

## Assessment of Community Knowledge on Rabies Prevention and Wound Care After Dog Bites in a Tertiary Care Hospital of Karachi

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### ABSTRACT

**Background:** Rabies is a preventable but fatal zoonotic disease. Dogs are responsible for almost all human rabies deaths worldwide. In Pakistan, tens of thousands of dog bites are reported annually, but public awareness of proper wound management and timely vaccination remains suboptimal.

**Objective:** To evaluate the general public's awareness of first-aid wound management and the fatality of rabies at a large tertiary care hospital in Karachi.

**Methods:** A descriptive cross-sectional study was conducted in the outpatient department of tertiary care hospital Karachi, using a convenience sample of 275 non-healthcare participants. A self-structured questionnaire assessed socio-demographics, awareness of rabies, and knowledge of first-aid wound management. Data were analyzed using SPSS version 2021, applying descriptive statistics and chi-square tests.

**Results:** Most respondents were aware of rabies' fatality and stated they would wash bite wounds with soap and running water. However, a considerable proportion reported applying herbal remedies or thought immediate suturing was necessary. Awareness of anti-rabies vaccination was high but inconsistent with reported practices.

**Conclusion:** Although awareness has improved since earlier surveys at ASH, misconceptions persist. Targeted health education and locally relevant information, education, and communication (IEC) campaigns are urgently needed to strengthen correct first-aid practices and promote timely vaccination.

**Keywords:** Rabies prevention, wound care, dog bites, community knowledge, Karachi

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## 1. INTRODUCTION

Rabies is an acute, progressive, and almost invariably fatal viral encephalitis caused by a single-stranded RNA virus of the *Rhabdoviridae* family (Parija, 2023; Hassaan, Firoze, Raza, Sami, & Ahmad, 2023; Moore & McVey, 2022; Hooper, 2024; Nayak et al., 2022). The disease is characterized by a short prodromal phase, often presenting with non-specific symptoms such as fever, malaise, headache, and sore throat, followed by severe neurological manifestations, including hydrophobia, paralysis, and coma, ultimately leading to death in the absence of timely intervention (Boushab, Benane, Ould Baba, & Basco, 2022; Gajurel et al., 2022; Singhai et al., 2022). Transmission occurs primarily through the bite of infected mammals, with dogs responsible for up to 99% of human rabies deaths worldwide, underscoring the zoonotic importance of dog-mediated rabies in global health (Fehlner-Gardiner et al., 2024; Akinsulie et al., 2024; Rather & Vasavi, 2024) (World Health Organization [WHO], 2021). Following inoculation, the virus spreads centripetally along peripheral nerves to the central nervous system, causing irreversible neurological damage.

Rabies has been routinely cause of a disproportionate burden on the public health and economy, although it can be prevented in all cases and is not a myth (Tidman et al., 2022; Swedberg et al., 2024). The disease is estimated to cost USD 8.6 billion/year in the world and cause nearly 59,000 human fatalities every year, with much of the expense due to loss of productivity, premature deaths, and post-exposure prophylaxis (Centers for Disease Control and Prevention [CDC]. The burden falls to low- and middle-income countries (LMICs) especially in Asia and Africa, with poor surveillance, insufficient health infrastructure, and access to PEP (Swedberg et al., 2023; Rupprecht, Mshelbwala, Reeves, and Kuzmin, 2023). The awareness gap among the population was deep as a cross-sectional study conducted in Nigeria showed that only 38 percent of participants have heard about rabies, and only 13 percent would name at least two ways of its prevention.

The South Asian area is another rabies hot spot with close to 45 percent of the death of rabies being addressed in South Asia (Zhang et al., 2023). In Bangladesh, I have found that the number of reported dog-bite cases observed each year is about 300,000, which is a reminder of the current dog population control problem and the lack of vaccines (Ghosh et al., 2024). Community-level awareness in India is still low; a survey conducted in 2019 indicated that only 22.9% of the people studied perceived the practice of washing animal-bite wounds with soap and water as first-aid treatment to be important (Patel et al., 2024). This ignorance about the fundamental preventive knowledge also conducts disease transmission, and postpones life-saving measures.

Rabies remains a serious and unsolved health issue in Pakistan (Kumar and Bakhru, 2022; Jabbar et al., 2024; Salahuddin et al., 2023). The reported cases of dogs bites are more than 50,000, and rabies-associated deaths are about 6,000 per year which indicate a grave lapse in preventive measures. The results of the knowledge, attitudes, and practices (KAP) survey conducted in the restoration of Khyber Pakhtunkhwa and Punjab provinces reported that although seventy-two point four percent of the population recognized rabies as the universal killer animal, forty percent stated that they would consult medical suppliers once bitten by a dog, and just twenty-five percent stated they had ever encountered rabies awareness or vaccination training (Ahmad et al., 2024). This awareness to health-seeking behavior gap is a testament to the effect of an immediate need to have sustained community engagement..

Sindh province, in particular, has reported alarmingly high incidence rates, with approximately 150,000 dog-bite cases documented in 2021 alone. Despite these figures, systematic studies on public knowledge and attitudes toward rabies in Sindh remain scarce. Earlier evidence from Karachi revealed that as many as 91% of dog-bite victims were unaware that rabies could result from an untreated dog bite, underscoring persistent knowledge deficits at the community level. In the absence of structured awareness campaigns, the cycle of underreporting, inadequate wound management, and delayed or absent access to PEP continues to perpetuate mortality.

Given these realities, there is a pressing need to reassess the state of public awareness regarding rabies in Sindh, particularly in urban tertiary care settings where dog-bite victims frequently present. This study was undertaken at Abbasi Shaheed Hospital (ASH), Karachi, in 2022, with the aim of evaluating the knowledge, attitudes, and practices of dog-bite victims toward rabies prevention and first-aid wound management. By identifying prevailing gaps, the findings seek to inform targeted educational interventions, strengthen awareness campaigns, and contribute to broader rabies elimination strategies aligned with the global goal of ending dog-mediated human rabies by 2030.

## 2. OBJECTIVES

To evaluate the general public's knowledge and awareness of first-aid wound management of rabies at a tertiary care hospital in Karachi.

## 3. METHODOLOGY

This descriptive cross-sectional study was conducted in the outpatient Department of tertiary care Hospital, Karachi for a period of 6 months from January 2024 to June 2024. The study population comprised non-healthcare individuals, including patients and attendants, visiting the hospital during the study period. Healthcare professionals were excluded to focus on

public awareness.

A convenience sampling technique was used to recruit participants. Based on a 95% confidence level and a 5% margin of error, the minimum required sample size was calculated as 275 using the Openepi sample size calculator. Individuals younger than 15 years, mentally disabled persons, non-consenting individuals, severely ill patients, and those unable to communicate in Urdu or English were excluded.

Data were collected using a self-structured questionnaire containing 21 items divided into three sections. The first section sought demographic information and informed consent. The second section assessed awareness of rabies, including its fatality, symptoms, and preventive measures. The third section explored knowledge and intended practices regarding first-aid wound management after a dog bite. To ensure comprehension, the questionnaire was translated into Urdu and administered as one-on-one interviews by trained data collectors.

All participants provided informed consent before enrollment. Data were coded and entered into SPSS version 2021 for analysis. Descriptive statistics such as frequencies and percentages were generated, and chi-square tests were applied to assess associations between demographic variables and awareness indicators. Confidentiality was maintained throughout the study.

#### 4. RESULTS

A total of **275 respondents** from the outpatient department of tertiary care hospitals of Karachi participated in the study. The majority were adults aged 18 years and above; **63.26** were men and **36.74%** were women. Almost all respondents (95.3%) had heard of rabies and 90.9% recognized it as a fatal disease. More than nine out of ten (92.7%) knew that rabies is transmitted by dog bites, while 69.1% were aware that Pakistan has a high incidence of rabies. Awareness that rabies can be prevented by timely administration of vaccine was 87.3%, whereas only 14.5% believed rabies is curable, 69.1% said it is not curable and 16.4% were unsure. About 10.9% mistakenly thought they could still develop rabies even if vaccinated preventively.

Regarding immediate wound care after a dog bite, 83.6% reported they would rush to the nearest hospital and 72.7% said they would wash the wound with soap and running water, whereas 20.0% stated they would apply herbal or home remedies such as turmeric or chilli powder. Smaller proportions indicated they would dress the wound immediately (32.7%) or suture the wound (12.7%).

Knowledge about wound management was generally good: 87.3% agreed first aid should be done within minutes of the bite and 72.7% said gloves should be worn while providing first aid. However, more than half underestimated the need to wash the wound for the full 15 minutes recommended (only 63.6% reported 15 minutes, 25.5% reported 10 minutes and 10.9% reported 5 minutes). Awareness of the anti-rabies vaccine was relatively high, but not all respondents expressed willingness to seek vaccination promptly after exposure.

Chi-square analysis revealed statistically significant associations between respondents' demographic characteristics and their knowledge of first aid and wound management practices ( $p < 0.05$ ).

**Table 1. Awareness of Rabies among Respondents (n = 275)**

Awareness of Rabies among Respondents	Yes n (%)	No n (%)	Don't know n (%)
Do you know what rabies is?	262 (95.3)	13 (4.7)	–
Do you know it is fatal?	250 (90.9)	25 (9.1)	–
Do you know it is transmitted by dog bite?	255 (92.7)	20 (7.3)	–
Do you know Pakistan has a high incidence of rabies?	190 (69.1)	85 (30.9)	–
Do you know rabies can be prevented by timely administration of vaccine?	240 (87.3)	35 (12.7)	–
Do you think rabies is curable?	40 (14.5)	190 (69.1)	45 (16.4)
Do you think you can develop rabies if you take vaccine as a preventive measure?	30 (10.9)	245 (89.1)	–

**Table 2.1. First Aid Actions Reported by Respondents**

First Aid Actions Reported	n	%
Rush immediately to nearest hospital	230	83.6
Wash the wound with soap under running water	200	72.7
Apply local home remedies (onion, turmeric, etc.)	55	20.0
Apply Dettol or other disinfectant	150	54.5
Suture the wound	35	12.7
Cover the wound with a bandage or dressing	90	32.7

**Table:2.2 Other Awareness Items**

Other Awareness Items	Yes n (%)	No n (%)
Should you wear gloves/protect yourself when giving first aid?	200 (72.7)	75 (27.3)
Should first aid be done within minutes of the bite?	240 (87.3)	35 (12.7)
Have you ever been bitten by a dog or know someone who was?	80 (29.1)	195 (70.9)
If yes, did you/they visit a hospital?*	60 (75.0)	20 (25.0)

**Table: 2.3 Preferred Duration for Washing Wound**

Preferred Duration for Washing Wound	n (%)
5 minutes	30 (10.9)
10 minutes	70 (25.5)
15 minutes	175 (63.6)

Table 2 highlights that most respondents (84%) would rush to a hospital and 73% would wash the wound with soap and water, showing good awareness of key first-aid practices. However, one-fifth still relied on home remedies and 13% believed suturing the wound was appropriate, practices that could hinder rabies prevention. Awareness of the need for prompt medical attention after scratches and licks was lower than for dog bites, and fewer than two-thirds knew to wash wounds for the recommended 15 minutes. These findings point to the need for targeted education to reinforce evidence-based first-aid practices and dispel harmful myths.

## 5. DISCUSSION

This cross-sectional survey among 275 members of the general public attending the outpatient department of tertiary care hospital of Karachi demonstrates both encouraging and concerning patterns of knowledge regarding rabies and its first-aid wound management. Almost all respondents (95.3%) had heard of rabies and 90.9% correctly recognized it as a fatal disease. These levels of awareness are higher than those reported in Khyber Pakhtunkhwa and Punjab, where 72–79% of respondents were aware of rabies and its fatality (Ahmed et al., 2020) and also exceed the low awareness reported from Nigeria (Al-Mustapha et al., 2021).

Although the level of basic awareness is high, there are still serious misconceptions. Only a quarter of those surveyed (14.5) thought that rabies is curable and a smaller number (16.4) of people did not know, which means that confusion regarding the prognosis of the illness remains. Also, 10.9% misinformed that preventive vaccine could cause rabies on its own, which is also corroborated by the results provided in India and Bangladesh, where false understanding regarding vaccination was also reported (Prakash et al., 2013; Rana et al., 2021).

Positively, 83.6 percent of respondents indicated that they would run to the hospital after being bitten by a dog, and 72.7 percent said they would use soap and running water to wash their wounds the first-aid step mentioned by WHO is important-based evidence of Pakistan and other countries in the South Asia was also supporting this fact (Khan et al., 2023).

Nevertheless, 20 percent of participants continued to refer to home remedies using turmeric or chilli powder, and 12.7 percent of participants would sew the wound up instantly. The two practices delay the ability of vaccines and multiply the risk of infection, which is also characterized in the research by Peshawar and Indian communities (Ahmad et al., 2024; Singh et al., 2020).

The use of protective practices was also inconsistently applied. Those who said they would use gloves in dispensing first aid were only 72.7 percent and less than two-thirds were aware of the need to wash a wound the required 15 minutes prescribed by WHO. These gaps also reflect the results of other South Asian researchers where the high level of vaccine awareness did not necessarily result in the proper wound management practices (Ahmed et al., 2020; Khan et al., 2023).

In general, the current study has shown that even though, basic information on rabies transmission and prevention in Karachi is high, durability to specific information on ideal wound care and post-exposure prophylaxis is poor. A very special health-education intervention addressing proper practice in the time spent in washing the wound, preventing dangerous traditional remedies and timely vaccination are adamantly urgent. Students, health workers and community have the potential to be some of the main channels of spreading the right information and usually correct the misconceptions that may be influential.

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