

Knowledge, Attitude and Practice Assessment of Hand and Oral Hygiene among Primary School Children in Rural Muzaffarpur**Padma Panni¹, Puja Kumari², Ranjeet Kumar³, Kumar Pushpanshu⁴**¹Senior Resident, Department of Dentistry, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar, India²Senior Resident, Department of Dentistry, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar, India³Senior Resident, Department of Dentistry, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar, India⁴Associate Professor, Department of Dentistry, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar, India

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Abstract**Background:** Proper hand hygiene and oral hygiene are essential to prevent infectious diseases and dental disease among children. In rural areas, poor health outcomes are largely attributed to unawareness and a lack of proper practices.**Methods:** This cross-sectional observational study was conducted among 96 rural school children aged between 6 and 12 years in Muzaffarpur, Bihar, from July 2023 to September 2025. A structured questionnaire was used to collect data on Knowledge, Attitude, and Practices (KAP). Descriptive statistics and Chi-square tests were conducted for analysis.**Results:** The study found that 75% of participants knew the importance of handwashing, and an overwhelming 70.8% about brushing two times daily. This satisfactory attitude was not compensated by action only 55.2% of the study population had regularly practised oral hygiene and handwashing practices were reported to be between 60 and 65%. There was a strong association between knowledge and hygiene practices ($p < 0.05$).**Conclusion:** Despite a satisfactory level of knowledge and attitude regarding hygiene, a discrepancy was found in the regular execution of correct practices. This study illustrates the need for targeted measures of education and hygiene provision able to improve health outcomes in rural school children.**Keywords:** Hand hygiene, Oral hygiene, Knowledge Attitude Practice, School children, Rural health, Muzaffarpur.**DOI:** 10.25258/ijcpr.18.8.329

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Introduction

Hygiene is important, especially among children; it helps prevent illnesses and improves their general health status [1]. Proper handwashing using soap is counted as the most cost-effective and high-impact intervention to prevent infectious diseases, especially gastrointestinal and respiratory infections [2]. Brushing teeth regularly prevents dental caries and periodontal diseases along with their complications. These practices are particularly critical in primary school children because they are at a stage where health behaviours that tend to persist into adulthood develop [3]. Many poor hygiene habits adopted in childhood carry on into adulthood and increase the risk of preventable diseases.

In rural areas of India, the burden of poor hand hygiene is directly associated with a high incidence of diarrheal diseases and respiratory infections, which are among the top contributors to morbidity in children [4]. Moreover, poor oral hygiene leads to a higher prevalence of dental caries, gum diseases and oral infections that may adversely affect nutrition school attendance and quality of life [5]. Low socioeconomic status, limited access to sanitation and clean water, as well as low awareness among people are also contributing factors to the already serious situation in a rural context [6].

One strategy that has shown the potential to improve the health outcomes of children is school-

based hygiene education [7]. Schools are an excellent venue for knowledge sharing, behaviours and healthy practices [8]. Teachers and school health programs can help to flesh out children's behavior by encouraging regular hand washing, clean teeth brushing, and cleanliness [9]. Furthermore, children serve as catalysts of change when the knowledge gained transfers to their families and communities, maximizing the effects of these interventions.

There are still gaps in both awareness of hygiene and practice of it, especially among rural populations despite various national and regional health initiatives [10,11]. Or, some children may not have a comprehensive understanding of how often they should wash their hands or brush their teeth [12]. Even when there is awareness, it might not convert into appropriate practices due to behavioral, cultural or infrastructure barriers. Misconceptions and the absence of reinforcement and direct supervision lead to noncompliance with hygiene among school-age children in rural areas [13].

The setting of rural, mainly Muzaffarpur in Bihar, therefore a relevant place to explore these questions. With limited access to sanitation, healthcare and health education, children in the region are at risk of hygiene-related diseases. To identify gaps and tailor interventions, it is important to understand the KAP of primary school children in this region. Such data will help policymakers, educators and healthcare professionals devise effective, community-specific strategies to improve hygiene behaviours and the health of children.

Objectives

- To assess the KAP of hand and oral hygiene.
- To find knowledge gaps in hygiene
- Evaluate the association between knowledge and practice

Materials and Methods

Study Design: This study was done as a cross-sectional observational study to evaluate the KAP associated with hand and oral hygiene among primary school children. A cross-sectional design was selected to enable assessment of the variables of interest at one point in time and is appropriate for establishing levels of awareness and behavior among a specific population.

Study Setting: The study was conducted in selected primary schools of rural areas in Muzaffarpur district, Bihar. The schools are mostly attended by children from lower and middle-income families, where hygiene-related resources and knowledge related to health may be limited.

Study Duration: The study was conducted a period from July 2023 to September 2025. This period encompassed phases of planning, data collection and data analysis.

Study Population: The study population were primary school children (around 6-12 years of age) included in selected rural schools of Muzaffarpur. This period was chosen because it is seen as an important time to develop and strengthen hygiene-related behaviors.

Sample Size: A total of 96 students were included in the study. The sample size was based on feasibility and the number of eligible patients available throughout the study period.

Sampling Technique: In the study, a method of simple random sampling was used to select participants from a pool of eligible students. Lists of enrolled student names were obtained from each school and used to randomly select participants, ensuring that the sampling was unbiased.

Inclusion Criteria

- Attending the chosen primary schools
- Available at time of data capture
- Informed consent given by parents or guardians

Exclusion Criteria

- Not present during the data collection period
- Refused consent or whose guardians refused to participate

Data Collection Tool: A pre-tested, structured questionnaire was used to collect the data for this study. The questionnaire had three sections on KAP regarding hand and oral hygiene.

- The knowledge aspect included questions regarding the importance of handwashing, proper handwashing techniques, how often to brush teeth and the causes of oral diseases.
- The attitude section assessed students' beliefs, perceptions, and intention to use appropriate hygiene practices.
- The practice subscale examined actual behaviors, namely how often washing hands and using soap, and the regularity of brushing teeth.

The questionnaire was administered in a language understandable to the students, with assistance provided where necessary.

Scoring System: Responses were quantified using a scoring system. The knowledge section each correct response received a score of 1, whereas wrong or "don't know" responses scored as zero. The attitude was assessed using a 5-point Likert scale (e.g., strongly agree to strongly disagree) and scores were awarded. Practice was reported using

frequency-based responses (always, sometimes, never) and scored so that a higher score reflects better hygiene practice.

Data Analysis: The obtained data were input and analyzed in SPSS. The data was presented as frequency, percentage or mean. Inferential statistics, mainly the Chi-square test, were employed to analyze associations between KAP. Statistical significance was inferred with $p < 0.05$.

Ethical Considerations: The study was approved by the Institutional Ethics Committee. The school authorities also granted permission before collecting data. Parents or guardians of the participating students provided informed consent.

Participants' anonymity and confidentiality were maintained strictly, and the data collected were only used for research purposes.

Results

A total of 96 primary school children participated in the study. The results are described according to demographic characteristics, hand and oral hygiene KAP.

Demographic Profile: Most of the participants' age ranges were between 8-10 years, followed by those with ages from 6-8 years as well as individuals with ages ranging from 10-12 years. The sample featured 53% male and 47% female participants.

Table 1: Demographic Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Age Group	6–8 years	28	29.2
	8–10 years	40	41.7
	10–12 years	28	29.2
Gender	Male	52	54.2
	Female	44	45.8

Knowledge Assessment: Most of the students were met with handwashing, oral hygiene practices, and knowledge assessment. With respect to certain areas however, there were still gaps.

Table 2: Knowledge Regarding Hand and Oral Hygiene

Knowledge Variable	Yes (n)	Percentage (%)
Aware of importance of handwashing	72	75.0
Knows correct handwashing technique	60	62.5
Aware of brushing teeth twice daily	68	70.8
Aware of causes of dental problems	55	57.3

Overall, 75.0% of participants were aware of the importance of handwashing to prevent dental caries and 70.8% knew that teeth should be brushed at least twice a day. However, only 57.3% knew the causes of dental diseases.

Attitude Assessment: Overall, students' attitudes towards hygiene practices were both positive however, a small proportion of study participants showed indifferent or negative perceptions.

Table 3: Attitude towards Hygiene Practices

Attitude Category	Frequency (n)	Percentage (%)
Positive	70	72.9
Neutral	16	16.7
Negative	10	10.4

Thus, 72.9% of the students reported a positive attitude toward hygiene because they were willing to practice health care as much as possible.

Practice Assessment: While knowledge and attitude were relatively good, hygiene practices varied greatly between participants.

Table 4 Hygiene Practices among Participants

Practice Variable	Always (%)	Sometimes (%)	Never (%)
Handwashing before meals	60.4	30.2	9.4
Handwashing after using toilet	65.6	25.0	9.4
Brushing teeth twice daily	55.2	32.3	12.5

Although 65.6% of students reported that they always washed their hands after using the toilet, only 55.2% reported brushing their teeth twice daily.

Association Analysis: A chi-square test was performed to assess the association between knowledge and hygiene practices.

Table 5: Association between Knowledge and Practice

Knowledge Level	Good Practice (n)	Poor Practice (n)	Total	p-value
Adequate	50	15	65	
Inadequate	12	19	31	0.02*

A significant association, $p < 0.05$ was found between knowledge and practice, which showed that students with good knowledge were more likely to have good hygiene. In conclusion, findings show that participants had a relatively satisfactory knowledge and attitude concerning hand and oral hygiene; however, there was an obvious gap in adherence to effective hygiene behavior.

Discussion

Interpretation of Key Findings: The present study assessed the KAP regarding hand and oral hygiene among primary school children in rural Muzaffarpur. Results suggested that while most students had a general understanding of hygiene attitudes, there remained a significant discrepancy between attitude and actual behavior. Around 75 % of the individuals showed clinical knowledge about the significance of hand washing and the same number understood notion of brushing teeth two times daily. But they did not universally practice consistent hygiene, like washing hands before every meal and brushing twice a day. This highlights a critical discrepancy between awareness and behavioral execution.

Comparison with Previous Studies: The findings of this study are consistent with similar studies conducted in rural areas of India. A few regional studies conducted among school children in states like Uttar Pradesh and West Bengal have shown knowledge at an intermediate level, but observed hygiene practices as suboptimal [14]. While children learn the basics of how to be hygienic, research suggests they do not always translate this knowledge into regular practice. Furthermore, oral hygiene studies among rural populations indicate high dental caries rates that can be attributed to intermittent brushing and lack of knowledge regarding oral health [15]. Therefore, the present findings are consistent with other evidence showing poor hygiene habits among rural school children.

Possible Reasons for Poor/Good Hygiene Practices: There are some possible reasons for the gaps observed in hygiene practices. Rural schools may have limited access to clean water and sanitation facilities, which can prevent regular handwashing. Because of socioeconomic constraints, their hygiene products, such as soap and toothpaste, are inaccessible. Similarly, cultural beliefs and the absence of parental oversight also add to the inconsistent practices. In this context, the relatively good level of knowledge among participants can be due to school-based awareness

programs and basic health education exposure through media and community programs.

Role of Education, Parents, and Schools: Hygiene education is critical in programming hygiene behaviors in children. Schools are an effective setting for the dissemination of health-related knowledge and shaping attitudes. Good practices modeled regularly (and repetitively) can help. Parents also play a crucial role at home, promoting hygiene and helping to keep their children to lifestyle practices such as washing hands regularly and brushing on a daily basis. Thus, an integrated guide is required that can join schools with families and connect theory to practice.

Public Health Implications: The results of this study have important public health implications. Children who practice poor hygiene are more likely to contract infectious diseases, become sick, experience absenteeism from school days, or suffer long-term health consequences like dental problems. In low-resource communities, there is the opportunity to reduce morbidity and mortality associated with preventable diseases by improving hygiene behaviors using targeted approaches. The analysis highlights the importance of integrated hygiene promotion programs targeting knowledge and behavior.

Conclusion

In this study conducted in rural Muzaffarpur, the knowledge and attitude of primary school children regarding hand and oral hygiene were assessed, highlighting that overall, they had a moderate level of knowledge and positive attitudes. However, there is still a large gap between knowledge and practice and many students do not follow recommended hygiene behaviours consistently. These results highlight that knowledge alone is insufficient for good hygiene practices. Urgent need for structured behaviour-change interventions, frequent reinforcement and improved access of hygiene facilities are required. Therefore, optimizing school-based education, complemented by active parental engagement, remains one of the first priorities to ensure sustainable hygiene practices among children while improving health and well-being.

Recommendations: It is suggested that rural primary schools should implement a comprehensive school-based hygiene education, with an emphasis on hands-on experience (e.g.,

demonstrations of handwashing and tooth brushing practice).

Periodic awareness campaigns among teachers, health care workers and community leaders can encourage desirable behaviors. Even regular hygiene practices at home rely on robust engagement from parents. Schools must also have some basic infrastructure like clean water, soap and sanitation facilities. Frequent health checkups and monitoring can also be a way to detect hygiene-related diseases at an early stage, and reinforce positive behaviours in children.

Limitations

However, there are limitations to this study that should be considered when interpreting the results. It will also be noted that the sample size (n=96) was relatively small and as such, findings may not extend to a larger population. Finally, the study was done in a single rural setting at Muzaffarpur which may not be representative of other regions with different sociodemographic or cultural backgrounds. Such data were self-reported and may have been subject to recall or social desirability bias. In addition to that, the cross-sectional design does not adequately define causal relations for knowledge, attitude and practices.

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