

Factors affecting Compliance to Infection Prevention and Control guidelines, by Nurses at St. Dominic Mission Hospital, Ndola Copperbelt, Zambia

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Abstract

Background: Compliance to infection prevention and control is a major problem worldwide in Health Care Facilities and especially in developing countries, putting patients at higher risk of Health Care Associated Infections, imposing avoidable suffering, longer hospital stay, disability and death on patients; increasing extra costs on healthcare system and wider economy. Health Care Associated Infections in developing countries including St. Dominic's mission Hospital in Zambia are at an increase.

Main objective: To assess factors affecting compliance to infection prevention and control guidelines by nurses at St. Dominic's Mission Hospital, Zambia.

Method: A cross-sectional study was conducted to elicit factors affecting compliance to Infection Prevention and Control guidelines. Data collected by self-structured questionnaire of both closed and open ended questions. Purposeful sample of 30 nurses participated.

Results: 30 nurses participated: 19 females and 11males; aged 21 to 50 years. Majority (82%) diploma Holders, did registered nursing. Findings revealed that (42.2%) had knowledge on use of red containers, (68.5%) used yellow containers correctly. (39.3%) indicated inadequate knowledge, concerning Infection Prevention and Control. Participants' general information about Infection Prevention and Control guidelines availability, who was supposed to comply and when, was adequate and 99% valued the importance of Infection Prevention and Control guidelines. Factors affecting Infection Prevention and Control compliance were: Inadequate materials and equipment (76.6%), workload (47.9 %), shortage of staff and negative attitude 38.3%. Others were: Overcrowding 33%, inadequate knowledge and finance 16%, also lack of supervision and inadequate departmental meetings on Infection Prevention and Control.

Conclusion and recommendation: Despite participants' knowledge on Infection Prevention and Control guidelines, compliance needed to be encouraged through supervision and having departmental meetings.

Keywords: *Infection, infection control, compliance, health care-associated infections guidelines, health care providers, nurses, St. Dominic Mission Hospital, factors affecting.*

Introduction

Purpose and significance of the research: This research has been conducted to assess factors affecting compliance to infection prevention and control guidelines among nurses at St. Dominic's Mission Hospital. When health care associated infections are not prevented, result is serious illnesses, leading to suffering and death of patients, healthcare system is affected in terms of many patients is hospitalized, wider economy and society equally affected negatively as the hospitalized patients become less or un productive.

The significance of this research has added to evidence based researches on factors affecting compliance among healthcare providers, especially nurses. Findings are beneficial to both patients and Health Care Professionals in improving compliance; prevent infections, providing quality health services, preventing avoidable suffering on patients and families, and preserving life.

This research was a reminder to nurses that they have patients' lives in their hands, hence they need to be acquainted, equipped, and emulate Florence Nightingale's observation regarding patient care, which says that the first responsibility to the patient is to do no harm.

Problem to be solved: Compliance to infection prevention and control has remain the major challenge and problem in most countries especially in developing countries, even in Health Care institutions, exposing patients to high risk of developing Health Care Associated Infections, resulting in imposing avoidable suffering on patients and their families, longer hospital stay, permanent disability and death; increasing extra costs on the healthcare system and wider economy. The Health care associated infections are mainly caused by contact with contaminated hands of nurses, equipment (stethoscopes, blood pressure machines), health care interventions (surgery, diagnostic testing or invasive devices), and environmental.

Health Care Providers, mainly nurses are often in contact with patients, and handle different instruments in Health Care Facilities, there-by they can be source of Health Care Associated Infections. This is the reason why nurses should strictly comply with infection prevention guidelines/ standard precautions like washing of hands in between contacts with patients, body secretions, excretions, any invasive procedure, and contaminated equipment (Kozier et al., 2004).

Existing solution to the problem: To combat this problem, infection prevention and control guidelines are in place in most countries, Health Care Associated Infections are preventable through compliance to guidelines, which many times has been very difficult among Health Care Providers (Gould 2009).

World Health organization (WHO), states that, Health care Associated Infections occur worldwide, irrespective of country's level of development; sadly in developing countries are 2-20 times higher than those reported in developed countries (WHO, 2010). Furthermore, Infection Control Africa Network, reported that there are issues related to practices by Health Care Providers that continue to fuel transmission of Health Care Associated Infections in Africa; among them are attitude and behaviour (ICAN, 2011).

Many evidence- based interventions for reducing health care associated infections have been suggested, and Centre for Disease Control has developed specific guidelines aimed at preventing transmission of micro-organisms within hospital facility, (Siegel J. et al., 2007).

In Zambia, a study done at Ronald Ross general hospital in Mufulira (Katowa P. et al., 2007) found out that Health Care Associated Infections are still a major challenge as demonstrated by the increase in wound infections among patients with caesarean section (30%), indicating the need for compliance.

Moreover, in 2010 the researcher had observed that some Health Care Providers in some Hospital in Zambia, showed no interest in complying with Infection Prevention and Control guidelines resulting in spreading of preventable Health Care Associated infections which has been escalating in developing countries (St. Dominic Mission Hospital inclusive); hence the urge to find out factors affecting compliance with Infection Prevention and Control guidelines among Nurses at St. Dominic's Mission Hospital.

Study limitations: Study participants were only nurses; excluded other professionals and support staff. This could result in missing other key informant's rich information on Infection Prevention and Control, from those working at St. Dominic's Mission Hospital.

Due to running out of time during data collection period, some missing responses in the questionnaire could not be followed up; hence important information could have been missed, to make the report richer

Method used

The research was done at St. Dominic's Mission Hospital, Ndola district, Copperbelt province, Zambia. This is the first level Hospital that was recently upgraded from a Health Centre. The Hospital was established 1993, has the bed capacity of 100 and 50 cots.

The research used a cross-sectional quantitative design, rationale being that cross sectional is suitable as it saves time and resources (Saunders et al., 2007).

The research was conducted in August/September 2016. Data was collected at one point in time which was appropriate due to limited time and inadequate resources for the whole research. Collected data gave details on factors affecting compliance of infection prevention and control guidelines among nurses. Findings would assist policy makers in identifying appropriate ways of preventing and controlling health care associated infections.

Purposive sampling, a type of non-probability sampling, which is extremely useful was used to gain useful and rich, also in-depth information about nurses working in male and female medical wards, male and female surgical wards and maternity wards, simply where nurses come in direct contact with patients.

Data collection method was self-administered structured questionnaire of both open and closed ended questions. Questionnaires were hand delivered to 30 nurses and then hand collected, to ensure confidentiality; and data collected were verified for quality. Primary and secondary data were collected; primary data included; social demographic, respondents' characteristics of age and sex, marital status, and number of years in service which assisted in assessing factors affecting compliance, and secondary data looked at guidelines available at the facility.

Strengths of data collection method

The method was easy as respondents were given a self-structured questionnaire only once, which was cheap.

Limitations during data collection period

There was limited time for the researcher to interview and to distribute the questionnaires to a bigger number of participants; hence some missing values were encountered in some questionnaires.

Results

From 30 participants, majority 27(90%) had learnt about Infection Prevention and Control, 20(93%) were familiar with Infection Prevention and Control guidelines, 23 (97.9%) agreed that St. Dominic's Mission Hospital has Infection Prevention and Control guidelines available, and (86%) had Infection Prevention and Control guidelines in their departments. Therefore, results portray knowledge on information about Infection Prevention and Control, and availability of Infection Prevention and Control in the hospital and departments.

Concerning source of Infection Prevention and Control information, (66%) participants received from training (schools), while minority (1%) got from internet and books. Frequency of Infection Prevention and Control meetings, (37%) had it quarterly and (34%) during performance assessment, (20.9%) never attended any Infection Prevention and Control meeting. A great number of participants (96%) knew that every healthcare provider was responsible in implementing IPC guidelines.

For individual Infection Prevention and Control practice; (47%) said that they always practice, while (50%) do it at times; 2.4% rarely implement Infection Prevention and Control.

45% of participants said that Health Care Association Infections had decreased in the year 2012, 17% had an increase of Health Care Association Infections, while 38% did not know anything.

Hands were known to transmit infections more in health facility by (72.9%); and (95.9%) participants knew that hand washing was priority in Infection Prevention Control. Knowledge level was adequate.

Recommendation of gloving as a barrier protection to reduce the risk of contamination during contact with body fluids and when drawing blood was known by 95% participants and 5% mentioned while examining patients.

The research results showed that participants had adequate knowledge; (94.5%) response was that before any invasive surgical procedure, you needed to wash hands, this was strongly

believed; as well as before any procedure (84.4%). However, when you arrive and before leaving work had (50%), which was average knowledge.

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Discussion

Social demographic characteristics of study participants

Total number of study participants was 30 nurses. Their age ranged from 21 to 60 years, majority were 31-35 years. 55% of the study participants were married, reason being that, at this time they had completed their diploma course, as reflected by high number 82% of diploma holders and mostly as registered nurses 57%; having worked between 1-5 years.

Participants' general information about Infection Prevention and Control

Findings revealed that most participants had heard about Infection Prevention and Control during professional training and that they were familiar with Infection Prevention Control guidelines, and that the guidelines were available in their hospital and departments.

Concerning source of Infection Prevention and Control information, majority knew from training (schools), while minority from internet and books. Mostly participants attended meetings on Infection Prevention and Control quarterly or during performance assessment, while (20.9%) never attended any Infection Prevention and Control meeting. Therefore, results shows adequate participants' general knowledge on Infection Prevention and Control, and Infection Prevention and Control guidelines availability in hospital and departments; however, Infection Prevention and Control meetings needed to be strengthened.

Having Infection Prevention and Control guidelines in place was in line with evidence-based interventions for reducing Health Care Associated Infections, and Centre for Disease Control had developed specific guidelines aimed at preventing transmission of micro-organisms within hospital facility (Siegel J. et al., 2007).

Knowledge of nurses towards infection prevention and control

Specific objectives on participants' Infection Prevention and Control knowledge level were: finding out who was responsible in implementing Infection Prevention and Control guidelines, what transmitted infections more in health facilities, when individuals had to practice Infection Prevention and Control, priority in Infection Prevention and Control when providing care to client, when gloving was recommended as a barrier protection, when hand hygiene was done; also what red, black and yellow containers/bin liners in hospital were used for, and when health care providers were complying with Infection Prevention and Control practices.

The findings indicated that 96% of participants knew who was responsible to implement Infection Prevention and Control, and 95.9% that hands transmitted infections was priority in Infection Prevention and Control. 90% of participants knew that every time healthcare providers were supposed to comply with Infection Prevention and Control.

Coming to 'when hand hygiene should be done', most answers proved participants' adequate knowledge, for instance: 'before any invasive surgical procedure' 94.5% strongly agreed to be true, Therefore, reflecting on given results, majority of participants had adequate knowledge, this was as a result of the series of training attended at school, meetings and during performance appraisal.

However, response for washing hands when you arrive and before leaving work, scored only 50.0%, implying that another 50% participants did not practice. This is in agreement with a study by Askarian Mehrdad et al., (2009) among a group of nursing and midwifery

instructors and students on education and knowledge, found that there were poor practices, and stated the importance of continuous education to acquire adequate knowledge to aid compliance to Infection Prevention and Control guidelines (Askarian Mehrdad et al., 2009).

The low response on washing of hands (50.0%) when nurses came for work and before leaving work signified noncompliance to Infection Prevention and Control guidelines. Literature has it that Health Care Associated Infections are potentially preventable and it was possible to reduce the rate through compliance to Infection Prevention and Control, the difficulty came from non-compliance (Gould, 2009).

Inadequate materials and equipment

This ranked on top as factor affecting Infection Prevention and Control. Samuel has supported this fact in a study done on availability of Infection Prevention and Control logistics, stated that, lack of water, and poor quality of available soaps, lack of funds, overworked staff, reduced motivation and increased the spread of Health Care Associated Infections, and reduced compliance (Samuel et al., 2005).

Other studies supported that inadequate equipment, inadequate space, and staff shortage contributes to poor Infection Prevention and Control despite having Infection Prevention and Control guidelines in place (Of et al., 2010).

Workload and shortage of staff, also as factors affecting compliance to Infection Prevention and Control, This was supported with a study conducted by Yassi on shortage of staff and workload, indicating that although the gap between the need for Health Care Providers and the supply was experienced globally, the disproportion was huge, that the regions with the greatest need had the fewest providers: sub-Saharan Africa and southeast Asia together had 53% of the global disease burden but only 15% of the world's Health Care Providers. Moreover, the shortage experienced by countries that can least afford was worsened by Health Care Providers' migration to high-income countries, especially in sub-Saharan Africa (Yassi A et al., 2009).

WHO had also indicated that 36 out of identified 57 countries with critical shortages of Health Care Providers were in Africa (WHO, 2010).

Overcrowding of patients and limited space was also mentioned as a factor (33%); less facilities was emphasized by 65% respondents saying that their departments had less facilities for Infection Prevention and Control. 63.2%, of participants indicated that bed occupancy compromised good Infection Prevention and Control practices, with more emphasis that overcrowding affected Infection Prevention and Control, while 28.6% participants disagreed to this fact. This truth is supported by Florence Nightingale, first nurse on record who attempted to prevent infections during her work in the Crimean War, by recognizing that placing a large number of patients in limited space contributed to spreading of infections, introduced many hygiene protocols to be complied with (Perry, 2007).

Overcrowding as a risk factor for Health Care Associated Infections has been confirmed by Hamel, in a retrospective cohort of adult patients, with exposures characterized as total daily roommate exposures and daily unique roommate exposures (Hamel M et al., 2010).

Brown and Arshak agreed to the fact that high bed occupancy, low staff-to-patient ratio contributed to spreading of Health Care Associated Infections (Brown, Crawford et al., 2008), and (Velusamy, Arshak et al., 2010).

Attitude and practices regarding Infection Prevention and Control guidelines among Health Care Providers were still low, revealed by Ajay, after conducting a study on hand hygiene among Health Care Providers. His conclusion was that there was need to address understanding and attitude to Infection Prevention and Control guidelines (Ajay K. et al., 2012).

Inadequate finance was among factors affecting compliance to Infection Prevention and Control. This is in agreement with Robinson who stated that Africa carried 25% of the world's disease burden, yet had only 3% of the world's Health Care Providers and 1% which was

close to nothing of the world's economic resources to meet Infection Prevention and Control challenge (Robinson M, 2008).

Recommendation from participants, on how best to improve compliance to Infection Prevention and Control guidelines

The following were among participants' responses on how best to improve Infection Prevention and Control compliance:

- More supplies of material and equipment 72% participants,
- Training in Infection prevention and Control 65% participants,
- Increase number of staff 62% participants,
- Encourage more Infection Prevention and Control departmental meetings,
- Avoid overcrowding of patients 55% participants,
- Intensify supervision 52% participants.

Almost all participants' suggestions, were answering to the problems at hand (the factors affecting compliance to Infection Prevention and Control guidelines).

Study limitations

Study participants were only nurses; excluded other professionals and support staff. This could result in missing other key informant's rich information on Infection Prevention and Control, from those working at St. Dominic's Mission Hospital.

Due to running out of time during data collection period, some missing responses in the questionnaire could not be followed up; hence important information could have been missed, to make the report richer with information.

Conclusion and recommendations

Conclusion

Based on the findings, the following were drawn: Most participants had adequate knowledge on Infection Prevention and Control, and on factors affecting compliance, among them were: inadequate material and equipment, workload, shortage of staff and overcrowding of patients. Other factors included by participants: lax supervision and inadequate departmental meetings on Infection Prevention and Control.

Recommendations

Recommendations were based on findings from the research, and analyzed data.

To healthcare providers (Nurses) at St. Dominic's Mission Hospital

Nurses are commended for the majority's adequate knowledge on Infection Prevention and Control issues. However, the following are some recommendations and suggestions that need to be implemented by nurses:

- Should comply with hand washing every time they arrive for work and before leaving work, as the practice at this time is low.
- Should continue working on improving positive attitude more and more, so that the percentage of negative attitude keeps reducing. Positive aids self motivation, despite workload.
- Need to read more on Infection Prevention and Control guidelines in order to differentiate properly different disposal methods, and be able to dispose wastes using appropriate containers.
- Should avail themselves for departmental meetings when called upon, so that they continue enriching one another on Infection Prevention and Control deliberations, to improve quality services.

To St. Dominic's mission hospital management

The hospital is commended for having Infection Prevention and Control guidelines in place, and being used in various departments. The following were suggestions and

recommendations, so as to help nurses and other healthcare providers improve on Infection Prevention and Control compliance:

- Need to supply adequate materials and equipment for Infection Prevention and Control guidelines implementation.
- Should encourage capacity building in Infection Prevention and Control through workshops for most nurses; the pictures showed a large number never attended any workshop, except when they were at training school.
- Should continue to lobby for more nurses from the Ministry of Health, in order to ease workload and be able to offer quality care to the patients.
- Intensify on supervision in deferent departments focusing on Infection Prevention and Control compliance, and be able to help nurses fill in missing gaps for Infection Prevention and Control compliance.

To the ministry of health

The Ministry of Health is congratulated for continuous efforts being made on measures to improve health services to the society, and recognize more and more the needs of healthcare providers.

However, the ministry should support and fund more research on Infection Prevention and Control, to see whether other health facilities in Zambia have similar drawbacks, also that researchers would be able to explore more factors that affect Infection Prevention and Control, and be part of the solution, by providing evidence based information.

A map showing Ndola, in Ndola district, Copperbelt Province, Zambia where the research was conducted

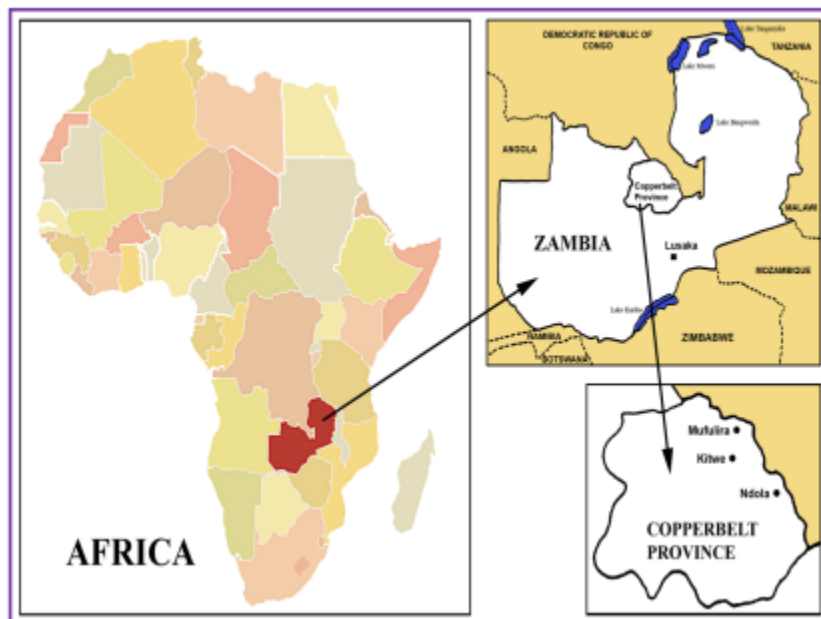


Table 1. Participants' responses on when hand hygiene should be done.

Statement	Strongly agree	Agree	Disagree	Strongly disagree
When you arrive and before leaving work	(50.0%)	(50.0%)	-	-
Before any invasive surgical procedure	(94.5%)	(5.5%)	-	-
Before any procedure	(84.4%)	(15.6%)	-	-
Immediately after removal of gloves	(68.1%)	(31.9)	-	-
Before direct contact with next patient	(75.0%)	(23.9%)	(1.1%)	-
Only when you see them physically dirty	(4.3%)	(12.8%)	(35.1%)	(47.9%)
Only when there is soap to use	(1.1%)	(8.7%)	(28.3%)	562.0%)

Table 2. Factors affecting compliance to infection prevention and control.

CHARACTERISTIC	%
Shortage of staff	38.3%
Work load	47.9%
Inadequate finances	16.0%
Inadequate materials and equipment	76.6%
Inadequate knowledge	17.2%
Negative attitude of health care providers	38.3%
Overcrowding of patients and limited space	33.0%

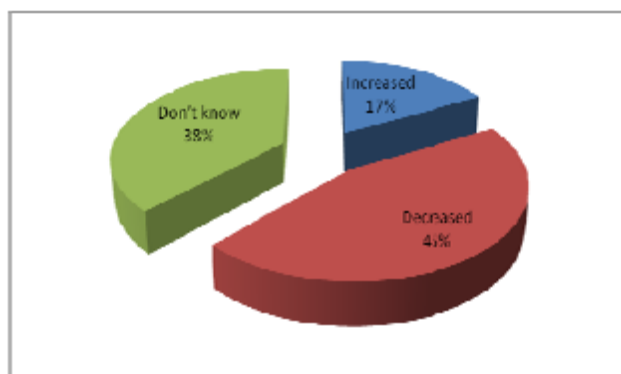


Figure 1. Health care associated infections (HCAIs) at St. Dominic's Mission Hospital, year 2012

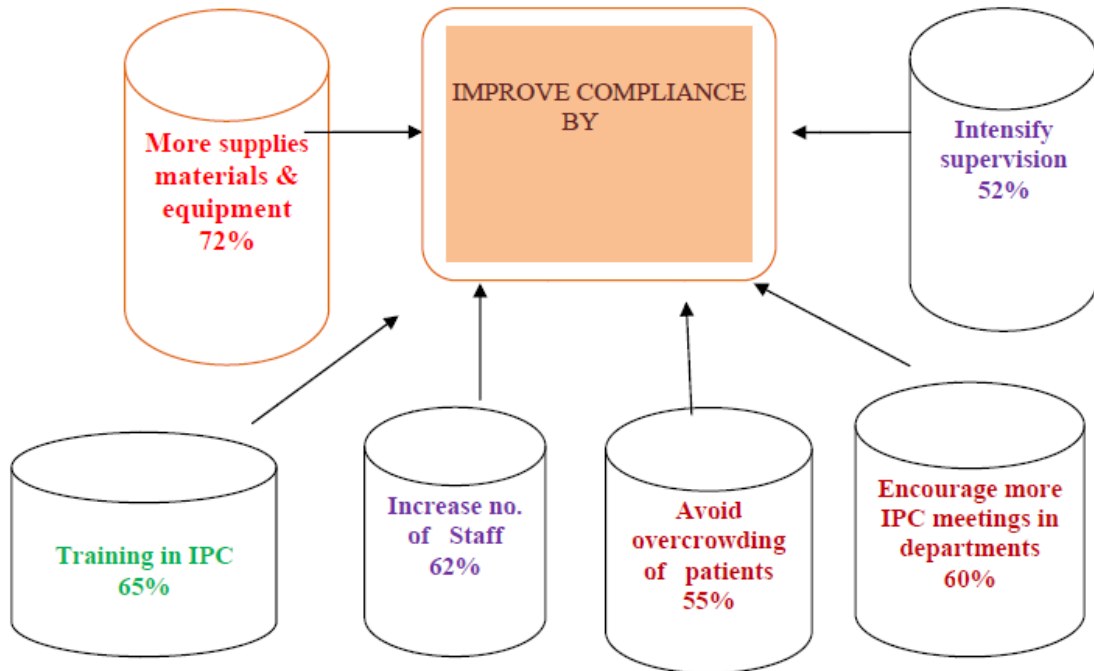


Figure 2. Recommendation from participants, on how best to improve compliance to IPC guidelines



Figure 3. Factors affecting infection prevention and control compliance

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