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Research Paper

Exploring handwashing knowledge and practice among lactating mothers in Kathmandu's slum communities, Nepal

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ABSTRACT

Hand hygiene is an evolving public health issue in low-income countries such as Nepal. Poor water, sanitation, and hygiene infrastructure and practices lead to high morbidity in children under five. This study focuses on handwashing practices and disease occurrence among breastfeeding mothers in two slum settlements in Kathmandu along the Bishnumati River: Samakhusi and Tangkesower. A cross-sectional study using a semi-structured questionnaire was conducted with 127 breastfeeding mothers having at least one child. Both univariate and bivariate analyses were conducted using SPSS version 25. In the bivariate analysis, $p < 0.05$ was considered statistically significant. The majority of lactating mothers demonstrated good knowledge and appropriate practices in handwashing; many (81.1%) had good handwashing practices. Significant associations were found between maternal education level and childhood illness ($p < 0.001$); the prevalence of illness among children whose mothers had only basic education was 26% higher than children who had mothers with secondary education. Family income and handwashing practice were also significantly associated with child health ($p < 0.01$). Notably, 73.2% of children had experienced diarrhoea in the past 6 months. Strengthening maternal hand-hygiene education programmes, particularly for lactating mothers, and improving WASH infrastructure are necessary, as well as promoting affordable handwashing solutions in urban slums.

Key words: breastfeeding mothers, child health, hand hygiene, sanitation, slum communities

HIGHLIGHTS

- This study investigates handwashing knowledge and practices among lactating mothers.
- Handwashing practices are linked to maternal education and family income levels.
- Improved maternal education and hygiene access can reduce child morbidity rates.

INTRODUCTION

Hand hygiene, a critical component of public health, especially in combating water, sanitation, and hygiene (WASH)-related diseases, disproportionately affects vulnerable populations, particularly children under five. Globally, poor hygiene contributes significantly to morbidity and mortality, with approximately 1.9 million deaths in this age group attributed to diarrheal diseases annually (World Health Organization (WHO) 2019). In Nepal, access to safe water supply has been improving, but women and girls are still particularly vulnerable to water insecurity and bear the major burden of inadequate WASH facilities (Wali *et al.* 2020; Shrestha *et al.* 2023). However, just 12% of Nepalese people wash their hands with soap during critical times, highlighting a significant gap in hygiene practices (NDHS 2022; Dhital *et al.* 2024). Improving hand hygiene can serve as a vital intervention in reducing these health risks, particularly among marginalized communities such as those living in urban slums.

High population density, substandard living conditions, and limited access to basic services such as clean water and sanitation facilities characterize urban slum settlements in Nepal. Gautam & Basnet (2020) highlighted that illegal land occupancy and a lack of municipal services exacerbate the health risks faced by slum residents. Khanal & Khanal (2022) estimated that there were 65 slums in Kathmandu Valley with 4,696 households. Breastfeeding is one of the best ways to protect babies, especially in poverty, as it is associated with a lower incidence of sudden infant death syndrome, necrotizing enterocolitis, diarrhoea, and hospital admissions, and offers protection against respiratory infections (Victora *et al.* 2016).

However, lactating mothers in slums often have poor knowledge of hygiene. Despite the clear links between poor hygiene and child health outcomes, there is a paucity of research on the handwashing behaviour of lactating mothers in slum communities (Shrestha *et al.* 2020). While several studies in low- and middle-income countries have examined handwashing among caregivers and their links to child health outcomes, few have specifically focused on lactating mothers in informal urban settlements. For instance, studies in Nigeria, India, and Bangladesh have documented a general awareness of handwashing but also a persistent gap between knowledge and practice due to cultural, infrastructural, and economic barriers (Aigbiremolen *et al.* 2015; Ahmmed *et al.* 2017; Chatterjee *et al.* 2022). A systematic review by Wolf *et al.* (2022) emphasized that handwashing with soap significantly reduces diarrhoeal diseases, yet implementation in slum settings remains limited. Although some literature in Nepal has examined hand hygiene in schools or among caregivers (Devkota *et al.* 2020; Sharma *et al.* 2024a), there remains a notable paucity of empirical studies exploring handwashing among lactating mothers residing in urban slums. Moreover, the Nepal Demographic and Health Survey (NDHS 2022) reported that only 12% of people practice handwashing with soap at critical times, but it did not disaggregate this by maternal or slum population status. This study addresses a critical gap by focusing on this overlooked demographic in a highly marginalized setting, offering both statistical insights and a contextually grounded understanding of maternal hygiene practices and child health outcomes in urban slums of Kathmandu.

Kathmandu, the capital of Nepal, has a growing slum population residing in informal settlements. One-fifth of the city's population lives in slums, characterized by poor housing, inadequate sanitation, and limited access to basic services (UN-Habitat 2015). These settlements are mainly located in vulnerable areas, such as along the banks of rivers with flooding risks, and residents often face eviction. Slum dwellers include rural migrants, daily wage labourers, and marginalized groups such as Dalits and ethnic minorities (Subedi 2019). In Nepal's caste system, Dalits are the lowest in the social hierarchy (Thapa *et al.* 2021). This study aims to fill this academic research gap by assessing the knowledge and practices of handwashing among lactating mothers and disease occurrence living in slum settlements in Kathmandu, Nepal.

METHODS

Research design and methods

This study employed a cross-sectional design to assess the knowledge and practices related to handwashing among breastfeeding mothers residing in urban slum settlements in Kathmandu. Data were collected in July 2021 with precautions in place to maintain physical distancing due to the ongoing COVID-19 pandemic. The study focuses on two slum settlements along the Bishnumati River: Samakhusi and Tangkesower (Figures 1 and 2). These locations were selected due to their substantial population of lactating mothers and great socio-economic challenges.

Study area

The Samakhushi slum, located along the Bishnumati River in Kathmandu, represents a densely populated informal settlement characterized by precarious living conditions and acute socio-economic vulnerability. Residents of this slum are predominantly low-income migrants from rural districts, driven to the capital in search of better lives. The area is marked by temporary materials, lacking formal land tenure and basic urban infrastructure. Chronic deficiencies in sanitation, access to potable water, waste management, and flood resilience exacerbate public health risks, particularly during the monsoon season when riverbank erosion threatens both property and life. Despite these challenges, Samakhusi exhibits complex social dynamics, including robust informal economies and community-based coping mechanisms that enable residents to navigate systemic marginalization with Kathmandu's rapidly urbanizing landscape.

The Tangkesower slum, situated further downstream along the Bishnumati River, is similar and epitomizes the struggles of Kathmandu's urban poor, albeit with distinct spatial and environmental vulnerabilities. The settlement has evolved in a highly congested, ecologically fragile zone where river pollution, solid waste accumulation, and frequent waterlogging exacerbate

Figure 1 | Samakhushi slum on the Bishnumati bank, Kathmandu, Nepal.

Figure 2 | Tangkesower slum on Bishnumati bank, Kathmandu, Nepal.

the hardships faced by its inhabitants. Many dwellings in Tangkesower are positioned dangerously close to the eroding river embankments, rendering them highly susceptible to displacement during seasonal floods. The absence of secure housing rights, combined with limited access to health, education, and municipal services, perpetuates intergenerational poverty

within the community. Nevertheless, Tangkesower reflects resilient grassroots social networks that engage in mutual aid, informal labour exchanges, and advocacy for greater recognition and intervention from local authorities.

Sample and sampling procedure

The target population comprises breastfeeding mothers with children under five in the study area. The sample size was calculated using the standard statistical formula for the finite population: $n = N/(1 + N(e)^2)$, where N represents the finite population (lactating women having children aged less than 5 years) in the selected areas ($N = 186$), 'e' margin of error or acceptance range of error ($e = 5\%$) margin of error; 0.05 assumed), and 'n' represents the corrected sample size. Since the calculated sample size was 126, 63 women were selected from each Samakhusi and Tangkesower settlements. However, we have included one additional participant ($n = 127$) based on probability theory (Pant *et al.* 2024). Women were selected through random stratified sampling. Data were collected in person by researchers using a structured questionnaire.

Data collection tools

The data were collected using structured survey tools administered face-to-face with lactating women at their residences at a convenient time. Consent was obtained from respondents who were assured of confidentiality and anonymity. Participants were informed that they could exit the survey anytime they wished and could opt not to answer particular questions they felt uncomfortable with. No incentives, such as money or any goods, were offered (Sharma & Adhikari 2022). All collected data were checked, cleaned, and entered into Statistical Package of Social Science (SPSS) version 25.

Validity and reliability

The content validity and or face validity was assessed by three experts before and after pilot testing (Sharma *et al.* 2024a). The questionnaire was piloted (van Teijlingen & Hundley 2005) with 10 lactating mothers not taking part in the main study. Instantly, after the pilot test, researchers revised the unclear, obscure, and complex items, reworded them based on the experts' remarks. Additionally, the researchers discarded some ineffective and non-functioning questions. Reliability of the used instruments was ensured through the coefficient and Cronbach's alpha test, the value ranging from 0.75 to 0.79 for all variables, indicating acceptable levels of internal consistency for each domain, which showed reliable and validate instruments for the real field implication (Sharma *et al.* 2024b). In the main study, households were randomly selected that had children under the age of five. In case mothers had more than one child under the age of five, the researchers purposely selected those mothers with younger children.

Data management and analysis

Data were analyzed using SPSS version 25, with univariate analyses (frequency, percentage, mean) describing the demographic characteristics of respondents and bivariate analyses (Chi-square tests) examining relationships between variables. We employed the Chi-square test to assess associations between categorical variables, to evaluate bivariate relationships rather than adjust for confounding factors. While multivariate analysis could provide additional insights by controlling for covariates, we prioritized simplicity and clarity given the exploratory nature of our research questions and the structure of our dataset.

Ethical consideration

Ethical approval was obtained from the Research Management Cell, Tribhuvan University, Nepal. Ethical considerations included obtaining written informed consent from all participants, emphasizing voluntary participation, and ensuring confidentiality of responses. Prior to obtaining consent, all respondents were informed that they could abstain from answering certain or all items and had the freedom to discontinue the survey at any time (Sharma *et al.* 2021). Respondents were assured of both anonymity and confidentiality, and a unique code was ascribed to participants, not their real names.

RESULTS

Table 1 depicts the socio-demographic profile. Most mothers (73.2%) were older than 20, a large minority was Hindu (40.2%), and 59.1% had only a basic level of education. Over three-quarters (77.2%) were not high caste (i.e. non-Brahmin), and a similar proportion identified as homemaker or housewife (78.7%). The majority (59.1%) of respondents revealed that their own work was the main family income source, and only 40.9% said that their husbands' job was the source of income, while 59.8% earned equal to or less than 10,000 Nepalese rupees (NPR)/month (in July 2021, this represented US$83).

Table 1 | Profile of participants

Variable	Frequency ($n = 127$)	Percentage	95% Confidence interval
Age			
≤20 years	34	26.8	18.4–35.2%
>20 years	93	73.2	64.8–81.6%
Religion			
Hindu	51	40.2	31.6–48.8%
Non-Hindu	76	59.8	51.2–68.4%
Caste			
Brahmin	29	22.8	15.6–30.0%
Non-Brahmin	98	77.2	70.0–84.4%
Educational qualification			
Basic	75	59.1	50.6–67.6%
Secondary and above	52	40.9	32.4–49.4%
Mother's occupation			
Housewife	27	21.3	13.6–29.0%
Housewife and others	100	78.7	70.9–86.5%
Main income source of the family			
Women's labour	75	59.1	50.5–67.7%
Husband's job	52	40.9	32.3–49.5%
Family income per month			
≤10,000 rupees (Poor)	76	59.8	51.2–68.4%
>10,000 rupees (Survival)	51	40.2	31.6–48.8%
Total	127	100.0	

Handwashing practices by participants

Table 2 shows that just one variable, namely family income, is significantly associated with handwashing practices among women in slum families. Poorer mothers (≤10,000 NPRs/month income) were more likely to wash their hands (52.8%) than those earning >10,000 NPR/month income (52.8 vs. 28.3%; $p < 0.01$). There is no statistically significant difference in handwashing practices in slum areas based on religion, education, or knowledge of WASH among the mothers.

Diseases occurred among children

Table 3 presents an association between illnesses in children experienced in the past 6 months with mothers' demographic factors such as age, ethnicity, mother's education level, occupation, and family income using Chi-square tests. Just one variable, mothers' education level, is significantly associated with the child's illness in the past 6 months reported by mothers. Most mothers (81.3%) from basic level education (grades 1–8) shared that their children were ill in the past 6 months; however, just above half of the mothers (55.5%) who achieved secondary level education (grades 9–12) reported this, which is significantly associated with $p < 0.001$. The proportion of children getting ill was 26% higher for mothers who had just a basic level of education compared with those mothers with secondary education.

Other variables were not significantly associated with the children's illness in the past 6 months. Thus, these variables have no pivotal roles in determining childhood illness.

DISCUSSION

This study offers a comprehensive examination of handwashing practices among breastfeeding mothers residing in the slum settlements of Kathmandu, yielding critical insights into the socio-demographic characteristics and health outcomes of this vulnerable population. A notable finding is the pronounced disparity between knowledge and actual practice: the majority,

Table 2 | Handwashing practice by demographics

Variables ($n = 127$)	Category	Handwashing practice		Total	χ^2	*Df*	*p*-value
		Poor	Good				
Age (years)	≤20	21 (16.5)	72 (56.7)	93 (73.2)	3.07	1	0.08
	>21	3 (2.4)	31 (24.4)	34 (26.8)			
	Total	24 (18.9)	103 (81.1)	127 (100.0)			
Religion	Non-Hindu	17 (13.4)	59 (46.5)	76 (59.8)	1.48	1	0.22
	Hindu	7 (5.5)	44 (34.6)	51 (40.2)			
	Total	24 (18.9)	103 (81.1)	127 (100.0)			
Mother's education	Secondary (9–12)	8 (6.3)	44 (34.6)	52 (40.9)	0.70	1	0.40
	Basic (1–8)	16 (12.6)	59 (46.5)	75 (59.1)			
	Total	24 (18.9)	103 (81.1)	127 (100.0)			
Family income (monthly)	≤10,000	9 (7.1)	67 (52.8)	76 (59.8)	6.14	1	0.01*
	>10,000	15 (11.8)	36 (28.3)	51 (40.2)			
	Total	24 (18.9)	103 (81.1)	127 (100.0)			
Knowledge level of handwashing practice	Poor	8 (6.3)	39 (30.7)	47 (37.0)	0.17	1	0.67
	Good	16 (12.6)	64 (50.4)	80 (63.0)			
	Total	24 (18.9)	103 (81.1)	127 (100.0)			

Note: Chi-square is significant at $*p < 0.05$.

Table 3 | Diseases occurred among children by mothers' demographics

Variables		Illness in children in the past 6 months							
		Yes		No		Total			
		N	%	*N*	%	*N*	%	χ^2	*p*-value
Age	≤20	26	76.5	8	23.5	34	100.0	0.70	0.40
	>21	64	68.8	29	31.2	93	100.0		
Ethnicity	Brahmin	21	72.4	8	27.6	29	100.0	0.44	0.83
	Non-Brahmin	69	70.4	29	29.6	98	100.0		
Mother's education level	Basic level (1–8)	51	81.3	14	18.7	75	100.0	9.72	0.00*
	Secondary (9–12)	29	55.8	23	44.2	52	100.0		
Mother's occupation	Housewife only	20	74.1	7	25.9	27	100.0	0.89	0.34
	Housewife + others	70	70.0	30	30.0	100	100.0		
Monthly income of the family	≤10,000	34	44.7	42	55.3	76	100.0	0.17	0.67
	>10,000	28	54.9	23	45.1	51	100.0		
Total		90	70.9	37	29.1	127	100.0		

Note: Chi-square is significant at $*p<0.05$.

81.1% of respondents, reported washing their hands with soap after defaecation. This observation is consistent with findings from analogous studies conducted in low-income settings, where a gap between awareness and behavioural implementation is frequently observed. Such discrepancies are often attributed to structural barriers, including limited access to water and soap, as highlighted by Jenkins *et al.* (2015), von Salmuth *et al.* (2021), and Wolf *et al.* (2022).

Handwashing knowledge among breastfeeding mothers

The handwashing practices among lactating mothers influence the health of their children in many ways. In the present study, most (81.1%) had good knowledge of handwashing. This finding corresponds with a study in Tamil Nadu, India, where 78.0% had good knowledge of handwashing (Chatterjee *et al.* 2022). Similarly, a study conducted in Nigeria found that more than three-quarters (83.4%) of the respondents had good knowledge on the importance of handwashing, diseases caused by poor handwashing, materials needed to wash hands, and critical times to wash hands with soap and water (Aigbiremolen *et al.*

2015). These findings are similar to those found in the Osegbo study, where good handwashing knowledge was overwhelming (99%) (Gawai *et al.* 2016; Steenkamp *et al.* 2022).

In contrast, a study in a poor setting of Kenya showed that breastfeeding mothers having a child under 5 years of age have poor knowledge (19%) of handwashing materials and their importance for health (Adeleke & Mhlaba 2019). Although the study area is geographically accessible for everyone, no handwashing-related health education intervention activities were conducted by any individual researcher or organization. In addition, the present study showed that the level of knowledge on handwashing is lower than the practice level of handwashing when compared with the study conducted in Mumbai, India (Idris *et al.* 2020), and our study also found a gap between the awareness level of knowledge and the level of practice of handwashing.

Handwashing practices among lactating mothers

The present study revealed that mothers' age and educational level are significantly linked to good handwashing practices and child health outcomes. Mothers aged 20 and under demonstrated better handwashing practices (56.7%) compared with those over 20 (24.4%), with no statistically significant difference ($p = 0.08$), though a trend was observed. The value is not significant but may indicate a trend worth further investigation. Additionally, mothers' education level was significantly associated with the incidence of child illness in the past 6 months. A higher proportion of mothers with basic education (grades 1–8) reported their children falling ill (81.3%), while only 55.5% of mothers with secondary education (grades 9–12) reported the same, showing a significant association ($p < 0.001$). The likelihood of children falling ill was 26% higher among mothers with only a basic education compared with those with secondary education. These findings underscore the importance of maternal age and education in influencing hygiene practices and child health. This pattern of handwashing practice is almost similar to a study on environmental risk factors for diarrhoea among breastfeeding mothers carried out in Nigeria and Ethiopia, which found that 81% of respondents washed their hands properly (with soap and water after toilet use and before preparing food and drinks) (Aigbiremolen *et al.* 2015; Dyda *et al.* 2020). Similarly, it closely replicates what was recorded in a study in rural India. The figures were 73.18% washed hands in a proper way, which indicates that after defaecations, 63.91% after cleaning the child who had defaecated, and 29.98% before feeding the child, respectively (Datta *et al.* 2011).

This study found that mothers in slum settlements have better handwashing practices compared with the national average, which is a notable contrast, as slum areas are often associated with poorer living conditions and limited access to resources. The national data reflects a broad overview of handwashing behaviour, highlighting a critical public health issue. Dhital *et al.* (2024) and NDHS (2022) indicated that just 12% of Nepalese people wash their hands with soap during critical times; this is significantly lower than mothers aged 20 and under (56.7%) in our study and of those above 20 years (24.4%). This suggests that younger mothers may be more aware of or more likely to adopt proper hygiene practices. While the national average for handwashing with soap is low (12%), mothers in slum settlements exhibit better practices, possibly due to targeted health interventions or community-based awareness programmes in these areas. The higher prevalence of good handwashing practices among younger mothers could indicate the influence of recent health education campaigns, better access to information, or generational differences in attitudes towards hygiene.

The proportion of respondents who had good handwashing practice in this study was 81.1% which is higher than found in Madhya Pradesh, India, which showed just 22.0% (Bhattacharya *et al.* 2011). Over four out of five respondents (81.1%) wash their hands with soap and water, which is higher than NDHS (2022) (47.8%), Morang Nepal (65.0%), urban slum of Pokhara, Nepal (71.4%), and eastern Uganda (76.0%) (Karn *et al.* 2011; NDHS 2022). Correspondingly, a study conducted in Karnataka, India, found a significant percentage (90%) of mothers practising Hand Washing with Soap (HWWS) after defaecation. In comparison, far fewer (38%) did so before breastfeeding their child (Aithal *et al.* 2014). The systematic review found the result of this study corresponding with the global prevalence of HWWS, only 19% after compiling 42 studies all over the world. Furthermore, this study found no statistically significant association between the mother's educational level or knowledge level on the one hand, with the practice of handwashing with soap on the other (Table 2). The latter corresponds with the study conducted in Nigeria, which found a non-significant relationship between knowledge level and practice level of handwashing (Aigbiremolen *et al.* 2015). However, a study conducted in Lakhnaw, India, found a significant relationship between the educational level of mothers and good handwashing practices (Shukla & Agarwal 2016).

The socio-demographic profile of the participants indicates that a majority is older than 20 years, non-Hindu, non-Brahmin, and possesses a basic level of education. These findings resonate with research conducted in Nepal, where socio-economic

status and educational attainment have been linked to health behaviours. For instance, Ghimire *et al.* (2021) and Devkota *et al.* (2020) found that maternal education significantly influenced child health outcomes and hygiene practices, mirroring our results, were higher education levels correlated with improved child health. This indicates that educational interventions targeting mothers could serve as a pivotal strategy for enhancing both hygiene practices and overall health.

Notably, the analysis revealed a significant association between family income and handwashing practices, with lower-income families demonstrating higher hygiene behaviour. Mothers with a monthly income of ≤10,000 NPRs were significantly more likely to practice handwashing compared with those with >10,000 incomes. Several possible explanations could account for this observation. First, lower-income households may be more frequently targeted by public health campaigns, community-based hygiene education, and/or Non Government Organization (NGO) interventions that emphasize the importance of handwashing. These programmes often focus on marginalized or economically disadvantaged groups, leading to greater awareness and adoption of practices like handwashing among lower-income mothers. Another reason could be perceived vulnerability to illness. Mothers with lower incomes may perceive themselves and their families as more vulnerable to infectious diseases due to limited access to healthcare or poorer living conditions. This heightened awareness of risk could motivate stricter adherence to preventive measures such as handwashing. This finding contradicts the global literature, which emphasizes that economic constraints severely limit access to basic hygiene resources (Fisher *et al.* 2019). In slum environments, where households often struggle with insufficient water supply and a lack of soap, the responsibility of maintaining hygiene falls disproportionately on the shoulders of mothers. Addressing these systemic issues, therefore, requires not just educational initiatives but also infrastructural support to enhance water and soap availability. In terms of child health, the study found that 73.2% of respondents reported their children experienced health issues in the past 6 months, with diarrhoea being the most common ailment. This is particularly concerning given the known link between poor hand hygiene and gastrointestinal diseases, which disproportionately affect children under five. Research conducted in similar settings highlights that improving hygiene practices can lead to significant reductions in child morbidity (Coffey *et al.* 2016).

STRENGTHS AND LIMITATIONS OF THE STUDY

This study is the first of its kind in Nepal, conducting statistical analysis considering handwashing knowledge and practices among lactating mothers in two slum communities in Nepal. One limitation is that the study was conducted in just two slum settlements in the capital. So, the results might not be generalizable to a larger population. Another limitation might be the small sample size, which focused on handwashing knowledge and practices with lactating mothers and disease occurrences in their under-5-year-old children; however, there might be several other causes for disease prevalence that need to be resolved in a follow-up study.

CONCLUSION

The study highlights significant associations between maternal demographic factors and handwashing practices, as well as child health outcomes in slum communities. Age and family income were found to be strongly linked to handwashing. Although younger mothers exhibited better handwashing practices (56.7%) compared with mothers over 20 (24.4%), this was not statistically significant ($p = 0.08$). Poorer mothers with a monthly income of ≤10,000 NPRs demonstrated better handwashing practices (52.8%) than those with higher incomes (28.3%), $p < 0.01$. The result denotes that income alone does not necessarily predict better hygiene practices such as handwashing. Instead, contextual factors such as targeted health education, perceived risk, and cultural norms may play a more significant role in influencing behaviour. Public health interventions should not assume that higher-income groups inherently practice better hygiene; instead, they should prioritize equitable education and awareness campaigns across all socio-economic strata. Along with these, factors such as religion, maternal education, and knowledge of handwashing with soap did not show significant associations with handwashing practices, indicating no substantial differences based on these variables.

Regarding child health, maternal education emerged as a key factor influencing child illness. Mothers with basic education (grades 1–8) reported a higher incidence of child illness (81.3%) compared with those with secondary education (grades 9–12, 55.5%), $p < 0.001$. Children of mothers with basic education were 26% more likely to fall ill. In contrast, variables like maternal age, ethnicity, occupation, and family income were not significantly associated with child illness, suggesting limited roles in determining health outcomes. These findings underscore the importance of public health interventions that need to

prioritize toddler mothers, low-income families, and those with lower educational attainment to improve handwashing practices and reduce childhood illness in slum communities.

The findings of this research are expected to contribute to a better understanding of the hygiene knowledge and practices of breastfeeding mothers in slums by targeting this vulnerable demographic. The study seeks to identify critical areas for educational and policy initiatives that align with the Sustainable Development Goals (SDG) 4 relating to health and well-being and SDG 6, considering clean water and sanitation. Improving hygiene practices among mothers is essential for reducing child mortality and morbidity, thereby fostering a healthier future generation in Nepal (Mara & Evans 2018; Shrestha *et al.* 2023).

DATA AVAILABILITY STATEMENT

All relevant data are included in the paper or its Supplementary Information.

CONFLICT OF INTEREST

The authors declare there is no conflict.

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