Research Article ISSN 2768-6647

Medical and Clinical Case Reports

Behaviour Centred Hygiene Intervention and Surface Disinfection Practices in Rural Zambia Kutuba Campaign and Surface Disinfection Practices

Kelvin Kangwa Kakumbi[1]*and Nathan Kamanga[2]

[1]*School of Postgraduate Studies, University of Lusaka, Lusaka, Zambia.*

[2]*Department of Public Health, University of Lusaka, Lusaka, Zambia.*

***Correspondence:**
Kelvin Kangwa Kakumbi, School of Postgraduate Studies, University of Lusaka, Lusaka, Zambia, Tel: +260978285940.

Received: 21 Apr 2026; **Accepted:** 27 May 2026; **Published:** 03 Jun 2026

Citation: Kelvin Kangwa Kakumbi, Nathan Kamanga. Behaviour Centred Hygiene Intervention and Surface Disinfection Practices in Rural Zambia Kutuba Campaign and Surface Disinfection Practices. Med Clin Case Rep. 2026; 6(2): 1-4.

ABSTRACT

Background: *Environmental contamination within healthcare facilities contributes significantly to healthcare-associated infections and the transmission of infectious diseases, particularly in low resource healthcare settings. Effective environmental cleaning and surface disinfection are critical components of infection prevention and control systems. The Kutuba campaign was implemented in selected districts in Zambia to promote sustainable hygiene behaviour change using a behaviour centred approach.*

Objective: *To determine whether healthcare workers exposed to the Kutuba campaign demonstrated improved cleaning and surface disinfection practices compared to healthcare workers in facilities not exposed to the campaign.*

Methods: A comparative quantitative study was conducted among healthcare workers from 24 healthcare facilities in Monze District, Zambia. Twelve facilities had implemented the Kutuba campaign while twelve had not. Data was collected from 58 respondents using semi-structured questionnaires. Statistical analysis was conducted using STATA version 14.0. Two-sample tests of proportions, chi-square tests, Fisher's exact tests, risk ratios, and odds ratios were used to assess differences in surface cleaning and disinfection practices between exposed and non-exposed groups.

Results: *Among healthcare workers exposed to the Kutuba campaign, 55.0% reported cleaning and disinfecting surfaces at least three times daily compared to 34.2% among non-exposed respondents. The difference in proportions was 20.8%; however, the difference was not statistically significant (p=0.127). Healthcare workers exposed to the campaign had higher odds of frequent surface cleaning and disinfection compared to non-exposed workers (OR=2.35; 95% CI: 0.78–7.11). The risk ratio for frequent surface cleaning among exposed respondents was 1.61.*

Conclusion: *Although statistically significant differences were not observed, healthcare workers exposed to the Kutuba campaign demonstrated higher odds of practicing frequent surface cleaning and disinfection. Behaviour-centred hygiene interventions may contribute to strengthening infection prevention and control practices when integrated with broader environmental hygiene and healthcare systems strengthening interventions.*

Keywords
Behaviour change, Environmental hygiene, Global health security, Infection prevention and control, Surface disinfection.

Introduction
Healthcare associated infections remain a major public health challenge globally and contribute substantially to patient morbidity, mortality, prolonged hospital stays, and increased healthcare costs. Environmental contamination within healthcare facilities is recognized as an important pathway for the transmission of infectious pathogens, particularly in low-resource healthcare settings where infection prevention and control systems are often inadequately resourced [1-3].

Frequently touched surfaces in healthcare facilities can act as reservoirs for pathogenic microorganisms and contribute to healthcare-associated infections when cleaning and disinfection practices are insufficient. Effective environmental cleaning and surface disinfection therefore represent critical components of infection prevention and control programs and broader health systems preparedness for infectious disease outbreaks [1,3].

The importance of environmental hygiene became increasingly evident during the COVID-19 pandemic, which highlighted major gaps in healthcare facility preparedness and infection prevention systems globally. International guidelines from the World Health Organization and the Centers for Disease Control and Prevention emphasize that regular environmental cleaning and disinfection are essential strategies for reducing pathogen transmission in healthcare settings [1,2,4].

In many low- and middle-income countries, hygiene promotion programs have historically focused on knowledge transfer approaches such as Community-Led Total Sanitation and Participatory Hygiene and Sanitation Transformation. While these approaches have contributed to improved awareness regarding hygiene practices, evidence suggests that knowledge alone is often insufficient to sustain long-term behaviour change [5-7].

To address these limitations, the Kutuba campaign was implemented under the Resolution to Revolution project in Zambia using a behaviour-centred ABCDE framework consisting of Assess, Build, Create, Deliver, and Evaluate phases. The campaign aimed to strengthen sustainable hygiene behaviours among healthcare workers and surrounding communities by addressing behavioural drivers, enabling environments, and social norms influencing hygiene practices [6,7].

Although behaviour-centred interventions have shown potential in improving hygiene-related practices, evidence regarding their effectiveness in strengthening environmental cleaning and surface disinfection practices in healthcare facilities remains limited in sub-Saharan Africa [6,8,9]. This study therefore assessed whether exposure to the Kutuba campaign influenced the frequency of cleaning and disinfecting surfaces among healthcare workers in rural healthcare facilities in Monze District, Zambia.

Materials and Methods

Study Design

A comparative quantitative study design was employed to assess differences in environmental cleaning and surface disinfection practices between healthcare workers exposed to the Kutuba campaign and those not exposed to the intervention. Comparative quantitative designs are widely used in public health and epidemiological research to assess differences between exposed and non-exposed populations where randomized allocation is not feasible [10,11].

Study Setting

The study was conducted in Monze District in Southern Province, Zambia. The district was among the implementation sites for the Resolution to Revolution project, under which the Kutuba campaign had been implemented for approximately two years before data collection.

Study Population

The study population consisted of healthcare workers from selected healthcare facilities in Monze District. Participants included facility staff involved in routine infection prevention and environmental hygiene practices.

Sample Size and Sampling Procedure

A total of 58 healthcare workers participated in the study. Twenty-seven respondents were recruited from healthcare facilities where the Kutuba campaign had been implemented, while thirty-one respondents were recruited from healthcare facilities where the intervention had not been implemented.

Twenty-four healthcare facilities were included in the study, comprising twelve facilities exposed to the intervention and twelve facilities not exposed to the intervention. Purposive total population sampling was used to recruit healthcare workers available during the data collection period. Total population sampling is considered appropriate in studies involving relatively small and accessible target populations where inclusion of all available participants improves representativeness and reduces sampling bias [12].

Data Collection

Data were collected using semi-structured questionnaires administered electronically using Kobo Toolbox. Semi-structured questionnaires are commonly used in healthcare and behavioural research because they allow standardized data collection while maintaining flexibility to capture contextual information relevant to participant experiences and practices [13]. Information collected included frequency of cleaning and disinfecting surfaces at points of care, cleaning materials used, and availability of institutional support for environmental hygiene practices.

For analysis, cleaning frequency responses were categorized into:

- cleaning surfaces less than three times per day.
- cleaning surfaces at least three times per day.

Data Analysis

Data were analysed using STATA version 14.0. Descriptive statistics were used to summarize participant responses. Two-sample tests of proportions were conducted to compare differences between exposed and non-exposed groups. Chi-square tests and Fisher's exact tests were used to assess statistical associations. Measures of effect were estimated using risk ratios and odds ratios with 95% confidence intervals. Statistical significance was assessed at $p<0.05$. The use of odds ratios, risk ratios, and chi-square tests is well established in epidemiological and public health studies for assessing associations between exposures and behavioural outcomes [11,14].

Ethical Considerations

Ethical approval for the study was obtained from the relevant institutional ethics review authority before commencement of data collection. Permission to conduct the study was also obtained from district health authorities and participating healthcare facilities. Written informed consent was obtained from all participants prior to data collection, and confidentiality of participant information was maintained throughout the study.

Results

Characteristics of Study Participants

A total of 58 healthcare workers participated in the study, including 27 respondents from healthcare facilities exposed to the Kutuba campaign and 31 respondents from facilities not exposed to the campaign.

Surface Cleaning and Disinfection Practices

Among respondents not exposed to the Kutuba campaign, 65.8% reported cleaning and disinfecting surfaces less than three times daily, while 34.2% reported cleaning surfaces at least three times daily.

Among respondents exposed to the Kutuba campaign, 45.0% reported cleaning and disinfecting surfaces less than three times daily, while 55.0% reported cleaning surfaces at least three times daily.

Healthcare workers exposed to the Kutuba campaign therefore demonstrated higher reported frequency of surface cleaning and disinfection compared to non-exposed respondents.

The difference in proportions between exposed and non-exposed groups was 20.8%. However, the two-sample test of proportions demonstrated that the observed difference was not statistically significant (p=0.127).

Similarly, chi-square and Fisher's exact tests did not demonstrate statistically significant associations between exposure to the Kutuba campaign and frequent surface cleaning practices.

The estimated risk ratio for frequent surface cleaning among exposed respondents was 1.61, indicating that healthcare workers exposed to the intervention were more likely to practice frequent surface disinfection compared to non-exposed respondents.

The odds ratio for frequent surface cleaning among exposed respondents was 2.35 (95% CI: 0.78–7.11), suggesting increased odds of practicing regular environmental cleaning among healthcare workers exposed to the Kutuba campaign.

Table 1: Surface Cleaning and Disinfection Practices Among Healthcare Workers.

Frequency of Surface Cleaning	Non-Exposed n (%)	Exposed n (%)
Less than 3 times daily	65.8	45.0
At least 3 times daily	34.2	55.0

Discussion

This study assessed whether exposure to the Kutuba behaviour-centred hygiene campaign influenced environmental cleaning and surface disinfection practices among healthcare workers in rural healthcare facilities in Zambia.

The findings demonstrated that healthcare workers exposed to the intervention reported higher frequencies of surface cleaning and disinfection compared to healthcare workers not exposed to the intervention. Although the observed differences did not achieve statistical significance, the direction of effect measures suggests a potentially positive influence of the intervention on environmental hygiene practices.

Environmental cleaning and disinfection are widely recognized as essential components of infection prevention and control systems because contaminated healthcare surfaces can serve as reservoirs for pathogenic microorganisms responsible for healthcare-associated infections [1-3]. The increased proportion of frequent surface cleaning among exposed healthcare workers therefore suggests that behaviour-centred hygiene interventions may positively influence environmental hygiene behaviours in healthcare settings.

The findings are consistent with evidence indicating that sustainable hygiene improvement requires approaches that move beyond traditional knowledge-transfer models and instead address behavioural drivers, enabling environments, social norms, and institutional support systems [5-8].

The odds ratio observed in this study indicated that healthcare workers exposed to the Kutuba campaign were more than twice as likely to report frequent surface cleaning and disinfection practices compared to healthcare workers not exposed to the intervention. Although the confidence interval crossed unity and statistical significance was not achieved, the positive trend may indicate emerging intervention effects that could become more pronounced with larger sample sizes, longer implementation periods, or stronger institutional support mechanisms.

The absence of statistically significant findings may partly be explained by limitations in healthcare facility infrastructure and availability of environmental cleaning resources. Effective environmental hygiene interventions typically require multimodal implementation approaches that integrate behaviour change communication with consistent availability of disinfectants, cleaning supplies, supervision systems, institutional infection prevention programs, and leadership support [1,2,4,15].

The findings also align with recommendations from international infection prevention and control guidelines emphasizing that environmental hygiene programs are most effective when integrated into broader healthcare systems strengthening initiatives [1,2,15].

This study had several limitations. First, the relatively small sample size may have reduced statistical power to detect

significant differences between study groups. Second, self-reported cleaning practices may have introduced reporting bias. Third, the comparative cross-sectional design limits causal inference regarding the direct effect of the intervention.

Despite these limitations, the study provides important evidence regarding the potential contribution of behaviour-centred hygiene interventions toward strengthening environmental cleaning practices in low-resource healthcare settings. Future studies should consider longitudinal designs, larger sample sizes, and direct observational assessment of environmental cleaning practices.

Conclusion

Healthcare workers exposed to the Kutuba campaign demonstrated higher reported frequencies and increased odds of practicing regular surface cleaning and disinfection compared to healthcare workers not exposed to the intervention. Although statistically significant differences were not observed, the findings suggest that behaviour-centred hygiene interventions may contribute positively toward strengthening infection prevention and control practices in rural healthcare facilities.

Integrating behaviour-centred hygiene interventions with broader healthcare systems strengthening strategies, including improved access to cleaning supplies, institutional infection prevention programs, and environmental hygiene infrastructure, may further enhance the effectiveness of environmental cleaning interventions in resource-limited settings.

Acknowledgements

The authors acknowledge the University of Lusaka, participating healthcare workers, Monze District Health Office, and healthcare facilities that supported the implementation of this study. Special acknowledgment goes to WaterAid Zambia for having implemented the Resolution to Revolution project (R2R) through which the Kutuba campaign was implemented. On Call Africa for working with WaterAid on the R2R project.

References

1. CDC and ICAN. Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings. Atlanta: US Department of Health and Human Services. 2019.
2. World Health Organization. Framework and Toolkit for Infection Prevention and Control Outbreak Preparedness, Readiness and Response at the National Level. Geneva: WHO. 2021.
3. Jennifer H, Nancy S, Brian F, et al. Cleaning Hospital Room Surfaces to Prevent Health Care–Associated Infections. Ann Intern Med. 2015; 163: 598-607.
4. World Health Organization. Water, Sanitation and Hygiene in Health-Care Facilities: A Practical Tool for Situation Assessment and Improvement Planning. Copenhagen: WHO Regional Office for Europe. 2002.
5. White S, Thorseth HA, Dreibelbis R, et al. The determinants of handwashing behaviour in domestic settings: an integrative systematic review. Int J Hyg Environ Health. 2020; 227: 113512.
6. Williamson K, Bujold PM, Thulin E. Behavior Change Interventions in Practice: A Synthesis of Criteria, Approaches, Case Studies and Indicators. Rare Center for Behavior and the Environment. 2020.
7. Gautam O, Crichton-Smith H. A systems strengthening approach to improve hygiene behaviours. WaterAid. 2018.
8. Sophie S, Nicolas M, Moctar O, et al. Behavior Change After 20 Months of a Radio Campaign Addressing Key Lifesaving Family Behaviors for Child Survival: Midline Results From a Cluster Randomized Trial in Rural Burkina Faso. Glob Health Sci Pract. 2015; 3: 557-576.
9. Stephen S, Emmanuel A, Cortland L, et al. Impact of a Novel, Low-Cost and Sustainable Health Education Program on the Knowledge, Attitudes, and Practices Related to Intestinal Schistosomiasis in School Children in a Hard-to-Reach District of Madagascar. Am J Trop Med Hyg. 2022; 106: 685-694.
10. Shy CM. Epidemiology 160/600 Introduction to Epidemiology for Public Health Course Lectures. Chapel Hill: The University of North Carolina Department of Epidemiology. 2001.
11. Newell C. Methods and Models in Demography. New York: The Guilford Press; 1988.
12. Lund Research Ltd. Total Population Sampling. Laerd Dissertation. 2012.
13. Jenkins M, Freeman M, Routray P. Measuring the safety of excreta disposal behavior in India with the new Safe San Index: reliability, validity and utility. Int J Environ Res Public Health. 2014; 11: 8319-8346.
14. Bakyaita N, Mweemba N. Universal Health Coverage: A Perspective of the WHO Country Office in Zambia. Health Press Zambia Bulletin. 2018; 2: 5-16.
15. Tahir A, Ikram A, Chaudhry T, et al. Assessment of Infection Prevention and Control Implementation and Strategies Used for IPC Preparedness at Facility Level in Underdeveloped Areas of Pakistan. Infect Drug Resist. 2023; 4: 1997-2006.