

Rising Water, Rising Risks: Uncovering the Perceptions on Leptospirosis Prevention and Control Among Barangay Workers in Barangay Tumana, Marikina City

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ABSTRACT

Background: Leptospirosis is a public health concern in flood-prone communities, where exposure to contaminated floodwater increases the risk of infection. Understanding how barangay workers perceive and practice prevention is important in identifying challenges and strengthening community-based leptospirosis prevention and control. **Objective:** To explore barangay workers' perceptions of leptospirosis prevention and control in Barangay Tumana, Marikina City. **Methods:** A descriptive phenomenological research study was conducted among 10 barangay workers aged 19 years and above in Barangay Tumana, Marikina City, selected through criterion-based sampling. Data were collected through validated semi-structured face to face interviews, audio-recorded and transcribed verbatim, then analyzed using thematic analysis. Informed consent, confidentiality, voluntary participation, and data protection were ensured. **Results:** Ten participants described leptospirosis as an occupational risk associated with floodwater exposure. Five themes emerged: Pre-existing Knowledge Influencing Perceptions of Leptospirosis; Perceived Risk and Barriers to Protection; Access to Information on Leptospirosis Prevention and Control; Health Risk Mitigation through Occupational and Community Interventions; Infection Control through Wound Management. **Conclusion:** Barangay workers recognized leptospirosis as an occupational risk and practiced various preventive measures, but barriers to consistent protection remained. Strengthening health education, occupational safety, and community-based interventions may improve leptospirosis prevention and control.

Keywords: leptospirosis; barangay workers; prevention and control; occupational exposure; flood-prone communities

INTRODUCTION

During the monsoon season, persistent flooding poses a major public health hazard in tropical, flood-prone urban environments across the Philippines (Muñoz-Zanzi et al., 2025). Underneath these floodwaters lies a major threat: leptospirosis, a bacterial infection caused by *Leptospira* excreted through the urine of infected animal hosts, particularly rodents (Shafie et al., 2021). The bacteria enter the human body through non-intact skin, eyes, or mucous membranes exposed to contaminated water or mud (Muñoz-Zanzi et al., 2025). Left untreated, leptospirosis can rapidly progress to severe clinical complications such as acute kidney injury, jaundice, and pulmonary hemorrhage syndrome, contributing to substantial morbidity and mortality during peak rainy seasons (Muñoz-Zanzi et al., 2025; Temporada et al., 2025). Although standard public health measures advocate for personal protective equipment (PPE) and post-exposure prophylaxis, seasonal outbreaks remain recurring challenges in low-lying communities (Temporada et al., 2025).

The Health Belief Model (HBM) contends that individual adherence to protective health behaviors is governed by perceptions of susceptibility, severity, benefits, and operational barriers (Temporada et al., 2025). While general community awareness regarding waterborne diseases is widely documented, a distinct knowledge gap persists regarding the specific risk perceptions and behavioral constraints of high-risk occupational workers (Temporada et al., 2025). Frontline personnel—including barangay staff, emergency responders, street sweepers, and sanitation workers—face unavoidable, prolonged exposure to floodwaters and hazardous runoff during emergency deployments (Muñoz-Zanzi et al., 2025; Temporada et al., 2025). Current public health strategies frequently fail to capture how emergency response demands and real-time

operational hurdles influence adherence to recommended safety measures among these essential workers (Temporada et al., 2025).

Addressing these behavioral and structural dynamics is essential for designing actionable occupational safety protocols (Temporada et al., 2025). Understanding how high-risk workers evaluate their occupational exposure and navigate preventive measures can directly inform localized health interventions, workplace policy adjustments, and resource distribution strategies (Quina, 2020; Temporada et al., 2025). Furthermore, evaluating frontline workers' real-world practices provides local health authorities with the evidence needed to strengthen health surveillance and reduce preventable occupational exposure during extreme weather events (Temporada et al., 2025).

This study explored the perceptions, preventive practices, and occupational barriers regarding leptospirosis control among high-risk workers in Barangay Tumana, Marikina City. Specifically, this paper addresses the central research question: What are the perceptions of barangay workers regarding leptospirosis prevention and control in Barangay Tumana, Marikina City? By analyzing risk appraisals, access to preventative measures, and post-exposure practices, this research aims to offer practical evidence to support local health governance, protect frontline personnel, and enhance community health resilience (Temporada et al., 2025).

METHODS

Study design

This study employed a qualitative descriptive phenomenological research design to explore the perceptions and lived experiences of high-risk barangay workers regarding leptospirosis prevention and control in a flood-prone community. The study utilized the Consolidated

Criteria for Reporting Qualitative Research (COREQ) as the applicable reporting guideline for qualitative research involving interviews.

Setting and participants

The study was conducted in Barangay Tumana, Marikina City, a flood-prone community located near the Marikina River. Participants were selected based on purposive criteria and included barangay workers aged 19 years and above whose occupations placed them at high risk of leptospirosis exposure. Ten participants were interviewed. Data collection began with five participants and continued with another five until data saturation was achieved, with no substantially new themes or responses emerging.

Areas of Inquiry and instruments

The study explored the perceptions and the lived experiences of high-risk barangay workers regarding leptospirosis prevention and control. The areas of inquiry focused on participants' understanding of leptospirosis, perceived risk and seriousness of the disease, and preventive and control practices. The study also explored participants' occupational experiences and perceived barriers related to leptospirosis prevention.

Data were collected using a researcher-developed and validated semi-structured interview guide. The instrument consisted of demographic questions and open-ended questions designed to encourage participants to describe their knowledge, perceptions, experiences, and practices related to leptospirosis prevention and control. An aide-mémoire was used during the interviews to guide the researchers and maintain consistency across participants while allowing flexibility for follow-up questions and elaboration.

Data collection

Prior to data collection, the researchers obtained permission from the appropriate barangay and health authorities. Individual face-to-face semi-structured interviews were conducted with eligible participants in Barangay Tumana. Each interview lasted approximately 20–30 minutes and was audio-recorded with the participants' consent. The recordings were subsequently transcribed verbatim to preserve the accuracy of the participants' responses.

Data analysis

The interview data were analyzed using thematic analysis following the six-phase framework of Braun and Clarke (2006). The researchers familiarized themselves with the transcripts, generated initial codes, searched for themes, reviewed the themes, defined and named the themes, and produced the final report. Peer debriefing was also conducted to help minimize potential bias and misinterpretation, while credibility, transferability, dependability, and confirmability were considered to support the trustworthiness of the findings.

Ethical considerations

The researchers obtained the necessary permissions from the City Health Office of Marikina City and Barangay Tumana before conducting the study. Participation was voluntary, and all participants were 19 years old and above. Written informed consent was obtained before data collection, with participants informed about the study, data collection procedures, audio-recording, confidentiality, and their right to withdraw. In accordance with the Data Privacy

Act of 2012 (RA 10173), participants' identities were protected through code numbers, and research data, recordings, and transcripts were securely stored and accessible only to the research team. The researchers also upheld the principles of autonomy, beneficence, and non-maleficence throughout the study.

RESULTS

Ten (10) participants were included in the thematic analysis. Five major themes emerged from the interview data: **(1) Pre-existing Knowledge Influencing Perceptions of Leptospirosis, (2) Perceived Risk and Barriers to Protection, (3) Access to Information on Leptospirosis Prevention and Control, (4) Health Risk Mitigation through Occupational and Community Interventions, and (5) Infection Control through Wound Management.**

Pre-existing Knowledge Influencing Perceptions of Leptospirosis. Participants demonstrated awareness of leptospirosis, its health risks, possible sources of infection, and experiences of cases within their community. One participant described the delayed onset of symptoms: *"Delikado, kasi hindi naman araw-araw na umaapekto yan sa katawan natin, minsan 2 days, 3 days, dun mo na mararamdaman."* (P1) Another associated the disease with rats and contaminated environments, stating, *"Kapag siguro ang mga masukal, eh syempre ayan ang pinupuntahan ng mga daga."* (P1)

Perceived Risk and Barriers to Protection. Participants recognized floodwater exposure during rescue and other occupational activities as a potential source of leptospirosis. However, the depth of floodwater and work conditions sometimes limited the use of protective equipment. As one participant explained, *"Kung malalim din yung tubig... paano ka pa magbo-boots?"* (P2)

Access to Information on Leptospirosis Prevention and Control. Participants reported receiving information through community-based seminars and rescue-related activities. One participant shared, *"Parati naman may seminar ang barangay regarding diyan sa leptospirosis."* (P1)

Health Risk Mitigation through Occupational and Community Interventions. Participants reported using protective equipment such as boots and PPE and described other preventive practices to reduce exposure. One participant stated, *"Bota, nakakatanggap kami ng libreng bota,"* while also noting that floodwater could still enter the boots (P1).

Infection Control through Wound Management. Participants reported cleaning and protecting wounds following exposure and seeking assistance from medical personnel. One participant described the practice as, *"Kapag po na-expose, hinuhugasan po ng running water; sinasabon, tapos alcohol na po."* (P3) Participants also reported having wounds properly covered by available medical personnel.

Table 1. Example participant characteristics

Participant ID	Age	Gender	Occupation
1	57	Male	Barangay Tanod
2	63	Male	Barangay Tanod
3	24	Female	Barangay Medic
4	64	Male	Head of Medic and Member of BDDRMO
5	22	Male	Barangay Medic
6	32	Male	Barangay Volunteer
7	22	Male	Barangay Messenger
8	26	Male	Barangay Public Safety Officer
9	41	Male	General Services Officer
10	27	Male	Department Dices

DISCUSSION

The experiences of high-risk workers suggest that leptospirosis prevention involves more than simply being aware of the disease. Previous evidence indicates that occupational and environmental exposure can increase the risk of leptospirosis, while knowledge and perceived risk may influence preventive practices (Baharom et al., 2023; Shafie et al., 2021). In this context, preventive behavior may be difficult to maintain when workers perform tasks under physically demanding or hazardous conditions, which may explain why awareness does not always result in consistent protective practices. Effective prevention therefore requires support beyond individual awareness, including accessible health information, appropriate protective equipment, proper wound care, and community-based measures. This is consistent with Sandoval et al. (2025), who emphasized coordinated occupational, environmental, and community approaches to leptospirosis prevention and control. However, because this study was qualitative and based on participants’ reported experiences, these interpretations do not establish causal relationships but provide context for strengthening occupational protection, health education, and community-based prevention efforts among workers in flood-prone settings.

Strengths and limitations

Strengths of this study include the use of a descriptive phenomenological design, direct interviews with high-risk workers, and systematic thematic analysis, which supported an in-depth understanding of their experiences and perceptions of leptospirosis prevention and control. Audio recording, verbatim transcription, and peer debriefing helped improve the accuracy and credibility of the findings. Limitations include the small sample of ten participants from one barangay and reliance on self-reported experiences, which may limit transferability and introduce recall or response bias. The findings should therefore be interpreted within the specific context of the study and may not represent all high-risk workers or flood-prone communities.

CONCLUSION

The study concludes that high-risk workers’ perceptions and preventive practices regarding leptospirosis during flooding are shaped by their existing knowledge, perceived risks, access to information, environmental exposure, and ability to apply protective measures. Although participants demonstrate awareness and use practices such as protective equipment and wound care, barriers to consistent prevention remain. Therefore, **nursing practice and community health programs should prioritize practical, accessible, and consistent health education, proper wound management, and promotion of appropriate protective measures**, while local health authorities and future researchers may use these findings to strengthen and evaluate community-based leptospirosis prevention strategies for high-risk workers.

IMPLICATIONS FOR NURSING AND HEALTH SCIENCES

The findings of this study provide practical guidance for strengthening leptospirosis prevention among high-risk workers in Barangay Tumana. First, **local government units (LGUs), barangay health workers, and community leaders** can use the identified gaps in knowledge and access to information to develop regular, targeted health education activities focusing on leptospirosis transmission, prevention, early signs and symptoms, and the importance of seeking immediate medical care. Second, **employers and occupational health personnel** can improve workplace safety by ensuring the availability and proper use of personal protective equipment (PPE), implementing clear safety protocols, and promoting appropriate wound care among workers exposed to potentially contaminated environments. Third, **health professionals and future researchers** can use the findings as a basis for developing and evaluating community-based interventions and communication strategies that are appropriate to the needs and working conditions of high-risk workers. These actions may contribute to improved preventive practices, earlier health-seeking behavior, and reduced occupational exposure to leptospirosis.

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AUTHOR CONTRIBUTIONS

M.C.F.H: Conceptualization, supervision, writing—original draft, writing—review and editing. K.G.A: Investigation, formal analysis, writing—original draft. J.A.D.A.B: writing—original draft. L.F.R.J: Investigation, formal analysis, data curation, writing—original draft. A.K.OM: Methodology, supervision, writing—original draft. K.O.N: Investigation, writing—original draft. M.A.A.S: writing—original draft. All authors reviewed and approved the final manuscript.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY

The research instrument (aide-mémoire) is included within the manuscript (Appendix C). The thematic coding framework and analytical codebook generated during the Braun and Clarke (2006) thematic analysis are available from the corresponding author upon reasonable request. Full audio recordings and raw interview transcripts are restricted to protect participant confidentiality in accordance with ethical standards.

REFERENCES

- Muñoz-Zanzi, C., Dreyfus, A., Limothai, U., Foley, W., Srisawat, N., Picardeau, M., & Haake, D. A. (2025). Leptospirosis—Improving healthcare outcomes for a neglected tropical disease. *Open Forum Infectious Diseases*, 12(2), 1–12. <https://doi.org/10.1093/ofid/ofaf035>
- Quina, C. (2020). Knowledge, attitudes, and practices of leptospirosis in Catbalogan City, Samar, *Philippines*. *American Journal of Public Health Research*, 2(3), 5–12. <https://doi.org/10.12691/ajphr-2-3-5>
- Shafie, N. J., Abdul Halim, N. S., Nor Zalipah, M., Mohd Amin, N. A. Z., Syed Esa, S. M., Md-Nor, S., Casanovas-Massana, A., Ko, A. I., Palma, F., Neves Souza, F., & Costa, F. (2021). Knowledge, attitude, and practices regarding leptospirosis among visitors to a recreational forest in Malaysia. *The American Journal of Tropical Medicine and Hygiene*, 104(4), 1290–1296. <https://doi.org/10.4269/ajtmh.20-0306>
- Temporada, K., Quinto, L., Tarraya, D. A., Sison, F. C., Marfil, J. F., Ramirez, C., & Ng, W. J. (2025). Awareness and preventive practices on leptospirosis in Flood-Prone communities of Marikina City, Philippines. *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/x71zvx65>