

Perceived Impact of Recent Dengue Outbreak in Kathmandu from Service Providers and Consumers Perspective

Kaushalya Shrestha,¹ Srijana Bhattarai,² Shalabh Shah,³ Diksha Kandel²

¹National Open College Pokhara University, ²Modern Technical College, HERD International.

ABSTRACT

Background: The first case of dengue in Nepal was recorded in Chitwan in 2005. Since 2006, Nepal has had annual outbreaks with previous largest outbreak in 2019 with 18,000 recorded cases, 42,504 reported cases in 2022 and 51 confirmed deaths. Dengue imposes significant economic and societal burdens on countries where the disease is endemic. The objectives of this study were to explore the perceived social impact of dengue experienced by health service providers and receiver from previous dengue outbreak.

Methods: A cross-sectional exploratory qualitative design was used to conduct the study in Kathmandu and Lalitpur Metropolitan City with the sample size of 16. Primary data were collected from two categories of respondents; Key informant interviews with health service providers and In-depth interviews with health service consumers using purposive sampling technique.

Results: The findings from the healthcare consumer's perspective showed how dengue had affected them physically, socially, and financially. Likewise, healthcare providers discussed their methods for dealing with dengue outbreaks and stressed the importance of having a well-prepared plan, protocols, and effective government responses in place.

Conclusions: The research provides insight into the need for coordinated efforts from all three tiers of government to implement preventive strategies for vector control so that its negative impact on physical health of affected people, financial and social burden could be minimized effectively. In addition, various challenges like inadequacy of human resources, logistics, increasing workload, and mental stress among health workers were highlighted.

Keywords: Dengue; impact; perspective; service consumers; service providers.

INTRODUCTION

Dengue is a vector borne illness with 400 million annual dengue incidences worldwide, endemic in more than 125 countries globally.¹ This shows the increasing dengue cases worldwide and similarly in Nepal, dengue is a rapidly emerging disease. Endemic across most provinces, dengue incidence has increased in recent years largely due to expansion of the vector. The districts of Kathmandu (n=9528; 33.8%) and Lalitpur (n=6548; 23.2%), reported the highest new cases in 2022.² Developing Country like Nepal faces a detrimental impact due to inclining dengue cases leading to delayed treatment, adverse health consequences and financial burden especially for low income families.³ Exploration of impact faced by people during dengue endemic helps to adopt different preventive strategies by government authority timely. So, the study aims to explore the perception of health service consumer and providers

regarding perceived impact of dengue outbreak and approaches used to control them.

METHODS

A cross sectional qualitative study was conducted to collect data from health service consumers and health service providers of Kathmandu and Lalitpur metropolitan city receiving services from the Sukraraj hospital.

Judgmental sampling was used to select the respondents from two tiers and they were selected purposively at the research site.⁴ The first tier of respondents selected were those patients (Health service consumers) who were diagnosed with dengue and visited health facilities for dengue treatment in Sukraraj Tropical Hospital, Teku. They were chosen from the selected household of Kathmandu and Lalitpur metropolitan city, based

Correspondence: Kaushalya Shrestha, National Open College Pokhara University, Email: kasidesth2014@gmail.com, Phone: +9779841158865.

on data that was reported during hospitalization in Sukraraj Tropical Hospital, Teku. The researcher sorted the contact list and based on personal inquiry and contact information respondents were interviewed. The second tier of respondents were licensed medical and paramedical health practitioners (Health service providers) who provided OPD and IPD services in Sukraraj Tropical Hospital, Teku during dengue outbreak.

Approval for the study was obtained from the Ethical Review Board (ERB) of Nepal health research council with the reference number 3754. Written approval for the study was taken from the hospital authority to access patient records. Written consent from all respondents for their participation in study was obtained prior the interview.

Credibility of tools was established through extensive literature review, feedback, correction, and series of discussion with content expert before finalization. Further pretesting was done among a few respondents to assess the adaptability of tools to the sociocultural background of the respondents and modification was done accordingly.

In-depth interview was performed for data collection from health service consumers, and key informant interview was performed to collect data from health service providers. The minimum sample size for the study was 20 qualitative interviews: 10 from each tier. Meanwhile data saturation was achieved from

16 interviews through repeated information received with no additional new information so, further data collection was stopped at this point. Immediate transcription and translation of audio recording after each interview helped the researcher to find out the point of information saturation. The face-to-face interviews were audio recorded and transcribed into text after completion of interview.

The text transcripts of all interviews were open coded in RQDA package of EZR version 3.4 after many readings and familiarization with the text.⁶ Trustworthiness was maintained by verification of translated documents via member checking and inter-coder percent agreement which was 87%.⁷ Theoretical thematic analysis with interpretivist approach was performed for further processing of data based on participant's knowledge, feelings, experiences, and expectations as an authentic source of information.⁸ Theoretical thematic analysis included series of steps from data transcription, translation, careful reading of script, codes generation and categorization of codes into preexisted theoretical themes of the study and summarization of report at last.

RESULTS

16 respondents were interviewed, 8 were health service consumers who were seeking health care services from Sukraraj Tropical Hospital, Teku, and 8 were health service providers who were working in Sukraraj Tropical Hospital, Teku during the dengue outbreak.

Table 1. Demographic characteristics of health service consumers.

S.N.	Code	Sex of respondent	Ethnicity of respondent	Occupation	Address of respondent
1.	IDI_1	Female	Upper caste	Receptionist	Gwarko, Lalitpur
2.	IDI_2	Female	Upper caste	Lecturer	Sankhamul, Kathmandu
3.	IDI_3	Female	Jana Jati	Administrator	Tinkune, Kathmandu
4.	IDI_4	Female	Upper caste	Office admin	Anamnagar, Kathmandu
5.	IDI_5	Male	Jana Jati	Student	Dallu, Kathmandu
6.	IDI_6	Female	Upper caste	Housewife	Koteshwor, Kathmandu
7.	IDI_7	Male	Jana Jati	Student	Balkumari, Kathmandu
8.	IDI_8	Female	Upper caste	Teacher	Jadibuti, Kathmandu

IDI-In-depth interview

Table 2. Demographic characteristics of health service providers.

S.N.	Code	Sex of the respondent	Ethnicity of respondent	Occupation	Address of respondent
1.	KII_1	Male	Madhesi	Doctor	Teku, Kathmandu
2.	KII_2	Male	Jana Jati	Doctor	Teku, Kathmandu
3.	KII_3	Male	Upper caste	Doctor	Sanepa, Lalitpur
4.	KII_4	Male	Jana Jati	Doctor	Teku, Kathmandu
5.	KII_5	Male	Jana Jati	Health worker	Bagbazar, Kathmandu
6.	KII_6	Male	Dalit	Doctor	Koteshwor
7.	KII_7	Female	Jana Jati	Ward in-charge	Ekantakuna, Lalitpur
8.	KII_8	Female	Jana Jati	RN	Battisputali, Kathmandu

KII- Key informant interview

Tables 1 and 2 present the demographic characteristics of the study respondents. Most respondents in the service consumer category were employed and predominantly female, indicating that dengue affects individuals in both indoor and outdoor environments. The majority of respondents belonged to the Janajati ethnic group, reflecting the demographic composition of residents in Kathmandu and Lalitpur metropolitan areas. Furthermore, the respondents' places of residence demonstrate that individuals from various core areas of the Kathmandu Valley sought treatment at the tertiary-level hub hospital for dengue. This underscores that dengue cases were distributed across the entire valley.

The respondents revealed diverse sources for getting information related to dengue, with social media playing a significant role in their knowledge acquisition.

The individuals, in discussions about dengue advocacy, shared that they had come across dengue advocacy through various social media platforms.

HCU 8- "I have heard about dengue from the social media but regarding the advocacy on dengue."

They expressed concerns about various adverse environmental factors contributing to the rise in temperature in Kathmandu Metropolitan City, like its high population density, congestion, pollution, and inadequate sanitation measures were identified as consequences of urbanization.

HCU 3 -"The temperature of Kathmandu is increasing day by day and is becoming favorable for mosquito

breeding as before it used to be in terai."

Respondents in the study showed a heightened concern for the application of preventive measures against dengue before an outbreak.

HCU 5-"We should take care of sanitation; we use mosquito nets and spray mosquito repellent properly. I covered the stored water, looked after proper cleanliness around the house."

At a summary, respondents demonstrated awareness of dengue prevention, emphasizing sanitation, proper water storage, and the use of mosquito nets and repellents. Social media played a crucial role in disseminating information about preventive measures, though advocacy efforts were less prominently recognized. Respondents acknowledged the importance of proactive actions to minimize the risk of dengue outbreaks in their communities.

Respondents reported experiencing persistent and severe physical symptoms associated with dengue. These symptoms included continuous fever, break bone pain, loss of appetite, dehydration, diarrhea, and vomiting.

The fear of hospitalization compelled them to apply every possible home remedy. However, as expressed painfully by the respondents, they could not get rid of the nightmare of hospitalization.

HCU 8- "I followed a home remedy initially, but the symptoms worsened, so I sought medical care first from a government hospital and then from a private

hospital."

The participant expressed concerns about receiving quality healthcare from a government hospital initially and considered seeking private healthcare due to fears of complications.

Some respondents in the study revealed that a reduction in platelets was a significant reason for hospitalization for platelet transfusions. They described dengue's debilitating effects, including severe weakness, body aches, and prolonged lethargy, significantly impacting their daily activities and recovery.

The study respondents shared the profound impact of dengue on their daily lives and social activities. Respondents highlighted the disruptive impact of dengue on their daily lives, with one mentioning impaired daily functioning and another noting the interference with social activities during a festive period.

Respondents voiced the financial challenges they faced as a result of dengue, citing long-term weakness and the inability to work. Additionally, they shared that their occupation was significantly affected by the illness, as they had to take over a month of unpaid leave due to the debilitating weakness caused by dengue, which in turn created a considerable economic burden.

Respondents conveyed the psychological toll of dengue, expressing stress, fear of transmission to others, low self-esteem, and loneliness.

HCU 2- "News on reoccurrence of disease occurs with severe complications and mortality from dengue made us more worried and stressed mentally."

Respondents expressed deep concern about the risk of transmitting dengue to other family members through mosquito vectors. One participant recalled feeling particularly stressed during their illness, worrying about the safety of vulnerable members in the household, especially children and the elderly, who were at greater risk of severe illness.

Respondents revealed a notable decline in their confidence levels due to physical weakness and persistent symptoms.

HCU 1-"I isolated myself from others which created a feeling of loneliness, and my self-esteem was lowered as before as I felt that I would not recover soon."

Another participant reported losing confidence at work, experiencing chest tightness, and feeling anxiety.

Respondents highlighted the psychological toll of dengue, reporting stress, anxiety, and fear of transmission to family members, especially vulnerable groups. They also experienced reduced self-esteem, loneliness, and a loss of confidence due to prolonged symptoms and physical weakness.

Respondents generally expressed satisfaction with the health services received during the hospitalization period, particularly emphasizing the positive behavior of health workers.

Respondents from the study reported significant challenges related to the availability of resources and waiting times during the dengue outbreak.

HCU 1- "But due to the crowd I waited for an hour for my turn to checkup. This was difficult as I had a fever."

The respondents expressed growing dissatisfaction and mistrust in government efforts for dengue prevention and control during outbreaks.

HCU 1-" The government should initiate effective measures to prevent pollution in the city. Kathmandu is widely populated, so this haphazard urbanization if not planned well will bring greater devastation in future."

Respondents emphasized the need for government accountability in health, advocating for strengthened public services, accessible healthcare, and an improved referral system.

Many of them revealed that even local response is not taken in the area they were residing in for prevention of dengue outbreak.

HCU 4-"I did not find any effort from local/ward level for its prevention in the place where I am residing."

During the dengue endemic, a critical issue emerged with inconsistent clinical protocols across hospitals.

Health workers reported confusion and inconsistent practices regarding blood transfusions during dengue due to a lack of clear protocols, compounded by misconceptions and limited availability of blood products.

During the dengue endemic, respondents emphasized

the lack of preparedness plans, particularly at Sukraraj, a tertiary level federal hospital.

A health service provider noted that while the referral center had made efforts to raise awareness through the circulation of Information, Education, and Communication (IEC) materials on dengue, there remained a critical gap in preparedness for managing the active phase of the disease. Based on their perspective and experience, a comprehensive response plan during outbreaks was still lacking.

Respondents emphasized the need for government-led preparedness, calling for the allocation of hub hospitals to manage dengue more efficiently, as concerns about the increasing trend of dengue cases were raised.

They emphasized the importance of a positive environment, especially during stressful emergencies.

HSP 2-"There was good cooperation and coordination between the staff team and hospital administration"

Despite strong administrative support, challenges emerged in managing crowds during increased dengue cases, with insufficient resources for crowd control, additional staff, and addressing patient complaints as revealed by respondents.

Health workers unanimously emphasized the government's crucial role in addressing the root cause of dengue.

HSP 6-"Global warming and climatic change is one of the reasons for increasing endemicity of dengue in Nepal. "

Respondents pointed out that Kathmandu Valley, previously considered less favorable, is now conducive to mosquito breeding due to rising temperatures linked to factors such as unplanned urbanization and improper waste management.

HSP 1-"The conditions are different in rest of Nepal. There are far more problems of stagnant water in Kathmandu valley both indoor and outdoor."

Health workers emphasized the need for a collaborative approach involving multiple sectors, including health, sanitation, drinking water, and government policymakers, to effectively address the dengue issue. They highlighted that while Teku hospital is a central facility, the focus should be on local and ward-level efforts to tackle the dengue endemic.

Health workers emphasized the importance of government-level interventions to address dengue. Recommendations include implementing community-level awareness programs, ensuring proper sanitation practices.

HSP 1-"Talking about the government level, there should be awareness programs at the community level."

The dengue endemic placed considerable strain on the health system, disrupting the delivery of other services like HIV, tuberculosis, and infectious disease care, with overcrowding leading to conditions such as two patients per bed.

The health service providers also revealed facing difficulties in patient management due to delayed referral from other health centers.

HSP 2-" the patients were received in their complicated stage as they were referred lately."

Respondents revealed that the increasing flow of dengue cases during the endemic compromised the availability of beds and affected other health services.

Global warming and climate change present a significant challenge to the health system, particularly in developing countries like Nepal, leading to the reemergence of vector-borne diseases such as dengue.

The dengue endemic placed significant pressure on the health system, leading to overcrowding, insufficient resources, and disruptions in other essential services such as HIV, tuberculosis, and infectious disease care. Health workers experienced stress and burnout due to inadequate human resources, particularly when staff became infected, highlighting the need for contingency plans in adverse situations. Delays in patient referrals further complicated management, as patients arrived at more advanced stages of illness. The increasing number of dengue cases compromised bed availability and impacted other health services. Additionally, respondents pointed to the changing pattern of dengue cases, with global warming and climate change contributing to the rise of vector-borne diseases, posing an ongoing challenge to the health system.

A word density analysis revealed that terms such as 'dengue,' 'fever,' 'transmission,' 'mosquito,' and 'stress' appeared with the highest frequency, reflecting concerns centered around physical symptoms, transmission risk, and mental distress. Likewise, theme density analysis

showed the most frequently coded segments were related to the perceived impact on physical and mental health (n=58), followed by health system preparedness and response challenges (n=46). This quantitative backing further reinforces the two conclusive themes derived through reflexive thematic analysis.

Table 3. Theme density analysis.

SN	Themes	Number of coded reference
1	Impact on Physical and Mental Health	58
2	Gaps in Health System Preparedness and Response	46
3	Knowledge, Awareness, and Preventive Practices	38
4	Social and Economic Impact of Dengue	34
5	Perceptions Toward Government and Local Response	31

The dual perspectives of both consumer and health service providers explores the overall impact of dengue outbreak provide in a summary presented below.

The dengue outbreak had a profound impact on individuals' physical, psychological, social, and economic lives. Respondents experienced severe physical symptoms, prolonged weakness, and hospitalization, which disrupted their daily routines and caused financial hardship due to missed work and healthcare costs. The psychological burden was equally significant, with stress, fear of transmission to family members, and feelings of isolation and low self-esteem being commonly reported. Despite having some knowledge about prevention, the community lacked adequate advocacy and support systems to cope with the outbreak's wide-reaching effects.

The health system response revealed critical shortcomings in preparedness planning, intersectoral coordination, and outbreak management. Although awareness materials were circulated, structured preparedness protocols and timely government-led interventions were lacking. Health facilities faced resource constraints, staff shortages, overcrowding, and delayed referrals, compromising the quality of care and affecting services for other diseases. Both consumers and providers emphasized the urgent need for a coordinated, multisectoral approach including improved urban planning, sanitation, and climate-

responsive policies to strengthen the primary prevention and control of dengue in urban settings like Kathmandu.

DISCUSSIONS

The present investigation revealed the perceived consequences of the dengue outbreak among selected respondents in the Kathmandu and Lalitpur metropolitan cities. Comparable studies assessing the impact were conducted in other dengue-endemic regions such as Brazil, Pakistan, and Puerto Rico.^{3,9,10}

This investigation delved into the factors contributing to the dengue endemic in the Kathmandu Valley which attributed it to climate change, the densely populated urban environment, poor sanitation, and improper waste disposal. Similar factors were highlighted in studies conducted in Nepal and Malaysia.¹¹⁻¹³ These similarities in the finding may be due to the global effect of climate change leading to increase cases of dengue all over.

The health service consumer verbalized harsh physical impact of dengue on health and this was synonymous to different studies.¹³⁻¹⁵

The current study revealed about the financial impact of dengue where people with less income, had to bear financial loss, salary deduction due to unpaid leave and difficulty in managing household expenses. The finding contrasts with the study done in Pakistan revealing that people had socioeconomic impact due to job absenteeism.⁹ Similar findings were also shown by study done in Brazil.³ The specific nature of the impact may differ, the broader financial strain from dengue is a shared concern across different regions.

Apart from social and financial impact, the current study also revealed the mental impact of dengue outbreak on people. The study unfolded fear of transmission of disease, stress due to hospitalization, low self-esteem due to long term weakness which was similar with the findings of Brazil and Pakistan revealing the prevalence of anxiety, depression, and low self-esteem in people.^{3,13} These shared findings suggest that the psychological toll of dengue is a widespread concern, with similar patterns of mental health challenges reported in different cultural and geographic contexts.

The study also explored the perception of people towards health system and government responses stating that people were satisfied by the service they received however, they revealed about the crowd in hospital, and the long waiting hours and rush of a

health worker giving their best to handle the endemic and the same is being reported elsewhere across the world.^{1,31,3,17,18} These issues are commonly reported in other parts of the world as well, suggesting that the strain on healthcare systems during infectious disease outbreaks, especially when cases increase rapidly, is a widespread phenomenon. The study revealed that people have negative opinion towards local government response on dengue management which was similar to the finding of the study conducted in Bangladesh.¹⁶ This may reflect broader systemic issues, such as inadequate preparedness, resource limitations, or a perceived lack of effective coordination in the response to public health emergencies.

The current study discloses about handling of dengue endemic without supportive protocol, and preparedness plan making strong appeal for proper preparedness plan. The same kind of appeal was made by the health worker regarding need for government support during endemic period in Singapore, Nepal, India and Brazil.¹⁹⁻²¹

The study was conducted only in Kathmandu and Lalitpur metropolitan cities, limiting the generalizability of the findings to other regions in Nepal. The impact and responses may differ in rural areas or other urban settings with varying healthcare infrastructure and resource availability. The study used interviews and verbal accounts, which are based on respondents' perceptions and may be influenced by recall bias, social desirability bias, or personal emotions.

CONCLUSIONS

The 2022 qualitative study explored the perceived impact of the dengue outbreak in Kathmandu from the perspectives of Health Service Providers and Consumers. It revealed significant physical, social, and economic repercussions, stressing the need for effective government response, preparedness plans, consistent protocols, and coordinated efforts across all government tiers for vector control and prevention.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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