



Effectiveness Of a Structured Teaching Programme on Knowledge Regarding First Aid Management of Dog Bite Among Mothers: A Pre-Experimental Study

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ABSTRACT

Background: Dog bites constitute a significant public health problem, particularly among children, and are associated with physical trauma, wound infections, and the risk of fatal rabies transmission. Mothers, as primary caregivers, are pivotal in delivering immediate first aid; however, their knowledge regarding appropriate first aid management of dog bites is often inadequate. Structured teaching programmes (STPs) have demonstrated effectiveness in improving health-related knowledge in community settings. **Objectives:** To assess pre-test knowledge of mothers regarding first aid management of dog bite; to evaluate the effectiveness of an STP by comparing pre- and post-test scores; and to determine the association between pre-test knowledge and selected demographic variables. **Methods:** A pre-experimental one-group pre-test post-test design was employed. Fifty (N=50) mothers of children below 9 years residing in Aliparamba Panchayat Ward-4, Malappuram district, Kerala, were selected by non-probability convenience sampling. Data were collected using a self-developed structured knowledge questionnaire, whose content validity and reliability were established before data collection. A 30-minute STP incorporating pamphlets and demonstrations was delivered. Reliability and content validity were established through expert review and a pilot study. Descriptive statistics, paired t-test, and chi-square test were used for analysis. **Results:** Pre-test assessment revealed that 12% of mothers had poor knowledge, 78% had average knowledge, and 10% had good knowledge (mean 8.84, SD 2.38). Post-test findings showed a marked improvement: 76% of mothers achieved good knowledge and 24% average knowledge, with none remaining in the poor category (mean 15.72, SD 1.08). The mean difference was 6.88. The paired t-test yielded $t(49)=19.47$ ($p<0.001$), confirming statistically significant improvement. Chi-square analysis found no significant association between pre-test knowledge scores and demographic variables ($p>0.05$). **Conclusion:** The STP significantly improved mothers' knowledge regarding first aid management of dog bites. Community-based educational interventions are recommended to empower caregivers, reduce complications, and mitigate rabies-related morbidity and mortality.

Keywords: structured teaching programme; dog bite; first aid; knowledge; pre-experimental study; rabies prevention; community health education

INTRODUCTION

Dog bites are a global public health concern, accounting for an estimated 4.5 million bites annually in the United States alone and tens of millions worldwide [1]. In India, dogs are responsible for approximately 96% of all animal bite-related rabies deaths, and the country bears one of the highest burdens of human rabies globally, with tens of thousands of exposures reported annually [2,4]. Children below the age of nine years are disproportionately affected owing to their limited risk perception, smaller physical stature, and tendency to interact closely with animals [6,7].

Rabies is an acute viral zoonosis caused by the neurotropic Lyssavirus and is virtually 100% fatal once clinical symptoms appear; however, the disease is entirely preventable through timely post-exposure prophylaxis (PEP) and appropriate wound management [1,2]. Immediate first aid through thorough washing of the wound with soap and water for a minimum of 15 minutes, followed by prompt medical assessment and PEP is the cornerstone of rabies prevention after an animal bite [1,2]. Despite this, a substantial proportion of caregivers lack adequate knowledge of correct first aid procedures, resulting in delayed or inappropriate management [5,9].

Mothers constitute the primary caregiving unit for young children in most Indian communities and are therefore best positioned to administer immediate first aid following a dog bite. Studies conducted across South Asia have reported that knowledge deficits among mothers regarding wound care, anti-rabies vaccination, and PEP remain prevalent, particularly in rural and semi-urban settings [5,9]. Structured teaching programmes (STPs) systematic, planned educational interventions delivered using a combination of lectures, demonstrations, and printed materials have been shown to effectively bridge these knowledge gaps in community health education [10,11].

Despite growing evidence supporting STP-based health education, few studies have specifically evaluated STP effectiveness for first aid management of dog bites in the Indian community setting. The present study was therefore undertaken to evaluate the effectiveness of an STP on knowledge regarding first aid management of dog bite among mothers of young children in Malappuram district, Kerala.

Objectives

1. To assess the pre-test knowledge level of mothers regarding first aid management of dog bite as measured by a structured

knowledge questionnaire. 2. To evaluate the effectiveness of the structured teaching programme by comparing pre-test and post-test knowledge scores. 3. To determine the association between pre-test knowledge scores and selected demographic variables.

MATERIALS AND METHODS

Research Design

A pre-experimental one-group pre-test post-test design was adopted for this study.

Study Setting and Sample

The study was conducted in Aliparamba Panchayat Ward-4, Malappuram district, Kerala, India. The target population comprised mothers of children below 9 years of age residing in the ward. A sample of 50 mothers (N=50) was selected using non-probability convenience sampling. Mothers who were available and willing to participate were included; those who had previously attended a formal health education session on dog bite management were excluded.

Study Tool

Data were collected using a self-developed, structured knowledge questionnaire comprising 20 items pertaining to first aid management of dog bite, including wound care, rabies transmission, and post-exposure prophylaxis. Each correct response was awarded one mark (maximum score: 20). Knowledge was categorized as follows:

- Poor: scores 1–6
- Average: scores 7–14
- Good: scores 15–20

Validity and Reliability

Content validity was established by a panel of seven subject matter experts drawn from nursing, community medicine, and public health. Reliability was assessed through a pilot study on a comparable group of ten mothers; the split-half reliability coefficient was found to be satisfactory.

Data Collection Procedure

Following institutional approval and written informed consent, a pre-test was administered to all participants using the structured knowledge questionnaire. The STP was then delivered as a 30-minute interactive session incorporating a lecture, PowerPoint presentation, illustrated pamphlets, and a demonstration of wound-washing technique. A post-test using the same questionnaire was administered immediately after the intervention to evaluate knowledge gain.

Statistical Analysis

Data were analysed using SPSS version 26.0. Descriptive statistics (frequency, percentage, mean, and standard deviation) summarised the demographic profile and knowledge scores. The paired t-test was used to compare pre-test and post-test mean scores and to assess the effectiveness of the STP. Chi-square test was applied to examine the association between pre-test knowledge scores and selected demographic variables. A p-value of <0.05 was considered statistically significant.

Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee of Al Shifa College of Nursing, Perinthalmanna. Written informed consent was obtained from all participants prior to data collection. Participation was voluntary, and confidentiality of the data was maintained throughout.

RESULTS

Section I: Demographic Profile of Participants

Table 1 presents the distribution of the 50 participating mothers according to selected demographic variables. The majority (56%) had secondary-level education, and 74% were homemakers. Most mothers (88%) reported no prior history of dog bite in the family, and 76% did not own a pet dog. Among the 12 mothers who owned dogs, 67% reported that their pets were vaccinated.

Table 1. Distribution of Participants According to Demographic Variables (N=50)

Variable	Category	Frequency (n)	Percentage (%)
Educational status	Primary	1	2%
	Secondary	28	56%
	Higher secondary	15	30%
	Diploma/Grad/PG	6	12%
Occupational status	Medical field	2	4%
	Homemaker	37	74%
	Other	11	22%
Dog bite history in family	Yes	6	12%
	No	44	88%
Pet dog at home	Yes	12	24%
	No	38	76%
Pet dog vaccinated	Yes	8	67%*
	No	4	33%*

*Percentage calculated among the 12 mothers who owned a pet dog.

Section II: Pre-Test Knowledge Levels

Table 2 summarises the distribution of pre-test knowledge scores. The majority of mothers (78%, n=39) demonstrated

average knowledge. Only 10% (n=5) achieved a good knowledge score at baseline, while 12% (n=6) were categorised in the poor knowledge range. The overall pre-test mean score was 8.84 (SD=2.38).

Table 2. Distribution of Participants According to Pre-Test Knowledge Level (N=50)

Knowledge Level	Frequency (n)	Percentage (%)	Mean Score	SD
Poor (1–6)	6	12%	8.84	2.38
Average (7–14)	39	78%		
Good (15–20)	5	10%		
Total	50	100%		

Section III: Post-Test Knowledge Levels

Table 3 presents the post-test knowledge distribution following the STP. A striking improvement was observed: 76% (n=38) of mothers achieved good knowledge, and the

remaining 24% (n=12) attained average knowledge. No participant remained in the poor knowledge category after the intervention. The post-test mean score was 15.72 (SD=1.08).

Table 3. Distribution of Participants According to Post-Test Knowledge Level (N=50)

Knowledge Level	Frequency (n)	Percentage (%)	Mean Score	SD
Poor (1–6)	0	0%	15.72	1.08
Average (7–14)	12	24%		
Good (15–20)	38	76%		
Total	50	100%		

Section IV: Effectiveness of the Structured Teaching Programme

Table 4 compares the pre- and post-test knowledge scores. The mean post-test score (15.72±1.08) was substantially higher

than the mean pre-test score (8.84±2.38), reflecting a mean difference of 6.88. The paired t-test yielded t(49)=19.47, which was highly statistically significant (p<0.001), confirming the effectiveness of the STP in improving mothers' knowledge regarding first aid management of dog bite.

Table 4. Comparison of Pre-Test and Post-Test Knowledge Scores (N=50)

Parameter	Pre-Test	Post-Test	Mean Difference	t-value	p-value
Mean Score	8.84	15.72	6.88	19.47	<0.001
SD	2.38	1.08			

Paired t-test, df=49; p<0.001 indicates statistical significance at the 0.05 level.

Section V: Association Between Knowledge and Demographic Variables

Chi-square tests were applied to determine whether pre-test knowledge scores were significantly associated with selected demographic variables (Table 5). None of the demographic

variables, educational status, occupational status, history of dog bite in the family, pet dog ownership, or pet vaccination status demonstrated a statistically significant association with pre-test knowledge scores at the 0.05 significance level. These findings suggest that the baseline knowledge deficit was broadly distributed across all demographic subgroups, reinforcing the universal need for educational interventions.

Table 5. Association Between Pre-Test Knowledge Scores and Demographic Variables (N=50)

Demographic Variable	Chi-Square (χ²)	df	p-value
Educational status	5.64	6	0.175
Occupational status	8.32	4	0.080
History of dog bite (family)	0.304	1	0.581
Pet dog at home	0.83	1	0.362
Pet dog vaccinated	2.00	1	0.157

p-value >0.05 indicates no statistically significant association.

DISCUSSION

The present study evaluated the effectiveness of a structured teaching programme on the knowledge of mothers regarding first aid management of dog bite. The results demonstrated that, at baseline, the majority of participants had only average knowledge (78%), with a small proportion exhibiting good knowledge (10%). This finding is consistent with broader

epidemiological evidence from India documenting widespread knowledge deficits regarding dog bite management and rabies prevention among community members [4,5,7].

Following the STP, a statistically significant improvement in knowledge was observed (t=19.47, p<0.001), with 76% of participants attaining good knowledge and the proportion with poor knowledge reducing to zero. This magnitude of

improvement aligns closely with findings from similar STP-based interventions conducted in nursing and community health contexts in India. Satly Shaju et al. (2022) likewise reported significant post-intervention knowledge improvement among community participants following an STP on first aid management of dog bite [9]. Comparable gains have been documented for STPs targeting diverse health topics, including child abuse prevention and breast engorgement management, reinforcing the generalisability of this pedagogical approach [10,11].

The post-test mean score of 15.72 (SD=1.08) represents an increase of 6.88 points over the pre-test mean of 8.84 (SD=2.38), reflecting a percentage improvement of approximately 78%. The narrow standard deviation in the post-test scores suggests a homogenising effect of the STP, whereby most participants converged toward a uniformly high level of knowledge. The 30-minute STP, which integrated a structured lecture, illustrated pamphlets, and wound-washing demonstration, appears to have been well-suited to the needs of this community-based sample and consistent with adult learning principles.

Chi-square analysis revealed no statistically significant association between pre-test knowledge and any of the selected demographic variables, including educational status, occupational status, history of dog bite in the family, pet ownership, or pet vaccination status. This finding suggests that knowledge deficits regarding dog bite first aid are pervasive irrespective of sociodemographic background, a finding corroborated by Shukla and Ahmad (2017) who reported similarly widespread knowledge gaps among community members in Madhya Pradesh [8]. The universal nature of this deficit further strengthens the rationale for community-wide STPs rather than targeted interventions for specific subgroups.

The epidemiological relevance of improving maternal first aid knowledge in India cannot be overstated. India accounts for approximately 36% of global human rabies deaths annually, and dog bites the predominant route of transmission affect millions of individuals each year, with children representing the highest-risk demographic [2,4]. John et al. (2021) estimated the combined epidemiological, humanistic, and economic burden of dog-mediated rabies in India to be substantial, with significant years of life lost and direct medical costs [3]. Community-based interventions targeting maternal knowledge offer a low-cost, scalable strategy to reduce preventable morbidity and mortality.

Several limitations of this study should be acknowledged. The pre-experimental design, which lacks a control group and randomisation, limits causal inference regarding the STP's exclusive effect on knowledge gain. Convenience sampling restricts the generalisability of findings beyond the study ward. The use of a self-developed questionnaire, while validated, has not been tested for cross-cultural equivalence. Furthermore, only immediate post-test scores were assessed; long-term knowledge retention and its translation into practice were not evaluated. Future studies employing randomised controlled designs and longitudinal follow-up are recommended to address these limitations.

CONCLUSION

The structured teaching programme was effective in significantly enhancing the knowledge of mothers regarding first aid management of dog bite. The highly significant improvement in knowledge scores ($t=19.47$, $p<0.001$) underscores the value of well-planned, interactive community health education in addressing critical knowledge gaps. Given India's high burden of dog bite-related injuries and rabies, community-based STPs targeting primary caregivers particularly mothers of young children represent an important public health strategy to reduce complications, promote timely medical care-seeking, and ultimately decrease rabies-related morbidity and mortality.

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Conflicts of Interest: The authors declare no conflicts of interest.

Ethical Approval: Granted by the Institutional Ethics Committee of Al Shifa College of Nursing, Perinthalmanna, Kerala.

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