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Research Article

Infection Prevention and Control in North-East Nigeria: An Assessment of Hand Hygiene in Health Care Facilities in Protracted Crisis Environment February 2019

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ABSTRACT

Introduction: Hand hygiene is the single most effective action to prevent the spread of Healthcare-Associated Infections and Antimicrobial Resistance among health care workers and patients. The lack of effective hand hygiene and materials for hand hygiene is a major problem for patient safety in health care facilities. We conducted this survey in February 2019 to assess the situation of hand hygiene in health care facilities in Borno State, the epicenter of insurgency in North-East Nigeria.

Method: An interviewer-administered questionnaire was used to assess the situation of hand hygiene from 103 health care facilities selected from across Borno State. The questionnaire used was adopted from the WHO Hand Hygiene Self-Assessment Framework at the facility level. It had five sections (System change, training, and education, evaluation and feedback, reminders in the workplace, institutional safety climate for hand hygiene) and 27 indicators framed as questions with "yes" or "no" response. Each health facility's response was scored, calculated and expressed as a proportion of the total score of 500. Based on the score obtained, each facility was assigned to one of four categories ranging from inadequate, basic, intermediate to advanced hand hygiene level.

Results: One hundred and three health facilities were involved in the assessment. Eighty-nine (86.4%) were public, government-owned health care facilities. The highest participation was from the central zone of the state with 43 (41.7%) while the northern zone of the state recorded the lowest participation 25 (24.3%). Central zone participation was 43 (41.7%). Seventy-eight (75.8%) of the total health facilities had inadequate hand hygiene levels, 21 (20.4%) had basic hand hygiene levels, 4 (3.8%) had intermediate hand hygiene level and none (0%) had advanced hand hygiene level. Summary statistics (mean ± SD, Median: IQR) for the five sections showed the following; System change (availability of soap, running water, single-use hand towels)-19 ± 21, 15: 30; education and training (on hand hygiene)-10.3 ± 15.0, 0: 3.0; evaluation and feedback (assess availability of water, soap, towel, and hand hygiene compliance)-13.0 ± 17.4, 0: 25; reminders in the workplace (posters and leaflets)-19.2 ± 21.0, 20: 15 and institutional safety climate for hand hygiene (functional hand hygiene teams, patient involvement in hand hygiene and regular communication)-14 ± 25.0,0:20.

The overall scores summary statistics were 75.6 ± 78.5, 55: 125.

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Conclusion: This assessment revealed gross inadequacies in hand hygiene practice and hand hygiene promotion in government-owned Primary Health Care Facilities in Borno state. There is a need to scale up efforts to improve hand hygiene practices and hand hygiene promotion activities in the State to enhance the quality of care and minimize the incidence of Healthcare-Associated Infections.

Keywords: Hand hygiene; Health care; Antimicrobial resistance; HAI

INTRODUCTION

The ten-year insurgency in the North-eastern part of Nigeria mainly affects the States of Borno, Adamawa, and Yobe (BAY) with Borno being the epicenter. These protracted crises have led to immense destruction of infrastructure, loss of lives, abuse, deliberate attack on civilian targets, forced internal displacements and the establishment of internally displaced populations. Currently, 7.1 million people require humanitarian assistance and 1.8 million people internally displaced with over 80% in Borno State [1]. The health sector is severely hit with about two-thirds of health facilities damaged by the conflict and just a third fully functional [1].

Health workers have lost their lives or moved from unstable locations to stable areas with consequent severe shortages in a region hitherto with health workforce constraint before the outbreak of hostilities. The lack of adequate human resources in health, poorly equipped facilities, prolonged conflict, and over-crowded camps have serious consequences for the quality of health services including poor Infection Prevention and Control (IPC) practices implemented at different levels of service delivery.

Outbreaks and spread of infectious diseases are of common occurrence in fragile, conflict-affected and vulnerable environments with substantial morbidity and mortality due to compromised health infrastructure. For instance, in 2018, cholera outbreaks affected 18 local government areas in the BAY States with a total of 4250 cases recorded. A strong health system should, therefore, include culture and setup of IPC, such as improved hygiene conditions, appropriate use and availability of Personal Protective Equipment (PPE), and improved healthcare waste management. These will ensure a better and appropriate response to manage outbreaks and will prevent or reduce the spread of infectious diseases including Healthcare-Associated Infections (HAI) and Antimicrobial Resistance (AMR).

This article specifically assesses the hand hygiene practices in selected health care facilities in Borno State following an IPC survey conducted in the State. The purpose of the survey was to determine the current IPC situational analysis in various health delivery platforms in the State, make appropriate recommendations and develop State IPC guidelines and monitoring tools. There is no gainsaying the fact that the correct practice of hand hygiene is the single most effective action to reduce Healthcare-Associated Infections. This practice results in the reduction of the number of transient flora on the hands with the consequent reduction of harmful pathogens. The assessment findings showed gaps in hand hygiene knowledge, attitude and practices and also hand hygiene infrastructure.

MATERIALS AND METHODS

This study was conducted in health care facilities located in the insurgency affected the State of Borno in North-East Nigeria. In March 2019, the state established an Infection Prevention and Control (IPC) committee with a mandate to effectively strengthen Infection Prevention and Control (IPC) practices and procedures in all public health facilities and other health care providers with the aim of reducing Healthcare-Associated Infections (HAI) and Antimicrobial Resistance (AMR) thereby achieving best health outcomes and mitigating outbreaks.

A baseline assessment survey was conducted across health facilities in Borno State. The selection of 103 health facilities from 9 local government areas from the three senatorial zones was achieved by a multi-stage sampling technique. Local government areas with security concerns were automatically excluded from the survey/assessment.

Data tool

The Hand Hygiene Self-Assessment Framework (HHSAF) tool adopted from the WHO database was used for the survey. It is a self-administered, systematic tool with which a situation analysis of hand hygiene promotion and practices within an individual health-care facility is obtained. It is divided into 5 components and 27 indicators. The five components include system change, training and education, evaluation and feedback, reminders in the workplace and institutional safety climate for hand hygiene. The five components reflect the 5 elements of the WHO Multimodal Hand Hygiene Improvement Strategy expert consensus and have been framed as questions with defined answers (either "Yes/No" or multiple options) to facilitate self-assessment. Based on the score achieved for the five components, the facility is assigned to one of four levels of hand hygiene promotion and practice- inadequate, basic, intermediate or advanced [2].

Scoring system

Facilities with scores of 0-125 have inadequate hand hygiene levels. Those that scored between 126-250 have basic hand hygiene level and facilities with scores of 251-375 have intermediate hand hygiene level while those who score of 375-500 have advanced hand hygiene level.

Data analysis

Data were entered into and analyzed using Microsoft Excel version 2013 [3]. The total score for an individual health facility was calculated and expressed as a figure. The total achievable score by each health facility is 500. We obtained summary

statistics and expressed them as frequencies and proportions. The mean and/or median and interquartile range were measures of dispersion used to express the spread of the values obtained from the assessment.

RESULTS

One hundred and three health facilities were selected for the assessment. Of this, 72 (69.9%) were Primary Health Care Facilities (PHCs), 10 (9.7%) were general hospitals, 2 (1.9%) were private hospitals, 2 (1.9%) were tertiary hospitals and 17 (16.5%) were internally displaced person camp clinics. Eighty-nine (86.4%) were government-owned public health facilities.

The highest participation was from the central zone of the state with 43 (41.7%) followed the southern zone of the state was 35 (34.0%) while the northern zone of the state recorded the lowest participation of 25 (24.3%).

The majority of health facilities 78 (75.7%) had inadequate hand hygiene levels. Twenty-one (20.4%) had basic hand hygiene levels. Four (3.9%) were in the intermediate hand hygiene level while no health facility was in the advanced hand hygiene level (Table 1).

Component 1: System change

The mean score for the system change was 19.3 ± 21.0 (Table 2).

Majority 54 (52.4%) of the health facilities visited had no clean supply of running water for hand hygiene. Only 49 (47.6%) had clean running water.

Soap either in liquid or bar form was available for hand hygiene in only 44 (42.7%) of the health facilities. The majority 59 (57.3%) had no soap for hand hygiene (Figure 1).

Single-use hand towels were not available for hand drying in 94 (91.3%) of the facilities.

Similarly, 54 (54.4%) had no dedicated budget for procurement of hand hygiene products and hand hygiene promotion.

Table 1: Health facility scores.

Score	Frequency (n)	Percentage (%)
0-125 (Inadequate)	78	75.7
126-250 (Basic)	21	20.4
251-375 (Intermediate)	4	3.9
376-500 (Advanced)	0	0.0
Total	103	100

Table 2: Summary statistics for the 5 components and overall score.

Components	Values (mean ± SD, median: IQR) *
System change	19.3 ± 21.0,15:30
Education and training	10.3 ± 15.0, 0:15
Evaluation and Feedback	13.0 ± 17.4, 0:25
Reminders in the workplace	19.2 ± 21.0, 20:15
Institutional safety climate	14.0 ± 25.0, 0:20
Overall score (mean ± SD, median: IQR)	75.6 ± 78.5, 55:125

*Mean a measure of central tendency that describes the average of all numbers in a data set

Median is a measure of central tendency that describes the middle number in a sequence of numbers

The interquartile range represents the spread of the middle fifty of a set of numbers and removes the outliers. It is calculated by subtracting the first quartile from the third quartile

The standard deviation is that statistic that measures the dispersion of a data set relative to its mean

Component 2: Education and training

The health care workers in 61 (59.2%) the health care facilities visited for this assessment had never been trained on hand hygiene (Figure 2). Mandatory training of health care workers at the commencement of employment was conducted in only 3 (2.9%) of the health facilities visited. Regular training of health care workers on hand hygiene took place in 7 (6.8%) of the visited health facilities. Of the 103 facilities, only 32 (31.1%) of health care workers had health care workers trained on hand hygiene at least once.

In only 16 (15.5%) of health facilities, there is a system in place to assess the completeness of hand hygiene training offered to health care workers. In 87 (84.5%), there is no system in place to assess the completeness of hand hygiene training.

Professionals with the adequate skill to serve as hand hygiene trainers were available in only 28 (27.2%) of health facilities.

Education and training had a mean score and standard deviation of 10.3 ± 15.0 (Table 2).

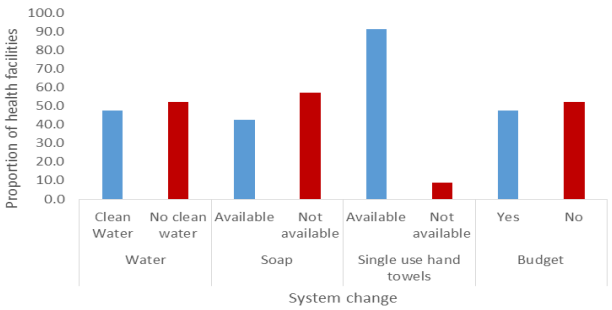

Figure 1: Hand hygiene system change.

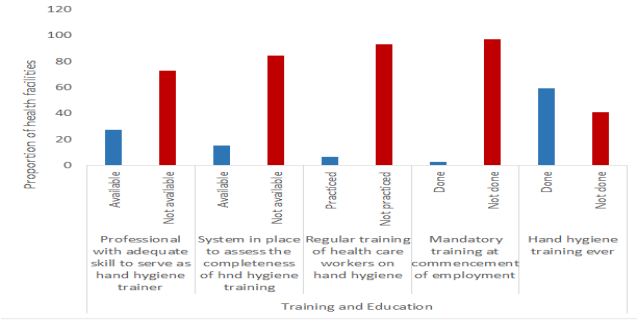

Figure 2: Hand hygiene training and education.

Component 3: Evaluation and feedback

Annual ward-based audits to assess the availability of hand rubs, soap, single-use hand towels, and other hand hygiene materials is conducted in 10 (9.7%) of the visited health facilities as the majority 93 (90.3%) do not perform such audits.

Direct monitoring of hand hygiene compliance is conducted irregularly in 19 (17.4%) of the facilities while the majority 83 (80.6%) do not monitor hand hygiene compliance.

Mean score and standard deviation for hand hygiene evaluation and training 13.0 ± 17.4 (Table 2).

Component 4: Reminders in the workplace

In 32 (31.1%) of the facilities, posters explaining the indication for hand hygiene were displayed inwards and treatment areas. Seventy-one (68.9%) did not display the posters. Similarly, only 33 (32.0%) displayed posters explaining the correct use of hand rub as the majority 70 (68.0%) did not display such posters.

At least an annual systematic audit of all posters for evidence of damage occurs in 16 (15.5%) of the facilities. Audits conducted every 2 to 3 months occur in 7 (6.8%) of health facilities while the majority 80 (77.7%) have never performed audits to check for damaged posters.

Hand hygiene information leaflets were available in 15 (14.6%) of the facilities while the majority 88 (86%) did not have the hand hygiene leaflets available for use (Figure 3).

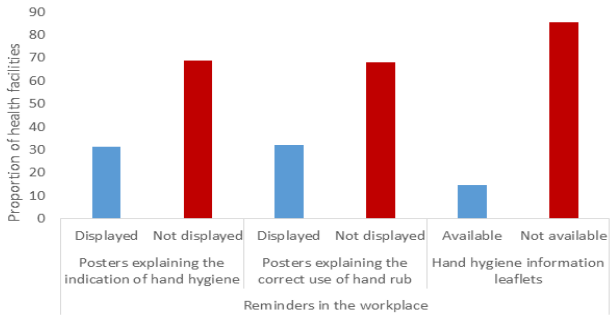

Figure 3: Hand hygiene reminders in the workplace.

Component 5: Institutional safety climate for hand hygiene

Institutional safety climate for hand hygiene 14.0 ± 25.0 (Table 2).

Hand hygiene teams were established and functional in 9 (8.7%) of the health care facilities visited. Of these, 5 met regularly as a team and had time to conduct hand hygiene promotion within their facilities. However, the majority 94 (91.3%) of the 103 health care facilities visited had no hand hygiene teams.

Patient involvement by active participation in hand hygiene practice and promotion was present in 42 (40.8%) while in 61 (59.2%), there was no patient involvement in hand hygiene.

Formalized programs for patient engagement in hand hygiene was present in 19 (18.4%). The vast majority 84 (81.6%) had no such programs for patient engagement.

In 85 (82.5%) of the facilities, there was no regular communication that mentioned hand hygiene. Only 18 (17.5%) of the facilities were there communication that mentioned hand hygiene (Figure 4).

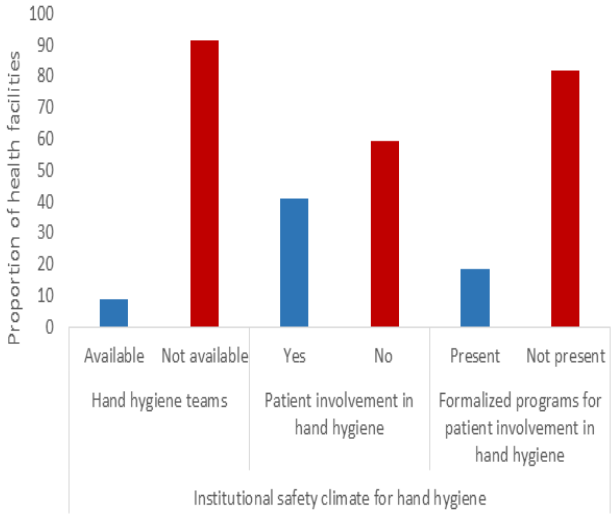

Figure 4: Institutional safety climate for hand hygiene.

DISCUSSION

Hand hygiene either through handwashing with soap and water or through the use of alcohol-based hand rubs is the single most effective measure to prevent the spread of hospital-acquired infections from health care workers to patients and vice versa [4]. Hand hygiene is simple to perform and is easily

implemented provided all the materials and resources for hand hygiene such as clean running water, soap, alcohol-based hand rubs and single-use hand towels are readily available [5]. Despite this, hand hygiene compliance among health care workers in developing countries is low [6] and the prevalence of Healthcare-Associated Infections developing countries stands at 5%-15% in hospitalized patients and 50% in patients in the intensive care unit [7]. However, factors contributing to low hand hygiene include non-availability of hand hygiene materials, poor access to hand hygiene facilities, excessive patient load, time taken to perform hand hygiene using soap and water [8], limited availability of alcohol-based hand rubs, lack of perceived need for hand hygiene by health care workers, sheer lack of motivation, soap induced dermatitis [9,10] and poor knowledge of appropriate times to perform hand hygiene [11]. The lack of senior health facility leadership to make hand hygiene a priority in many of the health centers visited is a major contributor to failed or poor adherence to hand hygiene [12,13].

Training and education are at the cornerstone of implementing an effective hand hygiene promotion program and results in significantly improved hand hygiene compliance among health care workers [14]. Training and education of health care workers should be done frequently and should include information on the impact and burden of Healthcare-Associated Infections, major patterns of transmission of pathogens causing Healthcare-Associated Infections, the critical role of hand hygiene and indications for hand hygiene based on the World Health Organizations five moments for hand hygiene. This information should be made available to health care workers at regular intervals. Where feasible, practical sessions should be integrated into the training to encourage practical demonstration of the various techniques used to achieve hand hygiene. Training should be made mandatory for all cadres of health care staff at employment. This should then be followed by an ongoing annual refresher training. Capacity-building may also involve the use of involving the use of educational videos, e-learning, pamphlets, and lectures [14]. Unfortunately in developing countries, training and education of health care workers on hand hygiene is irregular, deficient or completely non-existent [15].

Evaluation and feedback of a facility's hand hygiene program are important because it measures the effectiveness of the current hand hygiene policies, gives employees feedback on their performance and helps identify areas needing increased attention [13]. The most effective way of evaluating hand hygiene practice is through direct observation of the procedure done with very minimal interference while identifying opportunities for hand hygiene and observing if the health care worker performed hand hygiene [16]. Calculating a percentage on a monthly basis will identify if educational efforts are working. This is achieved by obtaining the proportion of missed opportunities for hand hygiene out of the total number of opportunities for hand hygiene observed; usually 20 in a month or 5 in a week. Indirect observation of hand hygiene compliance involves the monitoring of consumption of alcohol-based hand rubs every 3 months and/or consumption of soap/paper towels [17,18].

Regular feedback to staff helps them recognize gaps in practices and knowledge and demonstrates improvement and sustains motivation.

Regular ward-based audits should be conducted annually at least to assess the availability of hand hygiene resources. In this study, we found that more than 90% never conducted audits to assess the availability of hand hygiene resources. This is a setback for the hand hygiene promotion program.

Numerous studies have demonstrated the effectiveness of having reminders in the workplace that demonstrate the indications for hand hygiene [18], the technique for handwashing using soap and water and hand rubbing using alcohol rub. These reminders should be placed in all wards and patient treatment areas. Reminders serve as tools to prompt health-care workers to practice hand hygiene and to inform patients and their visitors of the standard of care they should expect from their health-care workers. Posters and pocket leaflets are among the most common types of reminders [19].

The composition of the hand hygiene team will vary. It is likely to most frequently be part of an infection control unit but may range (depending on resources available) from a single person with the role of managing the hand hygiene program, to a group of staff members from various departments within the facility with meetings dedicated to the hand hygiene program. This study found that hand hygiene teams were lacking in most of the facilities visited.

CONCLUSION

We conclude from this assessment that hand hygiene practice and promotion in health care facilities in Borno State are deficient. Training of health care workers is not practiced frequently. There is a need for the government to train community health promoters on hand hygiene, include hand hygiene training in the curriculum of pre-service health institutions and allocate funding for hand hygiene in the budget of the Ministry of Health.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

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