

Knowledge, Attitudes, and Practices Regarding Basic Infection Prevention and Control Measures among Healthcare Workers in Divisional Hospitals in Colombo District, Sri Lanka: A Cross-Sectional Study

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ABSTRACT

Background: Healthcare workers are at increased occupational risk of exposure to respiratory infectious diseases due to frequent contact with infected patients and healthcare environments. Effective infection prevention and control (IPC) measures remain essential for reducing healthcare-associated transmission and protecting both healthcare workers and patients. While adequate knowledge and positive attitudes are important determinants of preventive behaviour, organizational and environmental factors may influence successful implementation within healthcare settings.

Objective: To assess the knowledge, attitudes, and practices (KAP) regarding basic infection prevention measures among healthcare workers employed in Divisional Hospitals under the Regional Directorate of Health Services, Colombo District, Sri Lanka.

Methods: A descriptive cross-sectional study was conducted among healthcare workers employed in nine Divisional Hospitals within Colombo District. Data were collected using a pre-tested self-administered questionnaire developed through literature review and expert consultation. Descriptive statistics were used to summarize participant characteristics and KAP indicators. Chi-square tests were employed to assess associations between knowledge, attitudes, and preventive practices. Statistical significance was considered at $p < 0.05$.

Results: A total of 469 healthcare workers participated in the study. Most respondents demonstrated satisfactory knowledge regarding infection prevention measures, including hand hygiene (96.8%), mask use (96.8%), and social distancing (90.6%). Positive attitudes toward infection prevention measures were observed, with over 90% agreeing that mask use protects individuals, family members, and communities. Preventive practices were generally satisfactory; however, only 51.8% consistently practiced workplace social distancing. Significant associations were observed between knowledge regarding mask type and mask-wearing practices ($\chi^2 = 134.807$, $p < 0.001$) and between attitudes toward social distancing and distancing practices ($\chi^2 = 84.649$, $p < 0.001$).

Conclusion: Healthcare workers demonstrated satisfactory knowledge and generally positive attitudes regarding infection prevention measures. Nevertheless, important implementation gaps were observed, particularly in workplace social distancing and resource adequacy. Strengthening institutional IPC systems, ensuring adequate resource availability, addressing workplace barriers, and implementing continuous quality improvement interventions are essential to improve sustainable compliance with infection prevention measures.

Keywords: Healthcare workers; Infection prevention and control; Knowledge; Attitudes; Practices; Healthcare-associated infections; Sri Lanka.

INTRODUCTION

Respiratory infectious diseases caused by emerging and re-emerging pathogens continue to pose significant threats to global public health. The emergence of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) highlighted vulnerabilities within healthcare systems and reinforced the critical importance of infection prevention and control (IPC) practices in healthcare environments. Healthcare workers constitute one of the most vulnerable occupational groups due to their frequent exposure to infected patients, contaminated surfaces, and aerosol-generating procedures. Transmission of respiratory pathogens occurs primarily through respiratory droplets, aerosols, direct contact, and contaminated environmental surfaces. Consequently, adherence to basic infection prevention measures including hand hygiene, mask use, respiratory etiquette, environmental sanitation, physical distancing, and appropriate use of personal protective equipment remains fundamental to reducing healthcare-associated transmission. Numerous studies have demonstrated that proper implementation of these measures significantly reduces disease transmission and protects healthcare workers, patients, and communities.

The effectiveness of infection prevention measures depends not only on availability of resources but also on the knowledge, attitudes, and practices of healthcare workers. Knowledge influences understanding of disease transmission and preventive measures, attitudes influence willingness to adopt preventive behaviours, and practices reflect actual implementation of recommended measures. Therefore, assessment of KAP remains an important approach for identifying strengths and gaps within healthcare institutions. Previous studies conducted among healthcare workers in various countries have demonstrated generally satisfactory levels of knowledge regarding infection prevention measures but have also identified substantial variations in attitudes and compliance with recommended practices. Studies have shown that environmental constraints, workload pressures, staffing shortages, and resource limitations often hinder translation of knowledge into sustained preventive behaviours.

In Sri Lanka, limited evidence is available regarding healthcare workers' knowledge, attitudes, and practices related to infection prevention measures within divisional hospital settings. Such institutions provide essential healthcare services to large populations and represent an important component of the national healthcare system. Understanding infection prevention practices within these facilities is therefore important for strengthening healthcare worker safety, improving healthcare quality, and enhancing preparedness for future infectious disease outbreaks.

This study was conducted to assess the knowledge, attitudes, and practices regarding basic infection prevention measures among healthcare workers employed in Divisional Hospitals under the Regional Directorate of Health Services, Colombo District, Sri Lanka.

Objectives

General Objective

To assess the knowledge, attitudes, and practices regarding basic infection prevention measures among healthcare workers employed in Divisional Hospitals under the Regional Directorate of Health Services, Colombo District, Sri Lanka.

Specific Objectives

1. To assess healthcare workers' knowledge regarding basic infection prevention measures.
2. To assess healthcare workers' attitudes toward infection prevention measures.
3. To assess healthcare workers' preventive practices related to infection prevention measures.
4. To evaluate associations between knowledge, attitudes, and preventive practices.
5. To identify implementation gaps that may affect compliance with infection prevention measures.

METHODOLOGY

Study Design: A descriptive cross-sectional study was conducted among healthcare workers employed in Divisional Hospitals under the Regional Directorate of Health Services, Colombo District, Sri Lanka.

Study Setting: The study was conducted in nine Divisional Hospitals located within Colombo District. These institutions provide primary and secondary healthcare services and employ multidisciplinary healthcare teams responsible for direct patient care and healthcare support services.

Study Population: The study population included all categories of healthcare workers, including medical officers, nursing officers, paramedical personnel, supportive staff, and administrative staff employed in the selected hospitals.

Eligibility Criteria

Inclusion Criteria

- Healthcare workers employed for more than one year.
- Staff available during the data collection period.
- Individuals willing to provide informed consent.

Exclusion Criteria

- Staff members on prolonged leave.
- Individuals unavailable during data collection.
- Staff who declined participation.

Sampling Method: A census sampling approach was employed. All eligible healthcare workers within participating institutions were invited to participate in the study.

Data Collection Instrument: Data were collected using a pre-tested self-administered questionnaire developed following an extensive review of published literature and expert consultation. The questionnaire was made available in English, Sinhala, and Tamil languages to facilitate participation.

The instrument included sections assessing:

- Socio-demographic characteristics.
- Knowledge regarding infection prevention measures.
- Attitudes toward infection prevention measures.
- Preventive practices related to infection prevention measures.

Instrument Validation: Content validity was established through expert review involving specialists in infection prevention, public health, epidemiology, and health administration. The questionnaire was pre-tested prior to data collection to assess clarity, relevance, and feasibility.

Data Analysis: Data were entered, cleaned, and analyzed using appropriate statistical software. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize study variables. Chi-square tests were used to assess associations between knowledge, attitudes, and preventive practices. Statistical significance was established at $p < 0.05$.

Ethical Considerations: Ethical approval was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Colombo. Administrative approval was obtained from relevant health authorities and participating hospital administrations. Participation was voluntary, and confidentiality of information was maintained throughout the study.

RESULTS

Socio-demographic Characteristics: A total of 469 healthcare workers participated in the study. Females accounted for 72.9% (n=342) of respondents, while 71.4% (n=336) were aged between 41 and 60 years. Nursing officers represented the largest occupational category (40.3%), followed by supportive staff (27.7%). Nearly half of participants (49.9%) possessed diploma- or degree-level educational qualifications.

Table 1. Socio-demographic Characteristics of Participants (n = 469)

Characteristic	Frequency	Percentage (%)
Female	342	72.9
Age 41–60 years	336	71.4
Nursing officers	189	40.3
Supportive staff	130	27.7
Diploma/Degree holders	234	49.9

Knowledge Regarding Infection Prevention Measures: Knowledge regarding infection prevention measures was generally satisfactory. Hand hygiene and mask use were identified as important preventive measures by 96.8% of respondents. More than 90% recognized social distancing and avoidance of touching the face as important preventive practices.

Attitudes Toward Infection Prevention Measures: Attitudes toward infection prevention measures were predominantly positive. More than 90% of participants agreed that mask use provides protection for themselves, their family members, and the wider community. Most respondents also considered mask use to be a social responsibility. However, only 65.4% strongly agreed that social distancing is an important preventive measure, indicating comparatively lower acceptance of distancing-related interventions.

Table 3. Attitudes Toward Infection Prevention Measures

Statement	Agree/Strongly Agree (%)
Masks protect self	93.5
Masks protect family	92.0
Masks prevent community spread	92.7
Mask use is a social responsibility	94.2
Social distancing is important	65.4

Preventive Practices: Preventive practices were generally satisfactory. More than 80% of respondents reported avoiding handshaking and selecting well-ventilated work environments whenever possible. Nevertheless, implementation gaps were identified. Only 51.8% consistently practiced workplace social distancing. In addition, 52.0% reported purchasing sanitizers using personal funds despite institutional provision mechanisms.

Table 4. Practices Related to Infection Prevention Measures

Practice	Positive Response (%)
Avoid touching face	90.4
Avoid handshaking	83.8
Choosing ventilated areas	79.1
Restrict outdoor visits	64.2
Workplace social distancing	51.8
Use workplace-provided masks	61.8
Personal purchase of sanitizers	52.0

Associations Between Knowledge, Attitudes and Practices: Statistically significant associations were observed between several knowledge, attitude, and practice indicators. Knowledge regarding appropriate mask types demonstrated a strong association with mask-wearing practices ($\chi^2 = 134.807$, $p < 0.001$). Similarly, positive attitudes toward social distancing were significantly associated with distancing practices ($\chi^2 = 84.649$, $p < 0.001$). Knowledge regarding sanitization was also significantly associated with sanitizer utilization practices ($\chi^2 = 41.231$, $p = 0.001$).

Table 5. Associations Between Knowledge, Attitudes and Practices

Association	χ^2 Value	p-value
Knowledge of mask type vs mask practice	134.807	<0.001
Attitude toward social distancing vs practice	84.649	<0.001
Knowledge of sanitization vs sanitizer practice	41.231	0.001

DISCUSSION

This study demonstrated satisfactory knowledge and generally positive attitudes regarding infection prevention measures among healthcare workers employed in Divisional Hospitals in Colombo District. High levels of awareness regarding hand hygiene, mask use, and social distancing are encouraging and reflect the extensive public health education initiatives implemented during recent infectious disease outbreaks.

The findings are broadly consistent with studies conducted in Thailand, Ethiopia, and other international healthcare settings where healthcare workers demonstrated high levels of awareness regarding infection prevention practices. The widespread recognition of hand hygiene and mask use highlights the effectiveness of institutional training programmes and national health promotion efforts. Despite favourable knowledge levels, notable gaps remained. Misconceptions regarding the reuse of N95/KN95 masks indicate persistent deficiencies in technical understanding of personal protective equipment. Similar observations have been reported in studies evaluating infection prevention practices among healthcare workers in both high-income and low- and middle-income countries.

Attitudes toward infection prevention measures were largely positive. Most respondents recognized the protective benefits of mask use for themselves, their families, and the broader community. Such positive attitudes are important because they contribute to behavioural motivation and facilitate adoption of preventive measures. However, a significant gap between knowledge and practice was observed. Although awareness regarding social distancing exceeded 90%, only approximately half of participants consistently practiced workplace social distancing. This discrepancy suggests that organizational and environmental factors may influence implementation more strongly than individual knowledge alone.

Overcrowding, space limitations, workforce shortages, high patient volumes, and competing service priorities may limit healthcare workers' ability to implement recommended preventive practices despite possessing adequate knowledge. These findings align with implementation science frameworks which emphasize that behaviour is influenced by interactions between individual capability, environmental opportunity, and institutional support. Resource-related challenges were also identified. More than one-third of respondents perceived that available masks and sanitizers were inadequate, while many reported purchasing sanitizers using personal funds. Such findings indicate the need for strengthened procurement systems, resource allocation mechanisms, and institutional support structures.

The significant associations observed between knowledge, attitudes, and practices suggest that improved awareness contributes positively to preventive behaviour. Nevertheless, educational interventions alone may be insufficient. Sustainable improvements require a combination of training, supportive supervision, resource strengthening, environmental modifications, and organizational commitment.

Limitations: Several limitations should be considered. First, the use of self-administered questionnaires may have introduced reporting bias and social desirability bias. Second, the cross-sectional study design limits causal inference. Third, direct observational validation of reported practices was not conducted.

Future studies should incorporate structured observational audits among a randomly selected 10–15% sample of healthcare workers to validate self-reported practices. Qualitative approaches, including focus group discussions and key informant interviews, would also provide valuable insights into organizational barriers affecting infection prevention compliance. Furthermore, the study was limited to Divisional Hospitals in Colombo District and may not be fully generalizable to other healthcare settings in Sri Lanka.

CONCLUSIONS

Healthcare workers employed in Divisional Hospitals within Colombo District demonstrated satisfactory knowledge and positive attitudes regarding basic infection prevention measures. High levels of awareness were observed regarding hand hygiene, mask use, and social distancing.

Despite these encouraging findings, important implementation gaps remain. Workplace social distancing practices were suboptimal, and concerns regarding the adequacy of infection prevention resources were reported. These findings indicate that knowledge alone does not guarantee behavioural compliance.

Improving infection prevention performance requires a comprehensive strategy that combines continuous professional education, strengthened institutional support systems, adequate resource provision, supportive supervision, workplace improvements, and ongoing monitoring of compliance. Addressing both behavioural and organizational determinants is essential for strengthening healthcare worker safety and enhancing healthcare system resilience.

RECOMMENDATIONS

1. Strengthen Infection Prevention and Control (IPC) programmes through regular competency-based training, supportive supervision, and routine compliance monitoring.
2. Ensure continuous availability of essential IPC resources, including personal protective equipment, masks, sanitizers, and hand hygiene facilities, while strengthening institutional governance, quality assurance, and accountability mechanisms.
3. Address operational and infrastructural barriers such as overcrowding, workforce shortages, and environmental limitations to improve compliance with recommended infection prevention practices.
4. Promote evidence-based improvement through observational audits, qualitative assessments of implementation barriers, and multicentre research across diverse healthcare settings to guide policy and

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