Infection Prevention in Practice 3 (2021) 100160

Available online at www.sciencedirect.com

Infection Prevention in Practice

journal homepage: www.elsevier.com/locate/ipip

An exploratory qualitative study of caregivers' knowledge, perceptions and practices related to hospital hygiene in rural Niger

Caroline Marquer [a], Ousmane Guindo [b], Issa Mahamadou [b], Elodie Job [c], Susan M. Rattigan [a], Céline Langendorf [a], Rebecca F. Grais [a], Sheila Isanaka [a,d,*]

[a] Department of Research, Epicentre, Paris, France
[b] Epicentre Niger, Maradi, Niger
[c] Médecins Sans Frontières, Paris, France
[d] Departments of Nutrition and Global Health and Population, Harvard T.H. Chan School of Public Health, USA

ARTICLE INFO

Article history:
Received 18 December 2020
Accepted 29 June 2021
Available online 3 July 2021

Keywords:
Caregiver knowledge
Hospital
Hygiene
Niger
Severe acute malnutrition
Qualitative

SUMMARY

Background: The risk of healthcare-associated infections is exacerbated by poor hygiene practices in health care facilities and can contribute to increased patient morbidity and mortality. In low-income settings, caregivers play a key role in maintaining proper hygiene during inpatient stays. We aimed to explore caregivers' knowledge, perceptions and practices related to hospital hygiene in a rural, sub-Saharan African setting.

Methods: We conducted an exploratory qualitative study among caregivers of children admitted to an inpatient therapeutic feeding center in Madarounfa, Niger. Individual interviews with 28 caregivers of hospitalized children were conducted to explore their knowledge, perceptions and practices of hygiene in the health facility.

Findings: Caregivers described a broad understanding of hygiene and reported knowledge of its importance in the hospital, particularly to prevent disease transmission and protect child health. Hygiene was perceived as a collective rather than individual responsibility. Caregivers reported on the poor hygiene practice of others and cited a lack of space and hygiene materials as barriers to correct hygiene practice. Caregivers described educational sessions and informal sharing with other caregivers as tools to gain knowledge and improve practice.

Conclusion: This exploratory study is unique in describing the perspective of caregivers in a low-resource hospital setting, a group often underrepresented when designing health interventions to improve hospital hygiene. Our findings suggest a strong knowledge of hospital hygiene among caregivers in this setting, with positive perception of its importance in health promotion. Poor individual practice was reported but may be improved through additional education and provision of hygiene materials.

* Corresponding author. Address: 14-34 Avenue Jean Juarès, Paris, 75019, France. Tel.: +33 (0)1 4021 5498; fax: +33 (0)1 4021 5100.
E-mail address: sheila.isanaka@epicentre.msf.org (S. Isanaka).

https://doi.org/10.1016/j.infpip.2021.100160

Introduction

Healthcare-associated infections (HAIs), defined as infections contracted while receiving medical treatment in a healthcare facility, contribute to increased patient morbidity and mortality and result in large financial impacts on health systems. [1,2] The burden of HAIs is especially high in sub-Saharan Africa and other low-resource settings, where HAIs are reported to occur three times more frequently than in high-resource settings. [3].

Poor hygiene in healthcare facilities, and poor hand hygiene practice in particular, contributes to the spread of HAIs. [4,5] Standardized protocols that aim to improve hand hygiene and reduce the risk of HAIs often focus on healthcare workers and omit the important role of caregivers in their hygiene strategies. [6—14] In pediatric hospitals in low-resource settings, caregivers often provide care to children throughout the hospital stay. Caregivers interact with their hospitalized children but also with the hospital environment (*e.g.* furniture and equipment, other caregivers and children, and healthcare staff) and thus act as potential actors of transmission from infected to clean environments. Poor hygiene practices among caregivers also increase their own exposure and individual risk of infection while attending to their children in hospital. [15].

Given the important potential role of caregivers in HAIs but limited understanding of caregiver knowledge and practices related to hygiene in low-resource health facilities, we conducted an exploratory study of caregiver knowledge, perceptions and practices related to hospital hygiene in rural Niger, with the aim to inform and improve the quality of comprehensive hygiene strategies in low-resource hospital settings.

Methods

Study setting

The study was conducted in the inpatient therapeutic feeding center of Madarounfa Health District of the Maradi region of south-central Niger in 2017. In collaboration with the Ministry of Health of Niger, Médecins Sans Frontières (MSF) has provided pediatric care in the Madarounfa Health District since 2001. In 2016, over 4,800 children were treated for complicated severe acute malnutrition (SAM) in the MSF-supported center. Each child admitted to the health facility was accompanied by a usually female caregiver who stayed continuously with the child in the inpatient ward throughout the period of hospitalization, lasting approximately five to seven days. During hospitalization, the health facility provided the accompanying caregivers access to sanitation facilities, food, as well as health and hygiene education at no charge.

Study design

We performed an exploratory qualitative study with a phenomenology approach to describe hospital hygiene knowledge, perception and practice from the caregivers' perspective. In this study, hygiene knowledge included the caregiver definition of hospital hygiene, as well as the information that they received and shared during their stay in the hospital. Hygiene perception included how caregivers explained the importance of hygiene and their interpretation of their own knowledge. Hygiene practice was defined as the implementation of hygiene practices by the caregivers.

Data collection

Caregivers of children hospitalized for complicated SAM who provided written consent to participate in the study were purposively selected. An interview guide was developed by study staff consisting of open-ended and probing questions to explore caregiver knowledge, perceptions and practices related to hospital hygiene. The interview guide was piloted prior to data collection for cultural relevance and clarity. Individual interviews were conducted from October to November 2017 with 28 caregivers in the local language. Interviews were conducted in a quiet space of the health facility by trained study staff and lasted no more than one hour each. Audio recordings were transcribed verbatim, and then translated into French using standard word processing software. Each transcript was assessed for data quality before analysis.

Data analysis

Interview transcripts were manually coded using an inductive approach. [16,17] Thematic content analysis was applied to systematically code the text and identify initial and emerging themes relevant to the objectives of the study. [18,19] Exemplar quotations of perceptions, opinions and experiences selected to demonstrate those most frequently expressed or those exemplifying isolated behavior are reported in text to support key findings. [20].

Results

Hygiene knowledge

Three main themes related to knowledge regarding hygiene in a hospital setting were identified by caregivers: the distinction between personal and environmental hygiene, knowledge of contamination and transmission, and having gained knowledge through educational sessions conducted during their hospital stay.

Caregivers distinguished two encompassing components of hygiene: personal hygiene (caregiver and the child) and environmental hygiene (hospital and home). In general, caregivers linked the activities related to both components with prevention of disease and good health.

> "A lack of hygiene makes a child contract a disease that leads to dirt, diarrhea and waste." *Caregiver 6*

> "There is a link between keeping the household clean, washing your body, taking care of your hair and staying healthy (to not contract a disease)... take a shower and wear clean clothes, sweep the room and spray perfume." *Caregiver 2*

Caregivers were knowledgeable about general information regarding hygiene practices and were able to explain the process of transmission, where microbes originate from the sick patient and their personal belongings, transfer to hands via contact, and then pass either directly to others via personal contact or indirectly via the surrounding environment.

> "The spread of diseases in the hospital, you take a cup and give water to your child or someone borrows it and gives water to his/her

child, you take it back, you don't know which disease the child has and you can contract it. Same for the ladle of milk; you lend it, you do not know which disease the child has, and you can get it. There is also the woman who want to borrow clothes because her child has soiled hers. You lend to her, you don't know which disease has the child, and you can get it." *Caregiver 3*

Caregivers also explained that knowledge about the correct hygiene practice had been obtained from educational sessions provided by hospital staff and from informal sharing with other caregivers. Educational sessions delivered by hospital staff focused on the importance of hygiene, such as hand washing, avoiding sharing materials, showering, latrine use, and washing of clothing in the dedicated space within the health facility. Caregivers described these sessions as helpful, but some admitted not having been able to find time to attend the session due to being too busy caring for their sick children.

"They come room by room to provide information about hygiene. There are also pictures to show how to wash our hands, how to take care of food, and how to use the toilets. The man came to talk also about propagation of disease. They make an effort." *Caregiver 11*

"If we want to do the laundry and we do not know how to pour the dirty water, we ask another caregiver to explain it. Others just pour it in the same place where we wash the clothes and make the place dirty." *Caregiver 6*

"There is a man who is sensitizing us about how to take care of our body and our environment. He talks to us about important points, but I don't have enough time to stay for each session. My daughter has a lot of diarrhea that I have to take care of." *Caregiver 4*

Hygiene perception

In this study, caregivers reported perceiving hygiene as important for maintaining good health. They also perceived hospital hygiene as a collective responsibility of all people in the ward, including both staff and caregivers. Perceptions of hygiene practice were generally positive in the hospital, where hygiene was described as fundamental for proper healthcare.

"Hygiene is elementary for health care." *Caregiver1*

"We understand that in the hospital, we must wash the hands of our children before and after eating; so before eating we wash them three times with soap and water and we brush our teeth." *Caregiver 1*

Some caregivers reported a perception of poor hospital hygiene due to a lack of space, especially when the number of hospital admissions was high, and children sharing beds.

Caregivers expressed concern about contamination, and health care facilities were described as a high-risk environment for disease transmission. Caregivers specifically perceived sharing materials (such as cups, plates, spoons) with other caregivers in the health facility as presenting an important risk of disease transmission.

"In the hospital, you can catch a disease; if an insect touches the food, and we don't know it, that's why they ask us to take care of the food. If the child defecates, to quickly throw the stool away and go to wash." *Caregiver 7*

"When two children are hospitalized in the same bed, the way I take care of the bed, I fear that the other woman cannot do the same and mostly that she doesn't respect the rules provided." *Caregiver 4*

Additionally, caregivers described hygiene as a collective responsibility of all people in the health facility, rather than of individuals. They expressed that all people within a health facility were responsible for both maintaining their own hygiene behavior and keeping others accountable to this hygiene standard.

"In the hospital, good hygiene as it is practiced is a group thing." caregiver 10

"In the hospital, we come for health, we do have to respect what they tell us about hygiene, it becomes a concern for us; there is not enough support in maintaining good hygiene within the hospital." *Caregiver 1*

They explained that facility rules to outline acceptable hygiene behavior in the health facility were well communicated and collectively understood, including procedures for bathing children, laundry and even removing shoes in the ward.

"If my child defecates or urinates, I change his clothes after washing his body. Then I wash his clothes with the distributed soap." *Caregiver 1*

Hygiene practices

Caregivers were open to classify the behavior of other caregivers as either adherent or non-adherent to correct hygiene practices, while expressing more reserve in describing their own poor adherence to facility rules.

"Some apply what you tell them, others don't. We cannot change some women because their behaviors, even at home, are like that." *Caregiver 6*

"The woman who soiled the shower in the hospital, she does the same in her house. This woman is like that, she is dirty." *Caregiver 2*

Many caregivers, however, did not identify handwashing as a priority when describing their routine practice. They described a lack of soap provided by the health facility and their own limited means to purchase soap. Poor access to soap was described to result in omitting hygiene actions outright or replacing good hygiene practices with suboptimal alternatives.

"They provide [soap], but it is not enough." *Caregiver 2*

"If I don't have any more soap, I will use ashes to wash the hands and the body. It is also with ashes, for example, you add the ashes to the water, and you let the mixture sit for some time. Then you collect the first layer, this is what we use to wash the children." *Caregiver 13*

In contrast to observations of poor hygiene among other caregivers and their own practice, participants considered the hygiene actions of healthcare staff to be satisfactory within the hospital.

"The poor hygiene in the health facility is because of the women, not the staff. It is really rare to see staff not respecting the rules." *Caregiver 10*

"The health staff practice good hygiene, and if you do the same, you will protect your life. From the morning to evening, they sweep and clean. They clean the toilets, showers and the beds. For the beds, they clean with soap before another patient comes." *Caregiver 10*

Discussion

In hospitals located in low-resource settings, caregivers often play an important role in ensuring the proper hygiene of patients and their environment. [21,22] By being in direct contact with patients and material and by circulating in the patient wards, caregivers can play a role in the transmission of pathogens resulting in HAIs. Despite the key role caregivers play in hospital settings and their implication in HAI prevention and transmission, research on hospital hygiene from the caregivers' perspective has been limited. This study aimed to specifically explore caregiver knowledge, perceptions and practices related to hospital hygiene in rural Niger.

The results of this study support greater recognition of the caregiver perspective when deploying hygiene measures and protocols in hospitals. In general, caregivers demonstrated good knowledge of the principles of hospital hygiene, both in terms of the theoretical mechanisms of disease transmission, such as poor hygiene practice resulting in contamination and patient-to-patient transmission, and in terms of activities necessary for prevention, such as hand washing. They further recognized the importance of these principles for maintaining or improving health and for ensuring proper care of their children. However, despite demonstrating knowledge of the importance of good hand hygiene, few caregivers described hand washing as part of their regular hygiene practices in the hospital. Poor hand hygiene practices reported among caregivers in hospital may be of particular concern, given the essential role of hand washing in standard hygiene practice. [2,4,5].

Caregivers explained poor adherence to proper hand hygiene by a lack of water and soap at the hospital, while also citing over-crowding and the sharing of materials with others as additional barriers to good hygiene in the hospital. Similar barriers have been reported elsewhere both by caregivers and healthcare workers. Healthcare facilities in similar low-resource settings report limited access to running water and hygienic supplies such as soap and alcohol solution, [6,13–15,21,24] though hand hygiene compliance has been reported to be low even in adequately-resourced hospitals. [12,25].

It is noteworthy that caregivers perceived the hygiene practice of the healthcare workers in this setting to be satisfactory. This contrasts with a study in the same hospital, which found healthcare worker compliance with hand hygiene guidelines to be between 11 and 36% depending on the season [22], a level of compliance that was low but consistent with that reported in several other studies in similar settings. [6,26,27] One approach to collectively improve good hospital hygiene has involved empowering caregivers to participate in the monitoring of individual and staff hygiene behaviors and provide constructive performance feedback. [28] While the traditional hierarchical power structure between patients and healthcare personnel may pose a potential barrier to caregivers providing feedback to healthcare personnel [24,29,30], this could be mitigated by healthcare workers inviting caregivers to monitor their practices. [31,32] Studies of this approach have shown that caregivers asking healthcare workers if they washed their hands before entering the patient room improved indicators of staff hand hygiene, though the impact of this behavior on infection rates has yet to be determined. [28,33,34].

Despite gaps between knowledge and practice, educational sessions and distribution of hygiene materials were identified by the caregivers as possible mechanisms to reinforce good hygiene practices in this setting. Educational sessions, which are central to the WHO Multimodal Hand Hygiene Improvement Strategy and emphasize the realization of specific hygiene instructions into practice, can be tailored to the target population considering their existing knowledge, needs and questions and be reinforced with the use of complementary reminders, such as leaflets and posters. [35] As caregivers reported not having sufficient time to attend the educational sessions, creative delivery mechanisms, such as physical posters including detailed pictures, could be explored to ensure all caregivers have the opportunity to effectively gain knowledge.

Conclusion

This exploratory study is limited in sample size and triangulation of methods for confirmability of results, but it is unique in describing the perspective of caregivers in a low-resource hospital setting, a group often underrepresented when designing health interventions to improve hospital hygiene. Our findings suggest a strong knowledge of hospital hygiene among caregivers in this setting, with positive perception of its importance in health promotion and healthcare staff practices. Individual practice may be improved through additional education and provision of hygiene materials.

CRediT author statement

Caroline Marquer: conceptualisation; methodology; supervision; data curation; validation; formal analysis; writing — original draft. Ousmane Guindo: investigation; supervision; project administration; writing — review and editing. Issa Mahamadou: investigation; supervision; data curation; writing — review and editing. Elodie Job: resources; writing — review and editing. Susan M. Rattigan: writing — review and editing. Céline Langendorf: conceptualisation; writing — review and editing. Rebecca F. Grais: conceptualisation; project administration; writing — review and editing; funding acquisition. Sheila Isanaka: conceptualisation; writing — original draft; writing — review and editing.

Acknowledgements

We thank all of the health center staff, participating caregivers and our field research teams.

Source of funding

Funding for this study was provided by Médecins Sans Frontières - Operational Center Paris. Epicentre receives core funding from Médecins Sans Frontières.

Conflict of interest statement

All authors declare that they have no conflict of interests.

Ethical considerations

Ethical approval for the study was provided by the Comité Consultatif National d'Ethique in Niger and the Comité de Protection des Personnes, Ile-de-France. Written informed consent was obtained from all interview participants.

References

[1] Jarvis WR. Selected aspects of the socioeconomic impact of nosocomial infections: morbidity, mortality, cost, and prevention. Infect Control Hosp Epidemiol 1996;17:552—7.

[2] Curtis LT. Prevention of hospital-acquired infections: review of non-pharmacological interventions. J Hosp Infect 2008;69:204—19.

[3] Allegranzi B, Nejad SB, Combescure C, Graafmans W, Attar H, Donaldson L, et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. Lancet 2011;377:228—41.

[4] Kampf G, Loffler H, Gastmeier P. Hand hygiene for the prevention of nosocomial infections. Dtsch Arztebl Int 2009;106:649—55.

[5] Jalalpoor S, Ebadi A. Effective sources of nosocomial infection: staff hands and hospital surfaces. Int J Biol Biotechnol 2011;8:631—6.

[6] Holmen IC, Seneza C, Nyiranzayisaba B, Nyiringabo V, Bienfait M, Safdar N. Improving Hand Hygiene Practices in a Rural Hospital in Sub-Saharan Africa. Infect Control Hosp Epidemiol 2016;37:834—9.

[7] Holmen IC, Niyokwizerwa D, Nyiranzayisaba B, Singer T, Safdar N. Challenges to sustainability of hand hygiene at a rural hospital in Rwanda. Am J Infect Control 2017;45:855—9.

[8] Shrivastava SR, Shrivastava PS, Ramasamy J. Strengthening water, sanitation, and hygiene services in health establishments: An urgent priority of WHO. J Res Med Sci 2015;20:1016—7.

[9] Talbot TR, Johnson JG, Fergus C, Domenico JH, Schaffner W, Daniels TL, et al. Sustained improvement in hand hygiene adherence: utilizing shared accountability and financial incentives. Infect Control Hosp Epidemiol 2013;34:1129—36.

[10] Allegranzi B, Pittet D. Role of hand hygiene in healthcare-associated infection prevention. J Hosp Infect 2009;73:305—15.

[11] Whitby M, Pessoa-Silva CL, McLaws ML, Allegranzi B, Sax H, Larson E, et al. Behavioural considerations for hand hygiene practices: the basic building blocks. J Hosp Infect 2007;65:1—8.

[12] Jenner EA, Fletcher BC, Watson P, Jones FA, Miller L, Scott GM. Discrepancy between self-reported and observed hand hygiene behaviour in healthcare professionals. J Hosp Infect 2006;63:418—22.

[13] Pittet D. Improving adherence to hand hygiene practice: a multidisciplinary approach. Emerg Infect Dis 2001;7:234—40.

[14] Marjadi B, McLaws ML. Hand hygiene in rural Indonesian healthcare workers: barriers beyond sinks, hand rubs and in-service training. J Hosp Infect 2010;76:256—60.

[15] Islam MS, Luby SP, Sultana R, Rimi NA, Zaman RU, Uddin M, et al. Family caregivers in public tertiary care hospitals in Bangladesh: risks and opportunities for infection control. Am J Infect Control 2014;42:305—10.

[16] Cavanagh S. Content analysis: concepts, methods and applications. Nurse Res 1997;4:5—16.

[17] Elo S, Kyngas H. The qualitative content analysis process. J Adv Nurs 2008;62:107—15.

[18] Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qual Health Res 2005;15:1277—88.

[19] Priest H, Roberts P, Woods L. An overview of three different approaches to the interpretation of qualitative data. Part 1: Theoretical issues. Nurse Res 2002;10:30—42.

[20] Denzin N, Lincoln Y. The Safe handbook of qualitative research. Sage Publications; 2005.

[21] Horng LM, Unicomb L, Alam MU, Halder AK, Shoab AK, Ghosh PK, et al. Healthcare worker and family caregiver hand hygiene in Bangladeshi healthcare facilities: results from the Bangladesh National Hygiene Baseline Survey. J Hosp Infect 2016;94:286—94.

[22] Tang K, Berthe F, Nackers F, Hanson K, Mambula C, Langendorf C, et al. Hand hygiene compliance and environmental contamination with gram-negative bacilli in a rural hospital in Madarounfa, Niger. Trans R Soc Trop Med Hyg 2019;113:749—56.

[24] Hancart-Petitet P, Dumas C, Faurand-Tournaire AL, Desclaux A, Vong S. Social and cultural dimensions of hygiene in Cambodian health care facilities. BMC Public Health 2011;11:83.

[25] Filion K, Kukanich KS, Chapman B, Hardigree MK, Powell DA. Observation-based evaluation of hand hygiene practices and the effects of an intervention at a public hospital cafeteria. Am J Infect Control 2011;39:464—70.

[26] Saito H, Inoue K, Ditai J, Wanume B, Abeso J, Balyejussa J, et al. Alcohol-based hand rub and incidence of healthcare associated infections in a rural regional referral and teaching hospital in Uganda ('WardGel' study). Antimicrob Resist Infect Control 2017;6:129.

[27] Abdella NM, Tefera MA, Eredie AE, Landers TF, Malefia YD, Alene KA. Hand hygiene compliance and associated factors among health care providers in Gondar University Hospital, Gondar, North West Ethiopia. BMC Public Health 2014;14:96.

[28] Landers T, Abusalem S, Coty MB, Bingham J. Patient-centered hand hygiene: the next step in infection prevention. Am J Infect Control 2012;40:S11—7.

[29] Bellissimo-Rodrigues F, Pires D, Zingg W, Pittet D. Role of parents in the promotion of hand hygiene in the paediatric setting: a systematic literature review. J Hosp Infect 2016;93:159—63.

[30] Longtin Y, Sax H, Leape LL, Sheridan SE, Donaldson L, Pittet D. Patient participation: current knowledge and applicability to patient safety. Mayo Clin Proc 2010;85:53—62.

[31] Buser GL, Fisher BT, Shea JA, Coffin SE. Parent willingness to remind health care workers to perform hand hygiene. Am J Infect Control 2013;41:492—6.

[32] Wu KS, Lee SS, Chen JK, Tsai HC, Li CH, Chao HL, et al. Hand hygiene among patients: attitudes, perceptions, and willingness to participate. Am J Infect Control 2013;41:327—31.

[33] McGuckin M, Taylor A, Martin V, Porten L, Salcido R. Evaluation of a patient education model for increasing hand hygiene compliance in an inpatient rehabilitation unit. Am J Infect Control 2004;32:235—8.

[34] McGuckin M, Waterman R, Porten L, Bello S, Caruso M, Juzaitis B, et al. Patient education model for increasing handwashing compliance. Am J Infect Control 1999;27:309—14.

[35] World Health Organization. Guide to implementation: a guide to the implemenation of the WHO multimodal hand hygiene improvement Strategy. Geneva: World Health Organization; 2009. p. 48.