morbidity and mortality in the country associated with dog bites.[5] Earlier estimates have indicated nearly 20,000 human rabies deaths annually in India, representing a considerable proportion of the estimated 59,000 global deaths attributed to rabies each year.[6] These figures highlight the continuing need for effective prevention, early treatment-seeking behaviour and community awareness.

Immediate washing of bite wounds with soap and running water, prompt medical consultation, administration of anti-rabies vaccine and rabies immunoglobulin when indicated are critical measures for preventing human rabies following exposure.[3] However, inadequate knowledge and inappropriate first-aid practices remain important barriers to effective prevention.[7] School students therefore constitute an important target population for rabies education because knowledge acquired during adolescence can influence personal behaviour and may also be disseminated within families and communities.[8]

Evidence suggests that structured educational interventions can significantly improve knowledge related to zoonotic diseases and rabies among school children.[9,10] Therefore, the present quasi-experimental study was undertaken to evaluate the effectiveness of a Structured Teaching Programme on knowledge regarding the prevention and control of rabies among high school students in selected schools.

Need of the Study

Rabies remains an important public health challenge despite being almost entirely preventable through appropriate wound care, vaccination, and timely post-exposure prophylaxis. Globally, rabies causes an estimated 59,000 human deaths annually, and approximately 40% of affected individuals are children below 15 years of age. Dog-mediated transmission is responsible for nearly 99% of human rabies cases, indicating that a substantial proportion of rabies mortality can be prevented through effective awareness and preventive interventions.[11] India contributes approximately 36% of global rabies deaths, with an estimated 18,000–20,000 deaths occurring annually. The reported incidence of animal bites is approximately 6.6 per 1,000 population, with children and adolescents representing an important risk group.[12]

The burden is also evident at the regional level. In Maharashtra, an increase in reported rabies cases was observed during and after the COVID-19 period, with delayed or inadequate treatment following dog bites considered an important contributing factor.[13] In Nagpur Municipal Corporation limits alone, 4,361 dog-bite cases were reported between January and May 2024, averaging approximately 29 cases per day, along with reported rabies-related deaths.[14] These figures demonstrate the continuing risk of rabies exposure and reinforce the need for preventive education.

Inadequate knowledge regarding rabies transmission, immediate wound washing, post-exposure prophylaxis, and the importance of prompt medical consultation may contribute to delayed treatment and inappropriate practices.[15,16] High school students are particularly vulnerable because of frequent outdoor activity, interaction with animals, limited supervision, and misconceptions regarding animal bites.[17] School-based education therefore offers an important opportunity for early behavioural modification and promotion of appropriate preventive practices.[18]

Previous intervention studies have demonstrated significant improvement in rabies-related knowledge following planned or structured teaching programmes among school students.[19,20] Educated students may additionally function as health-information disseminators within their families and communities.[21] Therefore, the present study was considered necessary to evaluate the effectiveness of a Structured Teaching Programme in improving knowledge regarding the prevention and control of rabies among high school students.

Aim

To assess the effectiveness of structured teaching program on knowledge regarding Prevention and Control of Rabies among high school students at selected high schools

OBJECTIVES

Primary Objective:

To assess the pre-test and post-test knowledge score regarding prevention and control of rabies among high school students at selected high schools

Secondary Objectives:

To assess the effectiveness of structured teaching program on knowledge regarding prevention and control of rabies among high school students at selected schools.

MATERIALS AND METHODS

Research Approach and Design

A quantitative research approach was adopted for the present study. A quasi-experimental one-group pre-test–post-test research design was used to evaluate the effectiveness of a Structured

Study Setting and Population

The study was conducted among high school students studying in selected schools located in rural, urban, and semi-urban areas after obtaining permission from the concerned authorities.

Sample Size and Sampling Technique

A total of 70 high school students were included in the study. Participants were selected using a non-probability convenience sampling technique.

Eligibility Criteria

High school students who were available at the time of data collection and willing to participate were included in the study. Students below 14 years of age and those who had previously attended any seminar or formal educational programme regarding the prevention and control of rabies were excluded.

Development and Description of the Tool

The data collection instrument was developed by the investigator based on the study objectives, an extensive review of textbooks, scientific literature, journals, reports, theses, online resources, and consultation with subject experts.

mark and each incorrect response was awarded zero, resulting in a possible total score ranging from 0 to 30, with higher scores indicating greater knowledge.

Validity and Reliability

Content validity of the study instrument was established through evaluation by 15 experts, including 11 experts in Community Health Nursing, one expert in Child Health Nursing, one

Data Collection Procedure

Following administrative permission and informed consent/assent as applicable, the pre-test was administered using the structured knowledge questionnaire. Subsequently, the participants received the Structured Teaching Programme regarding the prevention.

Statistical Analysis

The collected data were organized, coded, tabulated, and analysed using descriptive and inferential statistics. Frequencies and percentages were used to summarize categorical variables, while mean and standard deviation were used to describe knowledge scores

RESULT

Demographic characteristics of High School Students

The demographic profile of the 70 high school students showed that the majority, 44 (62.9%), were 14 years of age, followed by 15 (21.4%) aged 16 years and 11 (15.7%) aged 15 years. Most participants were male, 45 (64.3%), while 25 (35.7%) were female.

Regarding educational status, half of the students, 35 (50.0%), were studying in 8th standard, followed by 20 (28.6%) in 9th standard and 15 (21.4%) in 10th standard. More than half of the students, 36 (51.4%), belonged to families with a monthly income of ₹21,000 or above. A large majority, 63 (90.0%), resided in urban areas.

With respect to parental occupation, 28 (40.0%) fathers were self-employed and 26 (37.1%) were employed in the private sector. Most mothers, 52 (74.3%), were homemakers. More than half of the students, 40 (57.1%), belonged to joint families, whereas 27 (38.6%) belonged to nuclear families.

Regarding previous knowledge about the prevention and control of rabies, the majority of students, 51 (72.9%), reported having no prior knowledge, while only 19 (27.1%) reported previous awareness. Among the 19 students who had prior knowledge, parents were the major source of information for 16 (84.2%), while 3 (15.8%) reported friends as their source. No students reported relatives, health professionals, media, or other sources as sources of prior information.

Assessment of Level of Pre-Test Knowledge Regarding Prevention and Control of Rabies Among High School Students from Selected Schools

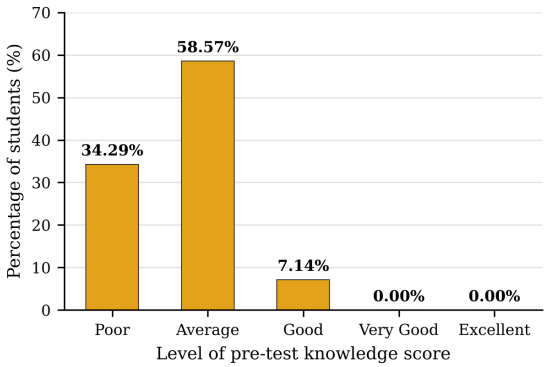


Fig.1: Bar Diagram Showing Assessment with pre-test knowledge score regarding Prevention and Control of Rabies among high school students from selected schools

Figure 1 illustrates the distribution of pre-test knowledge scores regarding the prevention and control of rabies among 70 high school students. The majority of students, 41 (58.57%), had an average level of knowledge, while 24 (34.29%) had poor knowledge. Only 5 (7.14%) students demonstrated a good level of knowledge, and none of the students had very good or excellent knowledge in the pre-test. The overall mean pre-test knowledge score was 7.74 ± 2.98, with scores ranging from 1 to 15 out of a maximum possible score of 30. These findings indicate that the students had generally inadequate baseline knowledge regarding rabies prevention and control prior to administration of the Structured Teaching Programme.

Assessment of Level of Post-Test Knowledge Regarding Prevention and Control of Rabies Among High School Students from Selected Schools

Table 1: Table showing that Assessment with level of post-test knowledge regarding Prevention and Control of Rabies among high school students from selected schools.

n= 70

Level of post-test knowledge score	Score Range	Level of Post-test Knowledge Score		Mean	SD
		Frequency	Percentage (%)		
Poor	0-6	0	0	20.71	3.21
Average	7-12	0	0		
Good	13-18	17	24.29		
Very Good	19-24	43	61.43		
Excellent	25-30	10	14.29		
Minimum score		15			
Maximum score		29			

Table 1 shows the post-test knowledge scores regarding the prevention and control of rabies among 70 high school students. The majority of students, 43 (61.43%), had a very good level of knowledge, followed by 17 (24.29%) who had good knowledge and 10 (14.29%) who achieved an excellent level of knowledge. None of the students had poor or average knowledge in the post-test.

The mean post-test knowledge score was 20.71 ± 3.21, with scores ranging from 15 to 29 out of a maximum possible score of 30. Thus, Table 1 indicates a marked improvement in students' knowledge regarding the prevention and control of rabies following the Structured Teaching Programme.

Evaluation of the Effectiveness of Structured Teaching Program on Knowledge Regarding Prevention and Control of Rabies among High School Students from Selected School

Table 2: Table showing Significance of difference between knowledge score in pre-test and post-test of High School Students regarding Prevention and Control of Rabies

n=70

Test	Mean	SD	Mean Difference	t-value	Table value	df	p-value	Level of significance
Pre Test	7.74	2.98	12.97±4.68	23.18	1.98	69	0.0001	S, p<0.05
Post Test	20.71	3.21						

Table 2 shows the significance of the difference between the pre-test and post-test knowledge scores regarding the prevention and control of rabies among 70 high school students. The mean pre-test knowledge score was 7.74 ± 2.98, whereas the mean post-test knowledge score increased to 20.71 ± 3.21. The mean difference between the pre-test and post-test scores was 12.97 ± 4.68.

The calculated paired t-value was 23.18 with 69 degrees of freedom, which was substantially higher than the table value of 1.98. The difference was statistically significant at $p = 0.0001$ ($p < 0.05$). Thus, Table 2 indicates that the Structured Teaching Programme produced a statistically significant improvement in the knowledge of high school students regarding the prevention and control of rabies. Therefore, the educational intervention was found to be effective.

Association of Level of Pre Test Knowledge Score Regarding Prevention and Control of Rabies Among High School Students from Selected Schools in Relation to their Demographic Variable

Overall, the association analysis showed that age, standard of education, and type of family were significantly associated with pre-test knowledge scores regarding the prevention and control of rabies ($p < 0.05$). In contrast, gender, monthly family income, area of residence, father's occupation, mother's occupation, previous knowledge, and source of knowledge were not significantly associated with pre-test knowledge scores ($p > 0.05$). Thus, only selected demographic variables were found to influence baseline knowledge among the high school students.

DISCUSSION

The present study demonstrated a substantial improvement in knowledge regarding the prevention and control of rabies following the Structured Teaching Programme among 70 high school students. At baseline, 58.57% of students had average knowledge, 34.29% had poor knowledge and only 7.14% had good knowledge. Following the intervention, 61.43% achieved very good knowledge, 24.29% had good knowledge and 14.29% attained excellent knowledge. The mean knowledge score increased from 7.74 ± 2.98 in the pre-test to 20.71 ± 3.21 in the post-test, with a mean difference of 12.97 ± 4.68. The improvement was statistically significant

($t = 23.18$, $p = 0.0001$), demonstrating the effectiveness of the Structured Teaching Programme.

These findings are consistent with Hardanahalli et al., who conducted a health education intervention among 121 high school children in Bangalore. The mean knowledge score increased significantly from 12.02 ± 2.16 before health education to 16.94 ± 1.64 after the intervention ($t = 29.301$, $p < 0.001$), supporting the effectiveness of school-based rabies education.[22]

Similarly, Auplish et al. evaluated a rabies education programme among 226 students from seven schools in Sikkim. Post-intervention knowledge scores improved by approximately 19%, while correct understanding of post-exposure precautionary steps showed a marked increase. Their findings also indicated comparable improvement among boys and girls and across urban and rural schools.[23]

Shukla et al. studied 401 adolescents in Lucknow and reported significant improvement in overall knowledge following health-awareness interventions, particularly concerning rabies fatality, wound management and vaccination after animal bites.[23] More recently, Kouser and Akther reported an increase in mean knowledge scores from 11.34 ± 2.93 to 17.02 ± 3.17 among 150 high school students following structured health education ($p < 0.001$).[24] Collectively, these studies strongly support the present findings and demonstrate that structured school-based education can significantly improve rabies-related knowledge among adolescents.

CONCLUSION

The present study concluded that high school students had limited baseline knowledge regarding the prevention and control of rabies, highlighting important gaps in awareness about transmission, preventive measures, wound care, and the need for timely post-exposure management. After administration of the Structured Teaching Programme, a clear improvement was observed in the students' knowledge, indicating that the educational intervention was effective in enhancing their understanding of rabies prevention and control.

The findings further showed that selected demographic characteristics, particularly age, standard of education, and type of family, were associated with baseline knowledge, whereas other variables such as gender, family income, area of residence, parental occupation, previous knowledge, and source of information were not significantly related to knowledge levels. These results suggest that school-based health education can play an important role in addressing knowledge gaps among adolescents.

Overall, the study supports the use of structured teaching as a practical, feasible, and effective educational strategy for promoting rabies awareness among high school students. Incorporating rabies education into school health programmes may help students adopt appropriate preventive practices, seek timely medical care after animal bites, and share correct information with their families and communities. Such initiatives can contribute to strengthening rabies prevention efforts and reducing preventable rabies-related morbidity and mortality.

Conflict of Interest: The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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