

The practice of hand hygiene in the maternities of the public hospitals of Lubumbashi

Mbutshu Lukuke Hendrick^{*}, Ntambue Mukengeshayi Abel¹, Makoutode Michel², Malonga Kaj Françoise¹

¹ School of Public Health, University of Lubumbashi, Democratic Republic of Congo

² Regional Institute of Public Health, Republic of Benin

***Corresponding author**

Mbutshu Lukuke Hendrick, School of Public Health, University of Lubumbashi, Democratic Republic of Congo.

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Abstract

Introduction: The objective of this study was to evaluate the practice of hand hygiene in the maternities of the public hospitals of Lubumbashi.

Method and techniques: We carried out a cross-sectional descriptive study in which the population consisted on the one hand of the technical rooms of the maternity hospitals and the operating rooms for cesarean sections and on the other hand the nurses responsible for these maternities.

The observation technique using an observation guide of the WHO model allowed us to collect the data.

Results: Hand hygiene was not properly carried out in the maternity wards of Lubumbashi's public hospitals. Most of the prerequisites before hand washing and hydro-alcoholic hand rubbing were not respected, the prerequisites for surgical hand washing were observed only at 21.4%: wearing of short-sleeved clothing (43.0%), absence of jewelry (78.6%), short nails without varnish and false nails (50.0%). In the absence of hydroalcoholic solution (SHA) (71.4%) for the friction, they used denatured alcohol (28.6%). The duration of soaping and friction was in an interval between 11 to 20 seconds or 42.9% and that of hygienic hand washing was observed at 28.6%.

The duration of surgical and antiseptic hand washing was 21 to 40 seconds to 35.7%. Only 21.4% of the departments surveyed had used the broad-spectrum antiseptic foaming solution, no structure had a sterile disposable brush for hygienic and surgical hand washing, 2/14 departments surveyed had sterile disposable towels, the water used had not undergone bacteriological control and only one service, ie 7.1%, which had non-manually operated bins.

Conclusion: Hand hygiene is not properly carried out in maternity hospitals in Lubumbashi's public hospitals, due to a lack of equipment and knowledge on this practice, equipment must be provided and staff trained in hand hygiene.

Keywords: Hand hygiene, hydro-alcoholic solution

Introduction

Problem statement or Context and rationale

Hand hygiene is at the heart of "Standard" precautions and undoubtedly the most effective measure for the control of infections in general and nosocomial infections in particular. It also applies to situations where specific "isolation precautions" are needed. Its importance is underlined in all multimodal strategies for improving the quality of care, the objective of which is the prevention

of specific infections, such as primary bacteremia in connection with the vascular catheter or urinary infection in connection with bladder catheterization, surgical site infections, and pneumonia associated with mechanical ventilation [1-3].

The World Health Organization (WHO) has made it clear that washing hands with soap and water is the most important hygiene measure to prevent the transmission of infections. This observation

was echoed by the Centers for disease control (CDC) of the United States and by Health Canada in a context of reduction of the transmission of the Severe Acute Respiratory Syndrome (SARS), the influenza virus and other infectious pathogens.

UNICEF estimates that 50% of deaths from diarrhea and 25% of deaths from acute respiratory illnesses could be prevented if hand-washing with soap became standard practice before eating and after using the toilet. Systematic hand washing with soap would greatly contribute to the achievement of the Millennium Development Goals by reducing by two thirds the number of deaths of children under 5 years old, see the Sustainable Development Goals. [3,4].

The microorganisms that cause HAIs are viruses, fungi, parasites and, more commonly, bacteria. These microorganisms are present on the skin or on the mucous membranes of patients (endogenous microorganisms) that the microorganisms transmitted from one patient to another, by the nursing staff or by the patient's environment (exogenous microorganisms) are at the origin of IAS. In most cases, the hands of caregivers are the vehicle of transmission from the source to the patient; however, the patients themselves can also be the source of contamination. Microorganisms are transmitted from patient to patient, from one body site to another, or from the environment to the patient and vice versa [1-3].

Thus, controlling nosocomial infection is above all controlling the spread of germs, mainly bacteria. Their circulation, within the hospital, from one patient to another, from one caregiver to a patient, from one caregiver to another caregiver [5].

Of course, as we will describe in the chapter on factors associated with nosocomial infections, there is also water, or air, which are sometimes blamed in the genesis of nosocomial infections, or medical devices; but the role of the hands, since the now legendary work of Semmelweiss, remains the emblematic determinant of the fight against nosocomial infections. Hand washing after using the toilet and before eating could save many more lives than any vaccine or medical intervention [5].

This is why a Public-Private Partnership for Handwashing with Soap (PPPLM) was created in 2001, which is a coalition of international actors. This coalition is made up of UNICEF, USAID, the World Bank, the Academy for Educational Development, the Center for Disease Control and Prevention, the Water and Sanitation Program (WSP), the London School of Hygiene and Tropical Medicine, Johns Hopkins University School of Public Health, International Center for Diarrhoeal Disease Research, Water Supply and Sanitation Collaborative Council (WSSCC), Colgate-Palmolive, Procter & Gamble and Unilever. Since 2008, the PPPLM has established a Global Handwashing Day which takes place on October 15th every year.

The main objective of this day is to sensitize the populations of the whole world on the consequences of poor hygiene and in particular hand hygiene, in order to reduce the incidence of diarrheal and respiratory diseases [6-7].

In industrialized countries, advances in medicine and hygiene over

the past century have led to a marked increase in the life expectancy of populations. Faced with antibiotics, vaccines and other medications, hand washing may seem too simple to be effective. However, studies have shown its effectiveness in preventing infectious diseases such as gastroenteritis, seasonal influenza or respiratory infections, particularly in schools, where children are most likely to infect [8].

Several studies have also clearly shown that the implementation of structured infection control programs can reduce the number of HAIs at a lower cost. In particular, some studies have shown that similar results can be achieved in countries and health care facilities with limited resources. However, in our environment, no program exists in health establishments as in public settings such as schools, churches and markets.

In the field of research, there is a scarcity of studies carried out in this field, not only for the whole country in particular, but also and especially for the city of Lubumbashi.

The four moments of hand hygiene in all healthcare settings : Before touching the patient or his environment; before an aseptic procedure; after a risk of contact with body fluid and after contact with the patient or his environment [9].

Goals

Main objective

The general objective of this survey is to assess the application of hand hygiene measures in the maternities of public hospitals in Lubumbashi.

Specific objectives

Specifically, the objectives of this work are:

- Evaluate the prerequisites for hand hygiene in maternity wards of Lubumbashi public hospitals;
- Evaluate hand hygiene technique in maternity wards of Lubumbashi public hospitals.

Methods And Techniques

Study framework

As for the other surveys which constitute the whole of this work, the framework of our study consists of the city of Lubumbashi. It is located in the south-east of the Haut-Katanga province of which it is the capital. It covers 747 km² of which 140 km² are urbanized. Its population was estimated in 2006 at 1,500,000 inhabitants with a density of 10,000 inhabitants / km². In terms of health, it is subdivided into 11 health zones (ZS) each having a General Reference Hospital (HGR). Each HGR has a minimum capacity of 200 beds, 15% of which are intended for the maternity ward.

Methodological approach

Type of study

We carried out a cross-sectional descriptive study in the maternities of public hospitals in Lubumbashi.

Study population

The target population of the study consisted on the one hand of the technical rooms of the maternity hospitals and the operating theaters and on the other hand the staff working in the maternities of the public hospitals of Lubumbashi.

Inclusion, exclusion and non-inclusion criteria.

For hospitals, all 11 general referral hospitals and CULs were concerned, was included, any hospital having obtained a frequency of more than 40 deliveries per month and for which the authorities agreed to compare in other words, the hospitals having obtained the score 3 of our inclusion criteria. For staff, was included in the study, all staff working and present on the day of the survey at the public hospital selected for our.

Sampling

This is a non-probability method, the sampling of which was formed according to the inclusion and exclusion criteria. Data collection was carried out in an exhaustive manner in the units of the delivery rooms and the operating rooms.

All referral general hospitals and CULs were involved in the study in total 12 of which 7 were selected according to the inclusion and exclusion criteria.

The observation concerned the availability of materials and products as well as the prerequisites for hand hygiene, while for the staff, a self-administered questionnaire of the WHO model, enabled us to carry out the interview.

Definition of variables

The correct application of the hand hygiene components by staff were variables of interest, including simple hand washing, anti-septic hand washing, surgical hand washing, and alcohol rubbing of the hands.

The availability of hand washing devices and respect for prerequisites for hand hygiene such as keeping short sleeves and the absence of jewelry... were the explanatory variables for this survey.

Collection of data

We used the following techniques: semi-structured interview using a self-administered WHO-style questionnaire that was sent to staff present in the service at the time of the survey ; structured observation using an observation guide for hand hygiene components technique.

Analysis and interpretation of results

We used Epi info version 7 software to analyze the data while using standard statistics to describe our samples and calculate frequency measurements.

Ethical considerations

The protocol was validated by the ethics committee of the University of Lubumbashi, we asked for the staff's agreement for the interview. We sought their voluntary membership to answer various questions.

Results

From this result, we note that the number of women was equal to the number of men surveyed and ¾ of these respondents were nurses. 88.8% of our respondents recognize the existence of a hand washing device against 8.2%. As for their quality, only 11.2% find them to be of good quality Liquid soap was available although it was not a mild liquid soap (97.3%), the use of single-use towels was 49.1%, the non-manual water point was 26.4% and instead,

the use of manual taps that we use and this at 82.7%.

Simple hand washing and antiseptic hand washing are the components most used in these structures according to staff, i.e. 90.9% and 92.7% respectively, while surgical hand washing (47.3%) and hydro-alcoholic friction (16.4%) applies less.

Simple hand washing

Compared to the prerequisites in hand hygiene, this result shows that 42.9% of staff washed their hands while wearing long-sleeved clothing and also had false nails, tinted with varnish or long nails.

The clock was the most available material during our observation in simple hand washing, although it had not been used (9 cases or 62.3%). Other materials were not available and were other things were used for washing hands.

Compared to the four-stroke of the simple hand washing technique, only the wetting hands without wrists and the soaping of the hands which respectively respected 100% and 92.9% The duration of soaping is between 10 - 20 seconds or 42.9% (6 cases) of our study sample followed by the duration of soaping between 20-30 seconds or 35.7% (5 cases).

We observed that the duration of the soaping was mainly carried out in an interval between 10 - 20 seconds or 42.9% of our study sample followed between 20-30 seconds or 35.7%.

Hydroalcoholic friction

For hydroalcoholic friction, 71.4% use hydroalcoholic solutions or gel as material during hydroalcoholic friction while 4 cases or 28.6% use pure alcohol.

The distribution of the products on the totality of the hands was observed on 64.3% while on the totality of the wrists it was 57.1%. We notice that during the hydro-alcoholic rubbing technique the least rubbed areas are the fingernails and thumbs (7.1%) and the backs of the hands (21.5%)

8 staff or 57.1% dry their hands during hydro-alcoholic rubbing and 6 staff or 42% do not apply it.

Surgical hand washing

Compared to the prerequisites for surgical hand washing, this table shows that 21.4% of our respondents do so by wearing a long sleeve outfit, half do it with jewelry and ¼ with long uncles.

Only 21.4% of the departments surveyed had used the broad-spectrum antiseptic foaming solution, no structure had a sterile single-use brush, two out of fourteen departments surveyed had sterile single-use towels, the water used had no no bacteriological control and only one service, or 7.1% had non-manually operated bins.

At the first beat, half do the mwashing hands, wrists and forearms, applying a dose of antiseptic soap, keeping the hands above the elbow and rinsing abundantly the hands, wrists and forearms.

In the second step, the resumption of a second dose of soap was carried out in 28.6%, the intake of the sterile disposable brush was not instead it was a non-sterile multiple-use brush, and the tech-

nique was only met at 28.6%.

In the third time, nothing was respected in relation to the resumption of a third dose of soap, the massage and rinsing of the hands; the maintenance of the position of the hands as recommended during the dressing was rather respected in 2/3 of service.

Antiseptic hand washing

Compared to the antiseptic hand washing prerequisites, we observed that 28.6% of our respondents do so by wearing the long-sleeved outfit, around 1/3 do so with jewelry and 28.6% with long uncles.

Only 21.4% of the departments surveyed had used the broad-spectrum antiseptic foaming solution, no structure had a sterile sin-

gle-use brush, three out of fourteen departments surveyed had sterile single-use towels and only one department, i.e. 7, 1% had non-manually operated trash cans.

The mtoiling of the hands and wrists, abundant rinsing from the fingertips to the wrists, abundant rinsing from the fingertips to the wrists (50%) and taking a dose of soap after wetting (57.1%) were observed in almost half of the services. The tap was not closed with the last used towel and the hands and wrists were carefully dabbed dry and 21.4% of staff from the departments surveyed threw the towels into the trash without touching them.

We find that the average duration of hand washing in hygienic washing is between 40 - 60 seconds or 42.9% against that of 20 to 40 seconds or 35.7%.

Table 1 : Distribution of respondents according to the components of hand hygiene in application by structure

Name structures	Not	Hand hygiene components							
		Simple hand washing		Antiseptic hand washing		Surgical hand washing		Hydro-Alcoholic Friction	
		or	%	or	%	or	%	or	%
UNIVERSITY CLINICS	12	12	100	12	100.0	11	91.6	4	33.3
KAMPEMBA	14	14	100	14	100.0	4	28.5	3	21.4
KATUBA	16	16	100	15	93.7	8	50.0	1	6.2
KENYA	12	12	100	12	100.0	6	50.0	1	8.3
SENDWE	29	29	100.0	20	68.9	10	34.4	4	13.7
SNCC	15	17	94.4	17	94.4	7	38.8	3	16.6
KISANGA	12	12	100.0	12	100.0	6	50.0	2	33.3
Total	110	107	90.9	102	92.7	52	47.3	18	16.4

In view of this table, simple hand washing and antiseptic hand washing are the components most used in these structures according to the staff, i.e. 90.9% and 92.7% respectively, while surgical

corn washing (47.3%) and hydro-alcoholic friction (16.4%) applies less.

Table 2: Proportion of different types of hand hygiene.

Hygiene type	Before treatment (n = 14)		After care (n = 14)		Total before and after care (n = 28)	
	Not	%	Not	%	Not	%
Simple hand washing	8	57.1	11	78.6	19	67.9
Hydroalcoholic friction	1	7.1	3	21.4	4	14.3
Antiseptic hand washing	3	21.4	6	42.8	9	32.1
Surgical hand washing	14	100	12	85.7	26	92.9

In view of all the results, we note that the hydro-alcoholic friction was less applied (14.3%) while surgical hand washing was observed at 92.9% of which 100% before the operation. The finding is that the proportion was high after treatment than before treatment.

These proportions were calculated by relating the number of hand hygiene actions of a given type to the number of hand hygiene actions performed with recommended types of hand hygiene.

Discussion

We obtained three types of essential results in this study which had as objectives to evaluate the prerequisites and the technique of hand hygiene in the maternities of the public hospitals of Lubumbashi.

In view of these results, which described the prerequisites and techniques for simple hand washing, antiseptic hand washing, surgical hand washing and hydro-alcoholic hand rubbing, we can say with certainty that our method of study has allowed us to achieve these objectives that we had set for ourselves.

By a non-probability method, the sampling of which was constituted according to the inclusion and exclusion criteria. The observation concerned the availability of materials and products as well as the prerequisites for hand hygiene, while for the staff, a self-administered questionnaire of the WHO model, enabled us to carry out the structured interview.

Using the techniques and collection tools retained, the data that was collected from all our targets, the collection tools were in line with the collection techniques, anonymity was observed in the processing of the data and the verbal informed consent was obtained. From the above analysis, it emerges that the results of our study are valid and can be extrapolated for public hospitals in Lubumbashi. Knowing that we are not the first to tackle this theme in the scientific world, we compared our results with those of other studies taking into account the three types of results obtained on the four components of hand hygiene which the subject of the study, in particular on their prerequisites and techniques.

The first types of results: interview with health personnel

The number of women was equal to the number of men surveyed and ¾ of these respondents were nurses. 88.8% of our respondents recognize the existence of a hand washing device against 8.2%. As for their quality, only 11.2% find them to be of good quality. Liquid soap was available although it was not a mild liquid soap (97.3%), single-use towel usage was 49.1%, non-manual water point was 26.4% and instead, the use of manual taps that we use and this at 82.7%. Simple hand washing and antiseptic hand washing are the components most used in these structures according to staff, i.e. 90.9% and 92.7% respectively, while surgical hand washing (47.3%) and hydro-alcoholic friction (16.4%) applies less.

In the DRC, the 2013-2014 Demographic and Health Survey (EDS) revealed that one in two households (50%) does not have water, soap, or any other cleaning product to wash their hands. This situation was more frequently observed in rural areas (62%) than in urban areas (37%). This situation seems similar to the public hospitals in Lubumbashi [10].

Maury and his collaborators have shown that the installation of hydro-alcoholic solution (SHA) in an intensive care unit sustainably improves compliance with hand washing. [11].

The hydroalcoholic rubbing is a very effective procedure and in particular active on Gram negative germs, multiresistant bacteria to antibiotics and viruses, provided that the adequate contact time is respected. It is the recommended procedure for the level of surgical asepsis [11-14].

Most studies show, as we do, that the adhesion to hydro-alcoholic rubbing is faster than to washing hands and we wash our hands more often after the treatment than before, because the feeling of having dirty hands is more important at this time and because the reflex to protect oneself prevails [15-17].

We also found that the reasons given are the same in our study.

The second type of results: observations of the prerequisites

In relation to the observation of the prerequisites for hand hygiene, we found that 42.9% of staff washed their hands while wearing the long-sleeved dress and also had false nails, tinted with varnish or long nails.

The clock was the most available material during our observation in simple hand washing, although it had not been used (9 cases or 62.3%). Other materials were not available and were used for hand washing. 71.4% used hydro-alcoholic solutions or gel as material during the hydro-alcoholic rubbing while 4 cases or 28.6% used pure alcohol.

Compared to prior surgical hand washing, we found that 21.4% of our respondents also carried out the long-sleeved outfit, half of them with jewelry and ¼ with long uncles. Only 21.4% of the departments surveyed had used the broad-spectrum antiseptic foaming solution, no structure had a sterile single-use brush, two out of fourteen departments surveyed had sterile single-use towels, the water used had no bacteriological control and only one service, or 7.1% had non-manually operated bins.

Compared to prior antiseptic hand washing, 28.6% of our respondents did so by wearing long-sleeved clothing, around 1/3 did so with jewelry and 28.6% with long uncles. Only 21.4% of the departments surveyed had used the broad-spectrum antiseptic foaming solution, no structure had a sterile single-use brush, three out of fourteen departments surveyed had sterile single-use towels and only one department, i.e. 7, 1% had non-manually operated garbage cans.

While the WHO recommends that all washing stations with ordinary faucets should be banned, even for simple washes. Hygienic hand washing should always require non-manual controls. The disposable paper or non-woven hand towel should preferably be used. [1.18 -20].

Simple hand washing also represents the lowest level of efficacy but its tolerance is good if one respects the rules of good practice and that one uses a suitable soap. It should be limited to situations where the hands are visibly dirty, as it is less well tolerated than friction.

In a study conducted by Maury, 58.1% of staff were unaware that hydro-alcoholic solutions can be used in all situations where the hands are not soiled. The staff seemed to have a good theoretical knowledge (87.2 to 96.4%) of the hand hygiene measures to be adopted before and after the most common actions in the unit, but there was a non-compliance with the hand hygiene in 33.3% of cases. Poor quality of hand washing relating to contamination at the end of the procedure was found in 64.7% of cases and in all the categories observed [3.11].

The third types of results: observation of practice

Compared to the four stages of the simple hand washing technique, only the wetting of the hands and the soaping of the hands which were respected respectively 100% and 92.9%. The duration of soaping was between 10 to 20 seconds or 42.9% (6 cases) of our sample. The duration of soaping was between 20 to 30 seconds or 35.7% (5 cases) and from 10 to 20 seconds or 42.9% of our study sample followed between 20-30 seconds or 35.7% for hydro-alcoholic friction.

The distribution of the products on the totality of the hands was observed on 64.3% while on the totality of the wrists it was 57.1%. We noticed that during the hydro-alcoholic rubbing technique, the least rubbed areas are the fingernails and thumbs (7.1%) and the backs of the hands (21.5%); 8 staff or 57.1% dried their hands during the hydro-alcoholic rubbing and 6 staff or 42% did not apply it.

During surgical hand washing, at the first step, half did the mwashing hands, wrists and forearms, applying a dose of antiseptic soap, keeping the hands above the elbow and rinsing abundantly the hands, wrists and forearms. In the second step, the resumption of a second dose of soap was carried out that in 28.6%, the taking of the sterile disposable brush was not instead it was a non-sterile multiple-use brush, and the technique was only respected at 28.6%.

In the third time, nothing was respected in relation to the resumption of a third dose of soap, the massage and rinsing of the hands; the maintenance of the position of the hands as recommended during the dressing was rather respected in 2/3 of service.

Wetting the hands and wrists, rinsing abundantly from the fingertips to the wrists, rinsing abundantly from the fingertips to the wrists (50%) and taking a new dose of soap after wetting (57.1%) were observed in almost half of the services. The tap was not closed with the last used hand towel and the careful drying by dabbing the hands and wrists was not carried out and only 21.4% of staff from the departments surveyed threw the towels without touching them in the trash.

We also found that the average duration of hygienic hand washing was between 40 to 60 seconds or 42.9% against that of 20 to 40 seconds or 35.7%.

In the literature, it is noted that it is desirable that the hands and forearms should be bare and not wear any object (watch, bracelet, curb chain, multiple rings, etc.), likely to protect a region of the skin. Of the action of cleaning products and / or antiseptics, although the alliance is tolerated. Nails must be short and unvarnished (no false nails) [19].

Our results compared to simple hand washing show the prerequisites and the technique do not meet the standards, while the results of several studies have already clearly shown that a regular and progressive increase in the observance of hand hygiene and parallel to a reduction in the incidence of nosocomial infections (from 16.9% to 9.9%) and that of acquired cases of infection and colonization due to MRSA from 2.16 to 0.93 cases / 10,000 hospital days [21].

And improving hand hygiene adherence through the use of AHS was associated with a reduction in the risk of cross-infection, which translates into a reduction in the overall infection rate and the rate of infection. SARM acquisition [22].

If the recommendations concerning "standard" precautions stipulate that hand washing between each treatment can be carried out successively from one patient to another, for hand washing before and after a treatment, the expected target value would therefore be 100% [13.7].

The results of a study by the Amgar group showed that there is a statistically significant difference between the rates of adherence to hand hygiene before care according to the professional categories. The best rate was noted among student interns (32.4%) while the lowest was observed among physicians (9.3%). In addition, compliance after care is shown to be better among senior technicians and nurses without showing any significant difference according to professional categories [19.23].

Jeanes showed that decorated nails sometimes consist of putting an extension on the natural nail or adding decorative effects. They noticed that a number of epidemics have been linked to this art. They also noted that the infections originate from difficulties in cleaning and maintaining the extensions. And that the decorated nails seem incompatible with clinical care [24].

Therefore, it appears impossible to wash the hands correctly with decorated nails, hence, in the care teams, decorated nails are strongly discouraged. Given that hand washing should be carried out 100% according to the principles and techniques listed above, we conclude that the hygiene of but is not respected in the public hospitals of Lubumbashi.

This failure is likely to favor the spread of nosocomial infections in these hospitals, because it has already shown that the wearing of bands was associated with average rates of microbial contamination ten times higher as well as contamination linked to *S. aureus*, Gram negative bacilli and *Candida* sp. The risk of contamination increased with the number of rings. While the removal of rings and wedding rings during labor and the use of hydro-alcoholic hand hygiene gels reduced the extent of contamination of the hands of intensive care unit staff [25].

Regarding the time of hand washing, it has already been demonstrated that an effective washing, a hand rub must last at least 30 seconds for the simple washing and 60 seconds for the antiseptic washing, or the average duration of a washing of the hands is often less (8.6 seconds in the study of Quraishi, as in our study [26-27].

Another thing to note is that the best results obtained in the prevention of nosocomial infections were obtained by the hydro-alcoholic friction respecting its procedure and its duration of realization. While it is less applied in the public structures of Lubumbashi [28-29].

Factors such as lack of time, lack of equipment / materials and behavior lead health workers to neglect hand hygiene. Although many health workers rate its performance as high [30-32].

In our study, the lack of materials was the first obstacle to the effective performance of hand hygiene.

Conclusion

To conclude, it should be noted that the hygiene practice of but does not apply correctly in the public hospitals of Lubumbashi.

The materials hand hygiene was not available, the prerequisites were not met and the hand hygiene technique was not properly applied in these maternities.

Most of the prerequisites for all components of hospital hygiene were not met. The services surveyed did not have a brush, sterile disposable towels and non-manual waste bins. The water they use in the operating room had not been checked in the laboratory. The duration of hand washing and FHA was below standard.

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