Original Research

Implementing and Evaluating Ward Cleanliness in an Acute Care Setting at a Referral Hospital: an Evidence-based Practice Project

Malawi Journal of Nursing and Midwifery

For volume 1, issue 1, published 2026

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Dates

Received: May 19, 2025

Accepted: May 18, 2026

Published: August 31, 2026

Abstract

INTRODUCTION: Environmental cleanliness is important for controlling infection. A male medical ward was identified to implement best practice for ward cleaning. The interventions were based on the WHO guidelines and focused on cleaning ward surfaces, sluice room, toilets and equipment.

Methods: A mixed method was conducted using the Plan DO Study Act model. Data were collected through audits, observations, documentary analysis, focus groups and semi-structured interviews. NVivo 12 was used to handle the qualitative data. Quantitative data was managed using Excel.

Results: A baseline audit consisting of 15 criteria for ward cleanliness and the use of protocols demonstrated that no protocols were used. An evidence based ward cleaning protocol was developed and implemented. Following the intervention, ward cleaning was evaluated on 5 separate occasions, using the original audit criteria. Thirteen attributes relating to the presence of protocols and their use scored 100%, two attributes related to the process of escalation if protocols were not followed, and presence of training on ward cleanliness scored 60% respectively. Using the Medical Research Council evaluation framework; we identified three themes from qualitative data: Changes to practice, boundaries and frameworks; changes to ward ethos and environment; and system challenges.

Conclusion: The implementation of the ward cleaning protocol has provided insight into the complexities of improving care. The intervention proved successful and can be attributed to training, supervision and the involvement of ward cleaners and patient guardians.

Originality: Implementing evidence based change in a country with limited resources is highly complex. This project demonstrates successful change through the involvement of ward cleaners and guardians in the process of achieving ward cleanliness. It highlights successful collaboration between academics and clinical practitioners and the involvement of stakeholders in implementing evidence based practice.

Keywords: Ward cleaning protocols, acute ward, evidence based practice, nurses, cleaners, patient guardians.

Introduction

Data from 78 low and middle-income countries showed that half of 129,557 health care facilities lacked access to piped water, 33% did not have an improved toilet (WHO & UNICEF,2015). In 2020, WHO and UNICEF proposed standardized Water, Sanitation and Hygiene (WASH) indicators (Atzatzev, 2020). Despite these advancements, there remain gaps regarding environmental cleaning, the availability of cleaning policies and protocols, let alone training for cleaners (Elling et al., 2022). This contributes to infection spread.

The lack of proper infection control in health care facilities is a driver for antimicrobial resistance (Dancer, 2014; Holmes et al., 2016). Poor cleaning procedures can increase the risk of health care associated infections, as 15% of all hospitalized patients in LMICs are estimated to acquire an infection during their hospital stay (Elling et al., 2022)

Therefore, WASH principles are vital for providing safe health services, improving patient satisfaction and care (Lopez et al., 2020). The cleaning of any hospital environment must be carried out in a pre-planned, clearly structured and defined manner. Nurses and cleaning staff are key in this role and require training and regular updates (Elling et al., 2022). Nurses play a vital role in infection prevention (Mitchell et al., 2021).

Cleaners are the primary personnel responsible for ensuring safe health conditions for patients and staff, yet there is little evidence describing their roles (Elling et al., 2022). Cleaners are responsible for dusting, mopping, disinfecting doors, floors, and surfaces, disposing off and treating infectious waste (Cross et al., 2019).

The aim of this project was to improve ward cleanliness with the overall purpose of assessing compliance with best practice recommendations, identify barriers and facilitators to change and improve adherence to best practice. This aligns to UN Sustainable Development Goals 3, 10 and 17 focusing on improving health and wellbeing for patients.

Materials and Methods

Design: This was a pre- and post-intervention mixed methods quality improvement project conducted for seven months from March 2021 to September 2021.

Setting: The Kamuzu University of Health Sciences (KUHeS) and the School of Healthcare Sciences Cardiff University (SoHCS) worked collaboratively to improve the cleanliness of a male medical ward at a referral hospital using current evidence. Initial assessment of the ward showed overcrowding with patients on mattresses on the floor. Some of the sinks on the ward had no running water and cleanliness was poor. Cleaning responsibilities were not clear between nurses and cleaners, and no standardized cleaning protocol was in place.

Ethical approval: Ethical permission was sought from College of Medicine Research Ethics Committee (COMREC No.09/20/3134.).

Methods and study population: The Plan, Do, Study, Act (PDSA) model for quality improvement was used to implement and evaluate the project. The study population was nurses and cleaners.

Plan - Several areas for improvement were identified by nurses, doctors, pharmacists, laboratory technologists. Ward cleanliness was prioritized and agreed to focus on. An audit tool was developed to gain a baseline data and plan improvements that matched best evidence. The nurse in charge was interviewed on ward cleaning practice using the baseline tool. The results of the audit were analyzed and findings showed no protocols existed for all the 15 audit criteria (Table 1). The project team established a Steering Committee and an Operational Group consisting of staff from KUHeS, SoHCS and hospital clinical nurse leaders. A rapid review of the evidence on ward cleanliness was undertaken and an evidence based protocol for practice developed. The operational group reviewed the protocols and ensured their suitability for use on the Malawian ward. Training of nurses and cleaners took place to address deficits found in the baseline audit and prepare them for implementation of the new protocol.

Do - The protocol was implemented by all 11 permanent nurses (including matron) and part-time nurses and cleaners. In addition, one academic member of the project team provided weekly supportive supervisory and working visits. Ward cleaning protocols were in designated places and kept on file for reference. The operational group observed and analyzed the setting further, including the role of patient guardians in ward cleanliness to identify facilitators and barriers to compliance. Weekly health education sessions on ward cleanliness were extended to patients and guardians. Both steering and operational group meetings were held separately online to report successes, barriers and facilitators and identify solutions. Barriers were reported to hospital management. Staff turnover on the ward was high which necessitated further workshops and continuous ward based training.

Study – The interventions were tested to determine whether any improvements in ward cleanliness were yielded. Post implementation data were collected by a research assistant using the same audit data collection tool that was used in the baseline. Ward cleanliness was evaluated 5 times and audited randomly, at different times of the day to evaluate consistency in implementation. Focus group interviews with cleaners were conducted by the research assistant and the project team conducted online interviews with nurses.

Act – This involved making recommendations based on the findings.

Data Analysis: Quantitative data involved simple counts and conversion to percentages of standard items on ward cleanliness. For example, availability of the protocol for ward cleaning and if implemented against the total number of standard items or attributes. Qualitative data was analyzed using thematic analysis.

Results

Table I shows quantitative results of each attribute before and after implementation.

Table 1: Ward cleanliness pre and post implementation

Attribute	Baseline Audit Results		Post Audit Results	
	Yes (%)	No (%)	Yes (%)	No (%)
Is there a protocol for ward cleaning	0 (0)	1 (100)	5 (100)	0 (0)
Is there a protocol for cleaning surfaces in the ward	0 (0)	1 (100)	5 (100)	0 (0)
Is a protocol for cleaning ward followed	0 (0)	1 (100)	5 (100)	0 (0)
Is there a protocol for cleaning floors in the ward	0 (0)	1 (100)	5 (100)	0 (0)
Is a protocol for cleaning ward floors followed	0 (0)	1 (100)	5 (100)	0 (0)
Is there a protocol for cleaning beds/mattresses in the ward	0 (0)	1 (100)	5 (100)	0 (0)
Is a protocol for cleaning ward beds followed	0 (0)	1 (100)	5 (100)	0 (0)
Is there a protocol for clinical waste disposal	0 (0)	1 (100)	5 (100)	0 (0)
Is a protocol for clinical waste disposal followed	0 (0)	1 (100)	5 (100)	0 (0)
Is there a protocol for cleaning spillage of blood and bodily fluids	0 (0)	1 (100)	5 (100)	0 (0)
Is a protocol for cleaning spillage of blood and bodily fluids followed	0 (0)	1 (100)	5 (100)	0 (0)
Is there a protocol for cleaning ward equipment	0 (0)	1 (100)	5 (100)	0 (0)
Is the protocol for cleaning ward equipment followed	0 (0)	1 (100)	5 (100)	0 (0)
Is there a process for escalation if protocols have not been followed?	0 (0)	1 (100)	3 (60)	1 (20)
Is there a training program in place for staff relating to ward cleanliness and safe disposal of waste	0 (100)	1 (100)	3 (60)	0 (0)

Qualitative data was sourced from four online interviews (IN) with key staff (ward matron, sister in charge, deputy nurse in charge and project academic lead, two face to face focus groups with nurses one focus group with cleaners (n = 6). Using the MRC evaluation framework, the three themes with subthemes were identified.

Theme 1: Changes to practice, boundaries and frameworks

Subtheme i. Improving evidence-based practice: The data highlighted embedding of the protocol into practice using an evidence-based approach. The post implementation data highlighted that prior to implementation there was no protocol in place leading to a lack of standardised cleaning practice

"okay actually I would say the ward was in a mess, for example, the... infection prevention measures were not being followed, people were just doing whatever they were supposing to do." FG1

"We were not following the protocol e.g. starting with Chlorine or soap we were just mopping so the ward kept stinking. Everyone was just getting his or her water and start mopping." FG3

The high turnover of nurses and cleaners meant that a continuous programme of in-service training/CPD was required during the duration of the project.

"and with the experience of having high turnover of nurses of course this time for the past 3 months…… the cleaners they keep changing now and then and we have no control on the issue of turnover of staff both for the cleaners and nurses because as a policy that's what they do in the units and we just have to find ways on how best to have frequent workshops with the nurses and the cleaners. It can be on the bedside, it can be on the ward side, we can at times organize outside the ward. It's one of the motivating factors as well so continuously meeting them." IN 4.

The provision of CPD on the ward increased accessibility for staff to attend. The support of local academic staff helped the project move forward.

"Yes, very much aah a change has been seen because now aah our maids are trained generally the ward cleanliness, how they are supposed to clean up the floors, how the right aah solutions to be used when cleaning the wards and also the right ways of doing it so now they follow that we see a change, when they actually clean the ward you see that this area has been cleaned and this is not been cleaned cause now they are doing the right things cause previously they were doing it anyhow. Also, they have

been given a set of aah procedural manuals on how to do things so now we paste them so they read them so they know what to do now." FG1

Cleaners also appreciated how they are approached by nurses when they do not perform well suggestive of supportive team work:

"At first when we had not done a good job, they would just go straight and report us without talking to us directly. But now when we have made a mistake or maybe we did not clean the ward right, they talk to us directly and advise us on how best we can clean the ward. I see this as a good change." FG3.

Students were also orientated in the ward cleanliness protocols as the data indicates:

"we orient them so that they are aware and embrace and also participate … so we orient them… especially cleaning of the utensils, the beds, dusting is part of the role of students so we orient them to the tools…" IN4

Subtheme ii: Protocol implementation and report of patient satisfaction: Participants stated that patients commented they had seen positive changes since previous admissions to the ward.

"People who were admitted previously before the project started, they are now seeing the changes and they are appreciating the way we are doing the things."IN4

"and we are able to do things according to the project as well as for the betterment of our patient, even the patients themselves are seeing the changes." FG1

Theme 2 Changes to ward ethos and environment

Subtheme i: Clarity of roles and responsibilities: Respondents commented about the benefits of an academic staff working on the ground with clinical staff including the ward matron

"My focal area is the ward cleanliness so am there in the ward on the ground supporting, providing mentorship, encouraging the team to work, based on the protocols that we developed." IN 4

"My involvement is …..I'm responsible for the ward, so, what's so ever is happening in that particular ward I need to be aware and on top of that the moment they were bringing in this concept they approached me, and together we briefed the management." IN 1

Participants also discussed the roles of nurses, guardians and cleaners and how the project had impacted positively on patient health and guardian safety.

"We enforce that no this is not the work of the guardians, whenever something is dirty, whenever the area is not clean the one who is supposed to be cleaning is the one who is trained to do that so that we do prevent the infection." FG1

"The nurses inform the guardians to move their items from the bedside before the cleaners start cleaning and tell them to go out if they can. Those guardians that have serious patients are told to stay inside the ward but should not sit on the bed but should sit on the chair. We also tell the guardians whose patients can walk, that they can wait outside and those who patients can not to look over the patient of the other guardians." FG3

Whilst challenges remained evident, including acutely ill patients and low staffing levels, motivation had improved.

"Before there was no good team work but as of now the nurse and her team were able to work and whenever we have identified problems we are able to discuss in the ward on the bedside , training to mentor the young nurses that are on the ground working on the ward." IN 4

Subtheme ii: Improved prioritization and organization of the ward environment: Ward staff, including the ward cleaners were generally positive about the strategies that had been embedded that led to a positive change in the ethos on the ward. This included closer supervision of cleaners and visibility of the unit matron supporting nurses and cleaners.

"In-charge, unit matron you would find her on the ground on the bed side supporting the cleaners supporting the nurses so prior to that there were no such kind of working relationship." IN 4

"The nurses and in-charges told us that when we have run out of our cleaning chemicals, we should tell them and they will help so that we keep our ward clean and tidy. So when we have run out of chlorine or soap they give us." FG3

Participants made several comments about the improved working environment, for example functioning toilets and ward cleanliness

"On the side of the environment the work environment it has greatly improved you know I will start with the toilets… the nurses they are able to go to the patient toilet see how the cleaners are doing and then appreciate the efforts that are there". IN 4

"the wards are being cleaned thoroughly nowadays and ever since the introduction of three bucket system, aah we can actually see that the ward has been cleaned, because you can actually tell." FG2

"The project should continue because people from the community have started commenting that the ward has

changed. People are saying the ward has started looking hygienic. At first people come in the ward and fail to eat because of the smell in the ward and the status of the toilets." FG3

Subtheme iii: Feeling valued, empowered and teamwork: Valuing the contribution of patients and carers was evident. There was clear involvement of patients and guardians in the project signifying the importance of team work.

"I want to share with you one experience that I have had when I was in the ward supervising cleaners guiding them what to do. There was a patient ……..then he said I am impressed with what you are doing in this ward I have seen you you've taken guardians out and I heard you were talking to them about ward cleanliness and the way you were talking to the cleaners how they should do their mopping". IN 4

Patients and guardians were now taking greater responsibility for keeping the ward clean.

"…… guardians have started listening to our advice. Now we have access to places that guardians would initially put their belongings. Now we have access to all the places and we can clean all the areas. We are trying every day to clean so that they look clean. When the guardians are not keeping the place tidy we inform them." FG3

Subtheme iv: Improved staff morale: Ward staff commented that since the implementation of the project staff morale had improved despite staffing challenges and the impact of COVID taking its toll,

"Actually, personally I feel good, I love my work, I love my colleagues, we always work in team, as a team and now that the environment is clean, I like going to work knowing that I'm safe and also that I'm able to work with the colleagues aah the doctors hand in hand, I feel safe and I feel good yeah." ……"if you ask me the same question in the past three months I wouldn't say I feel okay, because COVID took toll… FG2

"I can say that at first going to work was worrisome. But now when you wake up and going to work, you are confident to go to work and that is a good place." FG3

Theme 3: Continuing challenges

Despite the successes, challenges were reported by nurses and cleaners.

***Subtheme 1: Ward facilities, Staffing and resources*:** Staff reported that some of the early improvements had not continued with problems arising in relation to the broken toilets or lack of essential equipment. Not clear

"Maintenance especially on the toilets, they are in bad condition and the sink and even some taps are not running very well." ….the drip stand the beds most beds are broken they are dirty because they have been used for a very very long time so you would clean the floor you wipe the windows, you would do the dusting but still the ward will not be looking shiny cause of the equipment that you are using right now." FG 1

"Most of our beds are not in good condition." IN 1

"There's always blockages at the toilets, there is water everywhere, that's the first challenge and the second one is aah I think there two wards so they don't operate well, you put in water, the thing don't go they're just there attracting flies and bad smells over the wards or the toilets, so the cleanliness in the toilets is not." FG2

Challenges remained due to ward overcrowding:

"Mmmh, yes, that's the big challenge, cause sometimes we have overflowing of patients and we have to put them on the floor, so even cleaning the ward becomes difficult because you can't move a patient from that place for you to clean it, generally. things get bad when the ward is too full." FG1

Subtheme ii Contract cleaning Service: An ongoing challenge impacting morale was high turnover by the contracted cleaning staff with unreliable income.

"Pertaining to the ward cleanliness so we have the cleaners on contract aaaahm they are not government cleaners, they have to bring their own resources, apparently they don't get enough resources as of today". IN3

"Ward cleanliness… you educate the other team (cleaners) and you would see another team saying those ones have gone somewhere so sometimes it's like you are starting from point one again." IN 2

"Sometimes they are not being paid they take long time to be paid and that only decreases their morale you would see them just cleaning for the sake of cleaning not that they are interested cause they are not receiving their money." IN2.

The cleaners weren't always supported in their work.

"Sometimes it gets to the point of insulting our jobs that our jobs are not worth being proud of." FG3.

Discussion

This project aimed to assess compliance with evidence-based criteria of ward cleanliness in one acute male medical ward in a hospital in Malawi. Despite its recognition, evidence based practice is not standard in most LMIC. There are barriers related to resource challenges, limited access to information, interdisciplinary communication and

inconsistency between academic and clinical practice , time, knowledge of EBP, and individual-related barriers (Shayan et al., 2019). Despite this nurses have a role to improve practice.

The roles of the professional nurse is to promote a spirit of inquiry, generation and dissemination of new knowledge, and promote the use of clinical guidelines to improve the quality of care for patients (Brunt & Morris, 2024). Clinical guidelines have the potential to reduce unwarranted practice variation, enhance translation of research into practice, and improve healthcare quality and safety if developed and implemented according to international standards (Panteli et al., 2019). This project aimed to achieve this through the development and implementation of ward cleanliness protocol through a process of planned education and support led by nurses. Having a clear implementation plan, involving all stakeholders with input from an educational lead and unit matron has led to the successful implementation of the protocol.

The findings demonstrated that both nurses and cleaners have a role in improving ward cleanliness. Nurses facilitate the implementation of EBP by ensuring a supportive environment, providing education, being role models, and mentoring others (Brunt & Morris, 2024). Nurses and cleaners expressed satisfaction and appreciation of the ward cleaning protocol implementation, when interviewed. The success was potentially due to staff support through the shared and structured approach to education, supervision, mentorship and feedback. This is supported by Ayoubian et al. (2020) and (Duff et al. (2020) who identified the importance of leadership and organizational support together with a supportive education process in improving skills and confidence. Locock et al. (2020), further highlight the importance of support, suggesting staff who feel well supported and valued would be able emotionally and psychologically, to provide good support to patients. Verbal praise, getting individual attention or assistance when needed has been reported as a good way of recognizing people at work rather than receiving gifts (White, 2014). Despite the project successes challenges were reported.

Other studies have reported challenges in implementing evidence best practice due to lack of knowledge and skill to use evidence, time mismanagement, lack of motivation, lack of resources and training resulting in nurses continuing with traditional practice due to lack of incentive (Dagne & Beshah, 2021). Okomo et al., (2024) cites challenges such as Covid 19, understaffing and poor equipment and facilities and Gon et al., (2021) identify lack of education and supportive supervision as pit falls in the implementation. Similarly, this project found that although improvements were found in all areas of the post-implementation audit, there were continuing challenges. Many related to lack of equipment and failure of facilities. This is supported by Elling et al.(2022) and Okomo et al. (2024) who found that staffing, equipment and poor facilities were pitfalls to implementation of EBP.

The use of Contract Cleaning staff was a reported barrier to effective implementation. This is also reflected in the literature, which suggests that outsourcing cleaning staff impacts on the level of hygiene, with greater incidence of methicillin-resistant Staphylococcus aureus (MRSA) and worse patient perceptions of cleanliness (Toffolutti et al., 2017). In addition, Litwin et al. (2016) found a relationship between high staff turnover, low motivation and less trained staff. However, it is suggested by Daniels et al. (2019) that specific training with clear identification of responsibilities, together with a recognition of the vital role played by cleaning staff was crucial.

Overall, despite the challenges there was considerable improvement in all attributes compared to the baseline audit. Ward protocols were developed and followed by the cleaning teams. Consistency in cleaning and protocol utilization was observed across all attributes.

Limitations

Barriers were experienced during implementation mainly related to resources and COVID 19, areas beyond our control. Whilst patient guardians were involved, due to the limited funding, patients were not involved in either the development or evaluation of the intervention.

Recommendations

The project encompassing academic and clinical partnership has been successful in achieving positive change and should be rolled out in other clinical areas. Further human and financial investment is required to sustain the positive changes influenced by the ward cleanliness interventions. Continuous training that involves cleaners is key.

Funding and Acknowledgement

The evaluation of this project was funded by a Global Challenges Research Fund (GCRF) Small Projects grant administered by Cardiff University.

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