

EVALUATION OF COMMUNITY PHARMACIST'S KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING RABIES PREVENTION AND CONTROL: A CROSS SECTIONAL STUDY

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Article Received on 04 Feb. 2026,
Article Revised on 23 Feb. 2026,
Article Published on 01 March 2026,

<https://doi.org/10.5281/zenodo.18802914>

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How to cite this Article: ¹*Mrs. B. Nivetha, ²Dr. R. Manivannan, ³Jayakumar T., ³Jeevitha A., ³Kirthika M., ³Vetrivel R. (2026). Evaluation of Community Pharmacist's Knowledge, Attitude And Practice Regarding Rabies Prevention and Control: A Cross Sectional Study. World Journal of Pharmaceutical Research, 15(5), 903-915

ABSTRACT

Rabies is a fatal but completely preventable zoonotic disease that continues to pose a significant public health challenge in endemic regions. Community pharmacists, being highly accessible healthcare professionals, are strategically placed to make a significant contribution to rabies prevention through patient education, early counselling, and appropriate referral for post-exposure prophylaxis (PEP). This study aimed to determine the knowledge, attitudes, and practices (KAP) of community pharmacists regarding rabies prevention and management. An observational cross-sectional KAP study was conducted among registered community pharmacists practicing in selected districts of Salem, Namakkal & Erode of Tamil Nadu from Oct 2025 to Jan 2026. Data were collected using a structured, pretested questionnaire distributed with the aid of Google Forms. The questionnaire assessed sociodemographic

characteristics, knowledge of rabies transmission, vaccination schedules, attitudes toward prevention and public health responsibility, and current practice patterns in managing animal bite cases. Data were analysed using descriptive statistics, including frequencies and percentages, and associations were evaluated using appropriate statistical tests. The study concluded that community pharmacists had moderate knowledge of rabies transmission,

wound care, and PEP, with generally positive attitudes toward prevention and professional responsibility. However, gaps were noted in practice, particularly in patient counselling, referral practices, and awareness of immunoglobulin use. KAP scores varied with education and experience. Overall, while awareness and attitudes are encouraging, structured continuing education and targeted training are needed to strengthen pharmacists' role in rabies control and support national elimination goals.

KEYWORDS: Rabies, Communicable disease, Pharmacist.

INTRODUCTION

Rabies, a fatal zoonotic disease caused by a neurotropic virus, continues to pose a significant global public health threat, particularly in endemic regions where canine rabies is prevalent.^[1] With over 59,000 human deaths annually, primarily concentrated in Asia and Africa, the disease burden is substantial, making it a critical area for public health intervention.^[1] Despite the availability of effective vaccines and post-exposure prophylaxis, rabies remains 100% fatal once clinical symptoms manifest, underscoring the imperative for robust prevention strategies and enhanced public awareness.^[1,2]

For instance, 40% of rabies exposures globally involve children under 15, highlighting a vulnerable population that often lacks adequate awareness.^[3] Consequently, proactive measures focused on community education and accessibility to preventive care are paramount to mitigate the disease's devastating impact.^[4] The global initiative "Zero by 30" aims to eliminate dog-mediated human rabies deaths by 2030, emphasizing dog vaccination coverage, public awareness, and ensuring timely access to medical interventions.^[5]

Achieving this ambitious goal necessitates a multifaceted approach that encompasses widespread community education and robust healthcare infrastructure, particularly given that public awareness significantly contributes to prevention.^[6] Given that rabies remains a largely neglected viral zoonotic disease, particularly in resource-limited settings, understanding the existing knowledge, attitudes, and practices of various healthcare professionals, including community pharmacists, becomes crucial for effective prevention and control efforts.^[7] Pharmacists, as readily accessible healthcare professionals, are strategically positioned to disseminate crucial information, influence public perception, and facilitate early intervention against rabies, yet their specific roles and levels of understanding regarding this disease are often underexplored.^[8]

This study therefore aims to assess the knowledge, attitudes, and practices of community pharmacists concerning rabies prevention and management, identifying potential gaps and opportunities for targeted educational interventions.

Recognizing the significant public health burden of rabies, with an estimated 3.74 million disability-adjusted life years lost annually, and the substantial economic impact of post-exposure prophylaxis which can be as high as USD 108 per person, this research seeks to elucidate how community pharmacists can be better integrated into national rabies control programs.^[8,9] This investigation will thereby contribute to the broader understanding of healthcare professional roles in zoonotic disease control and inform strategies for optimizing community-level public health initiatives.^[10,11]

Concerning the consistent availability of anti-rabies vaccines at various healthcare levels Specifically, while initiatives like the National Rabies Control Program in India strive to achieve the WHO target of global elimination of human deaths from dog-mediated rabies by 2030 through comprehensive strategies including vaccination and awareness campaigns, significant challenges persist, particularly and the need for enhanced healthcare professional training.^[1,12] These persistent gaps underscore the critical need for a deeper understanding of the contributions of all healthcare professionals, including community pharmacists, in mitigating the disease's burden, especially in regions like Southeast Asia where rabies remains endemic.^[13] Further exploration into the specific knowledge, attitudes, and practices of community pharmacists is crucial to identify tailored interventions that leverage their accessibility and enhance their contributions to rabies prevention and control efforts.^[1,8]

This assessment is particularly vital given that inappropriate administration of post-exposure prophylaxis occurs in over 40% of cases, highlighting a critical need for enhanced understanding among healthcare providers.^[3] Such inaccuracies often stem from insufficient knowledge regarding the appropriate protocols for wound washing, vaccine administration, and the judicious use of rabies immunoglobulin, all of which are critical components of timely and effective post-exposure prophylaxis.^[14,15]

These deficiencies underscore the imperative for comprehensive educational programs targeting healthcare professionals, including community pharmacists, to ensure adherence to best practices in rabies management and ultimately reduce preventable deaths.^[16] This study, therefore, aims to thoroughly assess the current knowledge, attitudes, and practices of

community pharmacists regarding rabies prevention and management, thereby identifying critical areas for educational intervention and policy development.

AIM AND OBJECTIVE

Aim

To assess the knowledge, attitude, and practices (KAP) regarding rabies prevention among community pharmacists.

OBJECTIVES

1. To evaluate the level of knowledge of community pharmacists on rabies transmission, prevention, and post-exposure prophylaxis.
2. To assess the attitudes of community pharmacists toward rabies prevention and public health responsibilities.
3. To analyze current practices of community pharmacists in managing animal bite cases and providing rabies-related counselling.

METHODOLOGY

Study Design

An Observational, Cross-sectional – Knowledge, Attitude, and Practice (KAP) study was conducted to assess rabies prevention-related awareness and practices among community pharmacists.

Study Setting

The study was carried out in community (retail) pharmacies located in the Districts of Erode, Namakkal, Salem during the study period of Oct-25 to Jan-26. Both urban and rural community pharmacies were included in this study.

Inclusion Criteria

- Registered pharmacists with a valid State Pharmacy Council registration
- Pharmacists currently practicing in community or retail pharmacies
- Pharmacists who consented to participate in the study

Exclusion Criteria

- Pharmacists working exclusively in hospital, industrial, or academic settings
- Pharmacy assistants or unregistered personnel
- Pharmacists unwilling to participate or unavailable during data collection

Sample Size and Sampling Technique

A Convenience sampling technique was employed to select community pharmacists from the study around places of Salem and Erode.

Study Tool

Data were collected using a predesigned, pretested, structured questionnaire developed after an extensive literature review. The questionnaire consisted of four sections:

- Sociodemographic details
- Knowledge related to rabies transmission, prevention, vaccination schedules, and post-exposure prophylaxis
- Attitude toward rabies prevention, counselling responsibilities, and public health involvement
- Practice related to animal bite management, patient counselling, and referral practices

Data Collection Procedure

Data were collected using a self-administered questionnaire distributed through Google Forms.

Data Analysis

Collected data were entered into Microsoft Excel and analyzed using statistical software (e.g., SPSS). Descriptive statistics such as frequency, percentage, mean, and standard deviation were used. Associations between KAP scores and demographic variables were assessed using appropriate statistical tests.

RESULT AND DISCUSSION

Demographic Characteristics of Participants

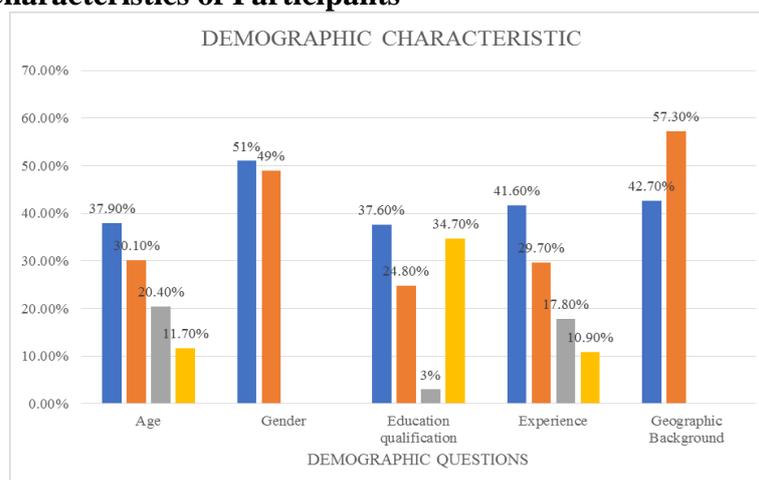


Figure No. 01: Demographic Characteristics of Participants.

The demographic findings provide important insights into the characteristics of the study population and their potential influence on the study outcomes.

The predominance of young adults (37.9%) and early-career professionals (41.6%) indicates that the study reflects the perspectives of individuals who are in the early and active phase of their professional practice. These participants are generally more adaptable, updated with current treatment guidelines, and receptive to clinical interventions such as medication therapy management and rational prescribing practices.

The balanced gender distribution (51% male and 49% female) enhances the generalizability of the findings, suggesting that the results are not skewed toward a particular gender. This balance is particularly relevant in healthcare research, where gender may influence knowledge, attitude, and practice patterns.

The educational profile demonstrates that the majority of respondents were well-qualified (over 70% holding undergraduate or postgraduate degrees). This indicates that participants had adequate academic exposure to pharmacotherapy, clinical pharmacy, and patient care practices, thereby supporting the reliability of their responses in areas such as prescribing patterns, patient counselling, and rational drug use.

The experience distribution reveals that most participants had limited to moderate experience, which may influence prescribing behavior and clinical decision-making. Early-career professionals may rely more on standard treatment guidelines and protocols, while highly experienced professionals may use clinical judgment and past experience. The relatively lower proportion of highly experienced respondents (10.9%) suggests that the findings may be more reflective of guideline-based practice rather than experience-based deviations.

The urban dominance (57.3%) among respondents suggests better exposure to healthcare facilities, continuing professional education programs, and updated treatment protocols. However, the substantial proportion of rural participants (42.7%) ensures representation of healthcare settings where resource limitations and accessibility challenges may influence prescribing patterns and patient care practices.

Overall, the demographic characteristics indicate that the study population is young, educated, moderately experienced, and fairly gender-balanced, with representation from both urban and rural settings. These characteristics support the validity, reliability, and

generalizability of the study findings while also highlighting the need for targeted interventions such as continuous professional education, rational prescribing training, and community-based awareness programs to improve healthcare outcomes.

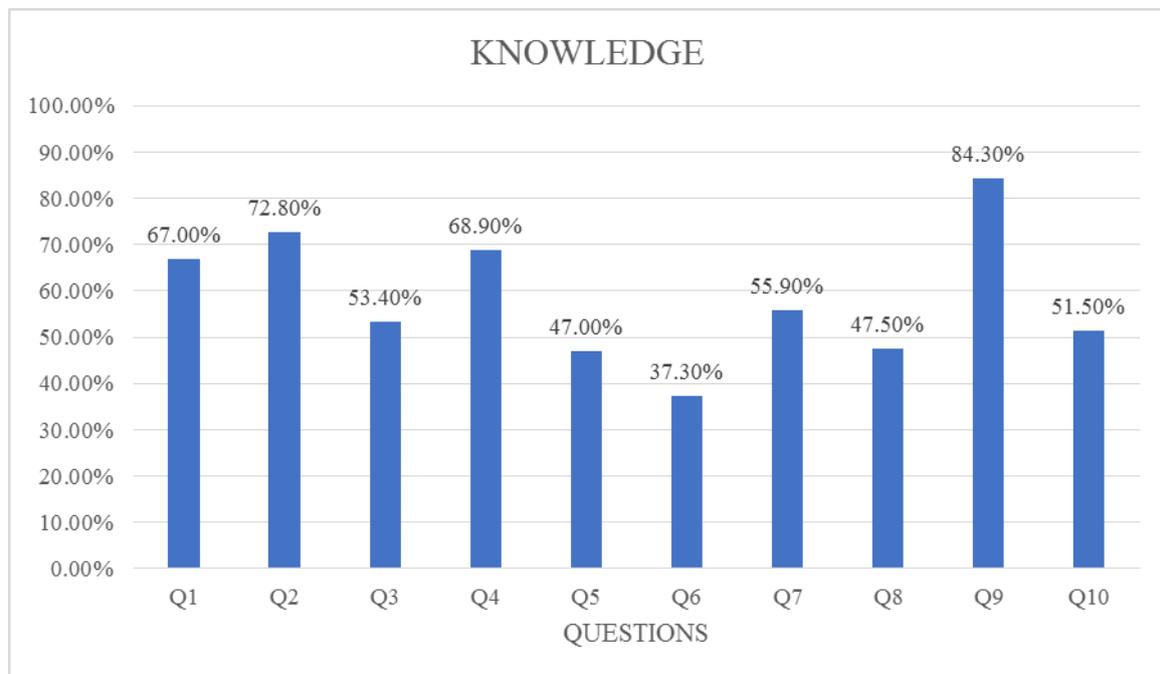


Figure No. 02: No of responses regarding knowledge about rabies prevention among participant.

The present study demonstrates that community pharmacist possess moderate to good overall knowledge regarding rabies prevention but there are significant gaps in critical and vaccine related areas.

The high level of awareness regarding the cause (67%) and transmission (72.8%) of rabies is encouraging and aligns with the essential knowledge expected from frontline healthcare providers. These findings suggest that pharmacists are generally aware of the fundamental nature of rabies as a viral zoonotic disease transmitted through animal bites, which is crucial for early risk identification.

However, knowledge related to clinical features (53.4%) and early symptoms was only moderate. This is concerning because early recognition of symptoms such as tingling at the bite site and fever is vital for prompt referral and management. Insufficient awareness in this area may delay timely intervention.

Encouragingly, knowledge regarding post-exposure prevention (68.9%) was relatively high,

indicating that most pharmacists understand that rabies is preventable if appropriate measures are taken immediately. However, less than half (47%) correctly identified the vaccination schedule, which is a significant gap. Incomplete knowledge of immunization schedules can lead to inadequate patient counselling and improper vaccine use.

The lowest knowledge score (37.3%) was observed in identifying available rabies vaccines (cell culture vaccines). This finding highlights a critical gap in pharmacists' knowledge about vaccine types, storage, and dispensing, which is directly relevant to their professional role in community pharmacy practice. Knowledge regarding pre- and post-exposure prophylaxis (55.9%) and wound care practices (47.5%) was also suboptimal. Since pharmacists are often the first point of contact for bite victims, lack of knowledge in wound care can adversely affect patient outcomes.

The high awareness regarding rabies epidemiology (84.3%), particularly identifying dogs as the primary source, indicates strong community-level awareness and aligns with national epidemiological trends in India. Awareness that rabies is a notifiable disease (51.5%) was only moderate, suggesting a need for improved understanding of public health responsibilities and reporting systems among pharmacists.

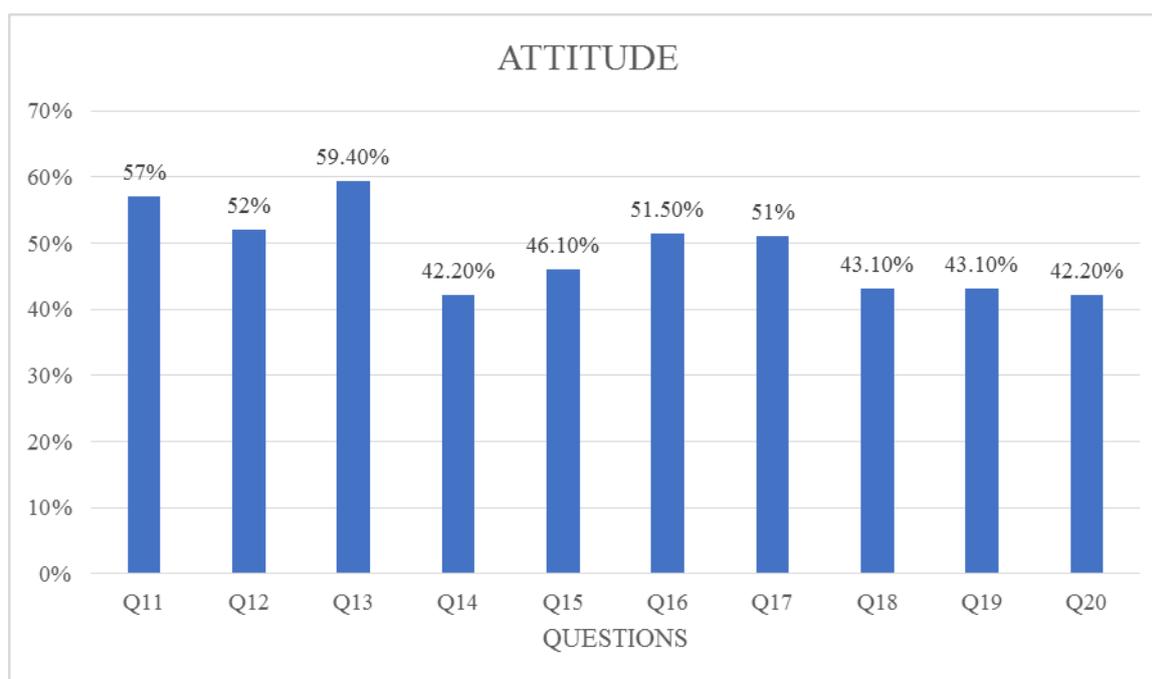


Figure No: 03- No of responses regarding Attitude about rabies prevention among participant.

The attitude findings of the present study reveal that community pharmacists demonstrate a highly positive and proactive attitude toward rabies prevention and control. The strong agreement that pharmacists play an important role in rabies control reflects an evolving perception of pharmacists as public health professionals, rather than merely dispensers of medicines. This aligns with modern pharmacy practice models that emphasize patient-centered care and community engagement.

The positive attitude toward public education and counselling is particularly encouraging. Since pharmacists are often the first point of healthcare contact, their willingness to educate patients about post-exposure prophylaxis, vaccination, and wound care can significantly reduce delays in treatment and improve patient outcomes. The high level of agreement regarding vaccine accessibility and affordability reflects pharmacists' understanding of health equity and access issues, especially in developing countries where rabies remains endemic. Making vaccines available at community pharmacies can improve timely access, particularly in rural and underserved areas.

The finding that most pharmacists recognize rabies as a public health priority indicates awareness of the disease burden and mortality risk associated with rabies. This awareness is critical for ensuring active participation in awareness campaigns and preventive interventions.

Importantly, the positive attitude toward interprofessional collaboration with veterinarians and public health authorities highlights the pharmacists' readiness to participate in multidisciplinary disease control programs. This supports the global One Health strategy, which is essential for rabies elimination. Although the overall attitude was highly positive, translating these attitudes into consistent practice behaviors requires strengthening training, providing resources, and integrating pharmacists into national rabies control programs.

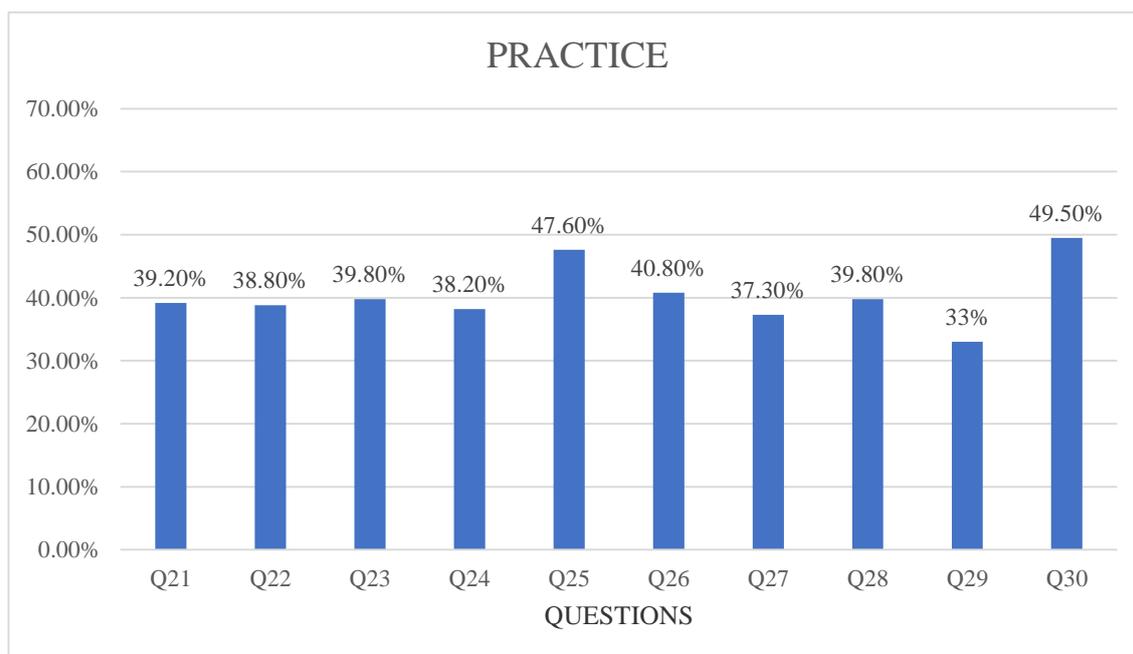


Figure No: 04- No of responses regarding Practice about rabies prevention among participant.

The practice findings of the present study indicate that community pharmacists demonstrate generally appropriate and proactive practices toward rabies prevention and management. The high proportion of pharmacists involved in patient counselling and wound-care advice highlights their important role as first-contact healthcare professionals. Immediate wound cleaning and early referral are crucial steps in rabies prevention, and the pharmacists' involvement in these activities significantly contributes to reducing disease risk.

The finding that many pharmacists stock and dispense anti-rabies vaccines demonstrates that community pharmacies serve as accessible immunization centers, particularly in settings where hospital access may be limited. This supports the expansion of pharmacy-based vaccination services as part of public health strategies.

Proper cold-chain maintenance practices observed among pharmacists indicate good adherence to vaccine storage standards, ensuring the safety and efficacy of administered vaccines. The strong referral practices observed in this study reflect appropriate professional judgment and recognition of the severity of rabies exposure, which requires immediate medical attention and post-exposure prophylaxis.

Although pharmacists reported participation in community awareness programs, the level of

involvement in organized rabies campaigns appears relatively limited. This suggests the need for greater inclusion of pharmacists in national and regional rabies control initiatives. The study also identified gaps in documentation and record-keeping practices, which are essential for tracking vaccination coverage, follow-up doses, and surveillance of rabies cases. Strengthening documentation systems will improve continuity of care and public health reporting.

Encouragingly, pharmacists also reported educating pet owners regarding animal vaccination, which aligns with the One Health strategy for rabies elimination. This practice is critical because controlling rabies in animal reservoirs, especially dogs, is key to preventing human infections.

CONCLUSION

This study assessed the knowledge, attitude, and practice of community pharmacists regarding rabies prevention and control. The findings indicate that pharmacists possess moderate to good knowledge, particularly about the cause, transmission, and prevention of rabies, though gaps exist in vaccine schedules, wound management, and reporting systems. The attitude of pharmacists was highly positive, with strong agreement on their role in patient counselling, vaccination awareness, and public health responsibility. The practice component showed good involvement in counselling bite victims, providing wound-care advice, dispensing vaccines, and referring cases, although participation in awareness programs and documentation practices needs improvement.

Overall, community pharmacists are well-positioned to contribute significantly to rabies prevention and control. Strengthening their knowledge through training and integrating them into public health programs will enhance their role in reducing rabies incidence and improving community health outcomes.

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