

Awareness of Dengue Disease among Female Community Health Volunteers of Sainamina Municipality, Nepal

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ABSTRACT

Dengue is a mosquito-borne viral infection that is a major public health problem in Nepal. Female community health volunteers play a vital role in dengue prevention and control by providing health education and services to the community. This study aimed to provide a comprehensive understanding of the level of dengue awareness among female community health volunteers in Sainamina Municipality, Nepal. This study involved a cross-sectional survey of 50 female community health volunteers aged 20 and above, actively engaged in health-related activities in Sainamina Municipality. A structured questionnaire was used to gather information on their knowledge of dengue transmission, symptoms, preventive measures, and available treatments. The findings revealed that 98 percentage of the female community health volunteers had a general knowledge of dengue, but there was some confusion regarding the specific mode of transmission. Their knowledge about the signs and symptoms, transmission routes, and preventive measures was inadequate. Only 74 percentage identified that dengue is transmitted through the bite of an infected *Aedes* mosquito. Additionally, 48 percentage of respondents were able to identify the *Aedes* mosquito, and 36 percentage knew that there was no specific medicine for dengue patients. Targeted efforts are needed to address the areas of confusion among the female community health volunteers and enhance awareness of comprehensive prevention strategies. It is recommended to conduct training, provide educational materials, and encourage them to share their knowledge with their communities to improve dengue awareness and prevention efforts.

Keywords: Dengue, Female Community Health Volunteers, Awareness

Introduction

Dengue fever, commonly known as dengue, is a mosquito-borne viral infection caused the dengue virus. It is a viral infection caused by the dengue virus (DENV), transmitted to humans through the bite of infected mosquitoes mainly the *Aedes* mosquitoes (WHO, 2022). It is a significant public health concern in many tropical and subtropical regions of the world. After feeding on a DENV infected

individual, the virus reproduces in the mosquito midgut before disseminating to secondary tissues, including the salivary glands (Kumar et al, 2020). The time it takes from ingesting the virus to actual transmission to a new host is termed the extrinsic incubation period (WHO, 2022). The extrinsic incubation period takes about 8–12 days when the ambient temperature is between 25–28°C. Variations in the extrinsic incubation period are not only influenced by ambient temperature; several factors such as the magnitude of daily temperature fluctuations, virus genotype, and initial viral concentration can also alter the time it takes for a mosquito to transmit the virus. Dengue fever is a mosquito-borne viral disease that poses a significant public health threat in many parts of the world, including Nepal. WHO (2022) states that about half of the world's population is now at risk of dengue with an estimated 100–400 million infections occurring each year. NHRC (2009) states dengue infections have the potential of rapid spread leading to acute public health problems, special attention is required to be paid for its surveillance, prevention and control. Dengue fever is susceptible to all ages and sexes. However, it is projected that 90% of dengue fever cases ensue in children below the age of 15 (NHRC, 2009).

Most people who get dengue won't have symptoms. But for those that do, the most common symptoms are high fever (up to 104°F or 40°C), severe headache, often behind the eyes, body aches mostly pain in muscles, joints, and bones, nausea and vomiting and skin rash, which may appear 2-5 days after the onset of fever and mild bleeding, such as nosebleeds or easy bruising (WHO, 2022). Some people develop severe dengue and need care in a hospital. The incubation period time from infection to the appearance of symptoms is typically 4 to 10 days. In some cases, dengue fever can progress to a more severe form known as Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS). Severe dengue is a medical emergency and can be life-threatening. Symptoms of severe dengue may include severe abdominal pain, persistent vomiting, bleeding from the nose or gums, difficulty in breathing, and a rapid drop in blood pressure.

There is no specific antiviral treatment for dengue fever. Supportive care, such as maintaining hydration and controlling fever, is essential for managing the disease. Most cases of dengue fever can be treated at home with pain medicine. Preventing mosquito bites is the best way to avoid getting dengue. The focus is on treating pain symptoms. Acetaminophen (paracetamol) is often used to control pain (Kumar et al., 2020). Non-steroidal anti-inflammatory drugs like ibuprofen and aspirin are avoided as they can increase the risk of bleeding (WHO, 2022). There is a vaccine called Dengvaxia for people who have had dengue at least once and live in places where the disease is common (Kumar et al., 2020). For people with severe dengue, hospitalization is often needed. Patients are advised to rest, drink plenty of fluids, and take acetaminophen (paracetamol) to reduce fever and pain. Non-steroidal anti-inflammatory drugs (NSAIDs) like aspirin or ibuprofen should be avoided, as they may increase the risk of bleeding (WHO, 2022).

Preventing dengue mainly involves controlling the mosquito population and avoiding mosquito bites. Measures include: Using mosquito repellents on exposed skin, Wearing long-sleeved clothing and pants, especially during peak mosquito activity times, Using mosquito nets while sleeping, eliminating standing water where mosquitoes can breed (e.g., in flower pots, discarded tires, containers), installing screens on windows and doors to prevent mosquitoes from entering buildings and community-based mosquito control programs. If you suspect dengue fever or are in an area with a known dengue outbreak, it is essential to seek medical attention promptly for a proper diagnosis and management. Early detection and supportive care can significantly improve outcomes for those affected by dengue fever.

Female Community Health Volunteers in Nepal

The use of community health volunteers to provide basic health care to the community has now become a regular practice in many nations (Shrestha, 2003). Their efforts in the health care system make health care more accessible and acceptable to the community. The Female Community Health Volunteer program was initiated in Nepal in 1988 to increase access to family planning services (Khatri, Mishra & Khanal, 2017). Female community health volunteers (hereafter FCHVs) are local women from the community who are trained and then left in the community to provide mother and child health and family planning services to their particular areas. There are 51,416 FCHVs in Nepal working at the local level (Ministry of Health and Population, 2023). The FCHV's primary role is to advocate for healthy behaviors among women and community members in order to promote safe motherhood, child health, family planning, and other community-based health promotion and service delivery. They are selected by members of the Mothers' Group for Health with the help of local health facility staff. FCHVs in Nepal provide key services such as the distribution of family planning commodities (pills and condoms), the distribution of iron tablets to pregnant and lactating mothers, the distribution of oral rehydration solutions, health education, communication, and community outreach, acting as a link between the health facility and the community and providing referral services, particularly for maternal and newborn services and support in-home delivery cases (Ministry of Health and Population, 2023). There are 71 FCHVs at Sainamaina Municipality (Department of Health Sainamaina Municipality, 2023). Female Community Health Volunteers are the backbone of Nepal's community-based health programs. They have made an important contribution to many community-based mother and child initiatives in diverse positions as health promoters, dispensers, and service providers at the local level. The role of community health volunteers in raising awareness and implementing preventive measures is crucial in combating the spread of dengue. This study aimed to assess the level of awareness of dengue disease among female community health volunteers in Sainamaina Municipality and identify potential areas for improvement.

Statement of the Problem

Dengue fever is a significant public health concern in Nepal, with reported cases on the rise in recent years. Female Community Health Volunteers play a crucial role in disseminating health information and raising awareness about infectious diseases among local communities. However, there is limited research on the level of awareness of Dengue disease specifically among Female Community Health Volunteers in the Sainamina Municipality of Nepal. Additionally, the research will investigate any potential gaps in knowledge and the factors that may influence their awareness levels, such as their age, educational background, training received, and years of experience as Female Community Health Volunteers.

This study aimed to provide a comprehensive understanding of the level of dengue awareness among female community health volunteers in Sainamina Municipality. The findings could help identify specific knowledge gaps and misconceptions, enabling the development of targeted interventions to improve dengue awareness and prevention efforts among this group. Ultimately, enhancing the knowledge of female community health volunteers can contribute to reducing dengue incidence and its impact on the community. The study intended to explore the Female Community Health Volunteers' knowledge and understanding of Dengue, including its transmission, symptoms, preventive measures, and available treatments. The specific objectives of this study were; to study the current level of knowledge and awareness of dengue disease among female community health volunteers in Sainamina Municipality and to explore the willingness of female community health volunteers to engage in dengue awareness campaigns and promote preventive measures. The research questions were what is the current level of knowledge and awareness of dengue disease among female community health volunteers in Sainamina Municipality? and what factors may influence female community health volunteers' understanding of the dengue disease?

Methods and Materials

This study was a cross-sectional survey designed to gather data on the awareness of dengue disease among female community health volunteers. Female community health volunteers aged 20 years and above, actively engaged in health-related activities were the population of the study. A sample of female community health volunteers aged 20 years and above, actively engaged in health-related activities in Sainamina Municipality, were engaged in the study. Accidental survey methods were administered for the 50 samples among 85 female community health volunteers of Sainamaina Municipality. A structured questionnaire was developed based on the research objectives. The questionnaire included both closed-ended and Likert-scale questions to assess various aspects of dengue awareness. The survey covered topics related to dengue transmission, symptoms, preventive measures, and information sources. The survey was administered to the selected

female community health volunteers in Sainamina Municipality. Data collection was conducted through face-to-face interviews on the basis of a questionnaire. For ethical considerations, participants got detailed information about the research objectives, procedures, and their rights. Informed consent was obtained from all participants before their involvement in the study. For confidentiality, the researcher assured that all data collected data would be treated with strict confidentiality, and participant identities were kept anonymous. Quantitative data obtained from the survey was analyzed using appropriate statistical methods such as descriptive statistics, chi-square tests, and correlation analysis. Statistical software (SPSS, 2020) was utilized for data analysis.

Result and Discussion

Demographic Characteristics of the Study Population

Over 50,000 female health volunteers work in Nepal (Khatri, Mishra & Khanal, 2017). There are 85 female health volunteers working in Sainamaina Municipality among them 50 were selected as a sample for the study. The demographic characteristic shows diverse in nature.

Table 1 Demographic Distribution of Respondents

Education of Respondents	Frequency	%
under SLC	32	64.0
SLC Pass	11	22.0
+2pass	6	12.0
+ 2 and above	1	2.0
Social groups of Respondents		
bramin	21	42.0
tharu	10	20.0
kshetri	6	12.0
dalit	3	6.0
Magar	10	20.0
Age of Respondents		
20-30	6	12.0
30-40	14	28.0
40-50	11	22.0
50 and above	19	38.0
Experience of Respondents		
1-4years	16	32.0
5- 9years	4	8.0
10-14years	8	16.0
15 years and above	22	44.0
Total	50	100.0

The above table shows the demographic characteristic of the sample which represents all study population. The educational status of the participants shows that the majority of respondents (64.0%) have an education level under SLC. 22.0% of respondents have an education level of SLC Pass. 12.0% of respondents have an education level of +2 pass. Only 2.0% of respondents have an education level of

above +2. The largest social group represented in the sample is Bramin (42.0%). Tharu (20.0%) and Magar (20.0%) are the second and third largest social groups represented in the sample, respectively. Kshetri (12.0%) and Dalit (6.0%) are the smallest social groups in the sample. The majority of respondents (38.0%) are aged 50 and above. 30-40 years olds make up 28.0% of the sample. 22.0% of respondents are aged 40-50 years old. Only 12.0% of respondents are aged 20-30 years old. Working experience as community female volunteers of respondents. The majority of respondents (44.0%) have 15 years or more of experience. 32.0% of respondents have 1-4 years of experience. 16.0% of respondents have 10-14 years of experience. Only 8.0% of respondents have 5-9 years of experience. So table shows that the respondents in the sample are relatively educated, with the majority of respondents having an education level of SLC Pass or higher. The majority of respondents also have a significant amount of experience, with the majority of respondents having 15 years or more of experience.

Knowledge about Sources of Dengue and Its Agents

Dengue is a disease caused by the dengue virus, which is spread to people by infected mosquitoes. Female Community Health Volunteers (FCHVs) in Nepal need to know the sources of dengue and its agents because their grassroots efforts can contribute significantly to reducing the burden of dengue and protecting the health of their communities. For the study of knowledge about sources of dengue and its agents, the participants were asked six questions and they responded to those questions.

Table 2 Knowledge about sources dengue and its agents

Knowledge about Dengue		
	Frequency	%
yes	49	98.0
no	1	2.0
Knowledge about transmission of dengue		
only Mosquito bite	20	40.0
Aedes mosquito bite	11	22.0
infected mosquito bite	19	38.0
Knowledge about agent mosquito		
all groups of mosquito	13	26.0
Aedes type of mosquito	37	74.0
Identification of Aedies Mosquito		
yes	24	48.0
no	26	52.0
Knowledge about time to bite by Aedes		
Day	42	84.0
Night	8	16.0
Knowledge about breeding place by Aedes		
place with clean water	43	86.0
place with dirty water	7	14.0
Total	50	100.0

Table no 2 shows participants' knowledge about sources dengue and its agents. 98 % of participants had general knowledge about dengue but 2 % of participants did not have any idea about it. In relation to knowledge about the transmission of dengue the respondents, 40% knew that dengue is transmitted only by mosquito bite. 22% knew that dengue was transmitted by an Aedes mosquito bite, and 38% knew that dengue was transmitted by an infected mosquito bite. This suggests that there is some confusion about the specific mode of transmission of dengue. 26 % of participants believed that dengue is transmitted through all groups of mosquito bites whereas 74 % of participants believed that dengue is transmitted only through the bite of an infected Aedes type of mosquito. Of the respondents, 48% were able to identify Aedes mosquito, while 52% were not. This suggests that there is a need to improve public awareness of how to identify Aedes mosquitoes. Of the respondents, 84% knew that Aedes mosquito bites during the day, while 16% knew that Aedes mosquito bites during the night. This suggests that there is good awareness of the time of day when Aedes mosquito bites. Of the respondents, 86% knew that Aedes mosquito breeds in places with clean water, while 14% knew that Aedes mosquito breeds in places with dirty water. This suggests that there is good awareness of the breeding places of Aedes mosquitoes.

The data suggests that the female community health volunteers were aware of dengue and its transmission. However, there is some confusion about the specific mode of transmission of dengue and the ability to identify Aedes mosquitoes. The majority of people in Dire Dawa City, Ethiopia don't know about dengue fever vectors, when they bite, when it's most likely to spread, or how to protect themselves. (Kebede. Tesema, Mesfin, &Getachew, 2023). Similar results were found by Jha et al (2016) in dengue hit area of Nepal, the results of this study showed that a large percentage of medical students have only moderate to low knowledge about dengue, and awareness-raising programs are needed for people of all professions and education levels. Community health volunteers play a vital role in dengue prevention and control. Their understanding of the sources of dengue and its agents, particularly the Aedes mosquito, is essential for educating, engaging, and mobilizing communities to reduce the risk of dengue transmission and its impact on public health. So they need to orientation to improve awareness about these aspects of dengue so that they could be aware community with their knowledge.

Knowledge about Basic Symptoms and Signs of Dengue

Dengue is a viral infection that can cause mild to severe symptoms. Most people recover within 1-2 weeks, but in rare cases, dengue can be fatal. Dengue is transmitted primarily by Aedes mosquitoes, particularly *Aedes aegypti*. It is a common mosquito-borne disease in tropical and subtropical regions, and its symptoms can range from mild to severe. Female Community Health Volunteers play a critical role in the healthcare system of Nepal, particularly in rural and remote areas where access to formal healthcare facilities may be limited. These trained volunteers serve as a vital link between communities and the healthcare system.

Table 3 Knowledge about basic symptoms and signs of dengue

Knowledge about basic symptoms and signs of dengue		
	Frequency	%
high fever	11	22.0
high fever and vomiting	9	18.0
high fever vomiting and head ache	25	50.0
Don't know	5	10.0
Knowledge about the season of transmission of dengue		
period of monsoon and premonsoon	12	24.0
period of monsoon and after monsoon	38	76.0
Knowledge about medicine for dengue patients		
i know	18	36.0
i don't know	32	64.0
Total	50	100.0

Table 3 presents the knowledge about signs and symptoms of dengue of female community health volunteers. 22 % of participants said high fever, 18 % said high fever and vomiting 50 % said high fever, vomiting and headache, and 10 % of participants didn't know the symptoms of dengue. 76 % of participants believed that most transmission seasons of dengue is period of monsoon and after monsoon, whereas 24 % believed that the transmission period is a period of monsoon and premonsoon. In the same way, 64 % of respondents didn't have any idea about the medicine of dengue but 36 % believed that cetamol is the basic medicine for treatment for dengue.

This data shows that the majority of respondents (50%) were able to identify the common symptoms of dengue: high fever, vomiting, and headache. However, a significant proportion of respondents (22%) were only able to identify high fever as a symptom of dengue. This suggests that there is a need to improve awareness of the full range of dengue symptoms. (Phuyal, et. al, 2022) studied the knowledge, attitude and practice of community people on dengue fever in Central Nepal: a cross-sectional study and found that both the awareness about Dengue fever and prevention measures were low. In this present study, only 36% of respondents knew that there was no specific medicine for dengue patients. This suggests that there is a need to improve awareness of the fact that dengue is a viral infection that cannot be cured with antibiotics it is because people who have ever spoken to a healthcare professional about dengue are more likely to practice preventive measures (Khanal, Thapa, & Khanal, 2021). The data also suggests that there is good awareness of the seasonality of dengue transmission. Still, there is a need to improve public awareness of the full range of dengue symptoms and the fact that there is no specific medicine for dengue patients. Subedi, Shah and Karki (2019) found the association between knowledge, age and occupation of the respondent and preventive practices in their study at Jhapa. Similarly, a study in Yemen found that only half of health workers had a basic understanding of dengue fever, despite the fact that Dengue Fever is a major emerging mosquito-borne disease in the country (Al-Jabri, & Al Jawfi, 2023). The study also found that most health workers had a

positive attitude towards Dengue fever, but their preventive practices were weak suggesting that the lack of knowledge and preventive practices among health workers is a serious health threat in Yemen (Al-Jabri, & Al Jawfi, 2023). Female community health volunteers need knowledge about the basic symptoms and signs of dengue because it equips them with the tools to prevent, detect, and respond to dengue cases within their communities. Their role in educating, raising awareness, and facilitating early medical intervention is vital in reducing the impact of dengue and protecting the health of the community.

Knowledge about Ways of Preventing Dengue

Female Community Health Volunteers are on the frontline of community healthcare in Nepal, and their knowledge of dengue prevention measures is essential for reducing the risk of dengue transmission, preventing outbreaks, and protecting the health of their communities. FCHVs are trusted members of their communities and have access to households that may not have access to other health services. They can provide essential information and support to help people prevent dengue.

Table 4 Knowledge about Ways of Preventing Dengue

Knowledge about Ways of preventing Dengue	Responses		% of Cases
	N	%	
Cover container of water	39	13.4%	83.0%
Do not allow water accumulate	40	13.7%	85.1%
Sleep in net	37	12.7%	78.7%
Remove water spots	34	11.7%	72.3%
Care in sanitation	30	10.3%	63.8%
use smoke	22	7.6%	46.8%
Wear whole body covering clothes	33	11.3%	70.2%
Use chemical and medicine	16	5.5%	34.0%
Lattice on windows and doors	22	7.6%	46.8%
Use Pesticides	18	6.2%	38.3%
Total	291	100.0%	619.1%

The multiple responses table shows the distribution of knowledge about ways of preventing dengue among respondents. The most common methods known to respondents were covering pots, containers, vessels, drums, etc. of water (83.0%) and not allowing water to accumulate (85.1%). Other common methods included sleeping in a net (78.7%), removing water spots (72.3%), and wearing whole-body covering clothes (70.2%). Less common methods included using smoke (46.8%), lattice on windows and doors (46.8%), use pesticides (38.3%) and use of chemicals and medicine.

Dengue is a mosquito-borne viral infection, and several factors contribute to its spread in Nepal. The frequent dengue outbreaks in Nepal are likely due to a

combination of factors, including unplanned urbanization, the spread of the *Aedes* mosquito, the open border policy with India, an inefficient dengue surveillance system, and insufficient preventive efforts by the government (Pokharel et al 2023). Dengue fever is a serious mosquito-borne disease that can be fatal. There is no specific treatment for dengue fever, so prevention is key (Sah et.al, 2023). Vector control is essential for the prevention of dengue fever which includes: Using paricide and chemicals to kill mosquitoes at all stages of their life cycle, covering standing water to prevent mosquito breeding, using chemical agents containing active substances to keep mosquitoes away using insect repellent, wearing long clothing treated with permethrin as an insecticide, covering windows and using mosquito nets to prevent mosquitoes from entering homes. Providing educational programs about disease transmission and preventative measures to increase the awareness of the general population and make them cooperative with public health specialists (Sah et.al, 2023). This study shows that majority of the respondents were aware of the most important ways to prevent dengue, including pots, containers, vessels, drums, etc. of water, not allowing water to accumulate, sleeping in a net, and removing water spots. However, there was less awareness of other effective methods of prevention, such as wearing whole-body covering clothes, using lattices on windows and doors, using pesticides, and use of chemicals and medicine.

Findings and Conclusion

The findings of this research reveal that the female community health volunteers in Sainamina Municipality generally possess a basic level of awareness about Dengue disease and its transmission. All most all of the respondents (98%) had general knowledge about dengue. Similar findings were found in northern Iran, a study by Nikookar et al. (2023) revealed that healthcare workers had higher knowledge associated with the transmission, clinical management, and prevention and control of dengue compared with its symptoms. The roles and responsibilities of health workers are indeed indispensable in delivering basic healthcare services, especially to vulnerable populations in India and elsewhere (Kalne, 2022). Acknowledging their efforts and providing them with respect and appreciation is a significant step in ensuring the well-being of the community and fostering a robust healthcare system. There is some confusion about the specific mode of transmission of dengue, with only 74% of respondents knowing that it is transmitted by the bite of an infected *Aedes* mosquito. Most female community health volunteers were aware of the common symptoms associated with the disease. The majority of respondents (50%) were able to identify the common symptoms of dengue: high fever, vomiting, and headache. There was also a strong understanding of the seasonality of Dengue transmission. Only 48% of respondents were able to identify the *Aedes* mosquito. Only 36% of respondents knew that there was no specific medicine for dengue patients. The majority of respondents were aware of the most important ways to prevent dengue, including covering pots, containers, vessels, drums, etc. water, not allowing water to accumulate, sleeping in a net, and removing water spots. However, there was less awareness of other effective methods of prevention, such as wearing whole-body covering clothes,

using lattices on windows and doors, use pesticides and use of chemicals and medicine. The findings suggest that there is a need to improve awareness among female community health volunteers about the specific mode of transmission of dengue, how to identify the Aedes mosquito, the full range of dengue symptoms, and the fact that there is no specific medicine for dengue patients. There is also a need to improve awareness of other effective methods of preventing dengue.

The female community health volunteers in Sainamina Municipality have a basic knowledge of Dengue disease, its transmission, and its common symptoms. However, there is a need for targeted efforts to address areas of confusion and to enhance awareness of more comprehensive prevention strategies to combat Dengue in the community. It is recommended to conduct training sessions on dengue disease, including the mode of transmission, identification of Aedes mosquito, symptoms, signs, and prevention. There is a need to provide educational materials on dengue disease, such as posters, leaflets, and brochures. It is also necessary to encourage female community health volunteers to share their knowledge about dengue disease with their communities. There is a need to support female community health volunteers to develop and implement dengue prevention programs in their communities.

References

- Al-Jabri, M. M., & Al Jawfi, A. M. (2023). Assessment of Knowledge and Attitude of Health Workers about Dengue Fever at Al-Hodeidah Governorate. *Sudan Journal of Medical Sciences*, 18(3), Aljaby11-yahoo.
- Department of Health Sainamaina Municipality, (2023). Record book of Female community health volunteers. Sainamaina Municipality.
- Jha, K. R., Kishore, Adhikari K., Shah. D.K., Ansari, S., A., Dhungana G., Bashnet, S. Shah, P. & Gayatri, K. (2016). Knowledge and Awareness regarding Dengue among the Undergraduate Health Science students of Dengue Hit region of Nepal. *Age*, 20(87), 27-8.
- Kalne, P. S., Kalne, P. S., Mehendale, A. M., & Kalne, P. (2022). Acknowledging the Role of Community Health Workers in Providing Essential Healthcare Services in Rural India Review. *Cureus*, 14(9).
- Kebede, T., Tesema, B., Mesfin, A., & Getachew, D. (2023). A Community-Level Knowledge, Attitude, and Practice about Dengue Fever and the Identification of Mosquito Breeding Containers in the Dire Dawa City of Ethiopia: A Cross-Sectional Study. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2023.
- Khanal, R., Thapa, R., & Khanal, M. (2021). Knowledge and preventive practices regarding dengue fever in Nepal. *Amer J Health Res*, 9, 218-28.
- Khatri, R. B., Mishra, S. R., & Khanal, V. (2017). Female community health volunteers in community-based health programs of Nepal: a future perspective. *Frontiers in public health*, 5, 181.

- Kumar, N., Verma, S., Choudhary, P., Singhanian, K., & Kumar, M. (2020). Dengue awareness and its determinants among urban adults of Rohtak, Haryana. *Journal of Family Medicine and Primary Care*, 9(4), 2040.
- Ministry of Health and Population (2023). Female Community Health Programme. Ministry of Health and Population
- National Health Research Council, (2009). Environmental Conditions Associated with Vector of Dengue and Corrective Actions for its Prevention in Nepal. National Health Research Council. Available at <https://nhrc.gov.np/wp-content/uploads/2017/02/Dengue-Report.pdf>
- Nikookar, S. H., Moosazadeh, M., Fazeli-Dinan, M., Zaim, M., Sedaghat, M. M., & Enayati, A. (2023). Knowledge, attitude, and practice of healthcare workers regarding dengue fever in Mazandaran Province, northern Iran. *Frontiers in Public Health*, 11.
- Phuyal, P., Kramer, I. M., Kuch, U., Magdeburg, A., Groneberg, D. A., Lamichhane Dhimal, M., ... & Müller, R. (2022). The knowledge, attitude and practice of community people on dengue fever in Central Nepal: a cross-sectional study. *BMC Infectious Diseases*, 22(1), 1-18.
- Pokharel, P., Khanal, S., Ghimire, S., Pokhrel, K. M., & Shrestha, A. B. (2023). Frequent outbreaks of dengue in Nepal—causes and solutions: a narrative review. *IJS Global Health*, 6(5), e0351.
- Sah, R., Siddiq, A., Padhi, B. K., Mohanty, A., Rabaan, A. A., Chandran, D., & Dhama, K. (2023). Dengue virus and its recent outbreaks: current scenario and counteracting strategies. *International Journal of Surgery*, 10-1097.
- Shrestha, S. (2003). A conceptual model for empowerment of the female community health volunteers in Nepal. *Education for Health*, 16(3), 318-327.
- Subedi, S., Shah, S. K., & Karki, K. (2019). Knowledge and preventive practices on dengue among slum dwellers of middle adulthood in Jhapa district of Nepal. *MOJ Public Health*, 8(4), 143-147.
- World Health Organization, (2022). *Dengue and Severe Dengue Fact Sheet*. World Health Organization

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