

**FACTORS INFLUENCING INFECTION PREVENTION AND CONTROL AMONG PATIENTS AND THEIR RELATIVES ON THE ADULT SURGICAL WARD AT THE UNIVERSITY TEACHING HOSPITAL.**

**Mphande Moses, Katiba Aubrey, Mulwani Diana Bubala, Musonda Chanda, Nyengele Esther and Wahila Ruth**

University of Zambia, Nursing Sciences, Faculty Member Zambia

**ABSTRACT**

Infection Prevention (IP) and control is a programme which prevents cross infection between patients/relatives and health professionals and vice-versa. Approximately 5% of all patients develop an infection during their stay in the hospital (Conlone and Syndman, 2000). Patient and relatives participation in IP and control is a key component in health care provision as they are the core players in their own care; hence the need for consented infection prevention and control practices among patients and their relatives in addition to measures carried out by health care professionals. Despite efforts by the Ministry of Health in implementation of IP and Control measures among patients and their relatives during their hospitalization, there is still an increase in nosocomial infections.

The aim of this study was to determine the factors that influence infection prevention and control among patients and their relatives on the adult surgical wards at the University Teaching Hospital. It was hypothesized that there is a relationship between knowledge, availability of materials and utilization of IP and control measures by patients and their relatives.

This study was a descriptive cross section research design that was designed to discover new knowledge as little was known about factors that influence infection prevention and control among patients and their relatives at the University Teaching Hospital, Lusaka. A semi-structured interview schedule was used to collect data from a sample of 169 respondents aged 18 years and above. Statistical package for social science (SPSS) version 20 computer programme was used to analyse the information.

Findings of the study revealed that the majority 92.3% (156) of the respondents had heard about IP and Control measures. The commonest source of information on IP among those that had heard about it was both the media and health care professionals. Majority 98% (148) of the respondents who had utilized IP and control measures also indicated that they had positive attitudes towards IP and control measures. The knowledge levels on IP among respondents were moderate and most 98.9% (86) of the respondents had positive perceptions towards IP and control.

In conclusion, this study nevertheless revealed that utilization of IP and Control measures is affected by both status and attitude of patients and/or their relatives. Based on the findings, the

main recommendation to the Ministry of Health is that it should document the IP and control protocols in Zambian local languages to help patients and relatives in hospitals to understand them and provide an emphasis on the need for adequate IEC on IP by the health care professionals.

**Keyword:** Infection Prevention, Nosocomial Infections, Adequate IEC

## **INTRODUCTION**

Infection is the entry and development or multiplication of microorganism such as bacteria, viruses, and parasites that are not normally present within the body (Caveney, et al., 2012). An infection may be subclinical or be clinically apparent, may remain localized, or may become systemic (body wide). Microorganisms that cause infections are not in the category of those that live naturally in the body. For example, bacteria that normally live within the mouth and intestine are not infectious.

There are three interactive factors that cause disease of all types, including; the Environment, the Host and the Agent factors. The agent factors are the microorganisms, which cause diseases in the host. These can either be either living or non-living. Living agents are called biological agents or vectors; these can be bacteria, viruses, rickettsia, yeast, fungi and parasites (Chanda, 2004).

The host is the person who suffers from the disease which follows the entry of microorganisms into his/her body system(s). The factors, which may influence the host defence mechanisms, include: age, sex, general mental and emotional health, amount and duration of exposure to infection, the person's natural immune mechanisms, specific immune antibodies, secretion currents, natural protective qualities and environment (Chanda, 2004). The host however, plays a pivotal role in ensuring infection is prevented and not spread to other persons by maintaining cleanliness of the body and hand washing after handling dirty substances and after using the toilet (Massachusetts Department of Public Health, 2007). If already infected, the host can ensure that they seek health care, adhere to treatment and medical advice. IP and control of nosocomial infection requires awareness by all health care providers, patients and their relatives. The use of aseptic techniques during the provision of care in the hospital environment by patients and their relatives significantly prevents these infections.

The environment is the place where microorganisms are found and can be transferred in a variety of ways from one patient to another, patient to relatives and from the hospital staff to patients and vice versa. Many factors promote infection among hospitalized patients which include decreased immunity among patients, improper sterilization of instruments and dressings before surgery, increasing variety of medical procedures, crowded ward population and poor infection control practices. Surgical wound infections are the most costly of all nosocomial infections although some are clearly preventable for example invasive procedures such cannulation can act as ways in which microorganisms can be introduced into the patient's body if the health care professionals do not follow aseptic techniques (Conlone and Snyderman, 2000).

The patients, relatives and health care providers all make up a strategic health care team which collaborates to provide effective infection prevention for patients. Hospital acquired infections, besides morbidity and mortality, also prolongs the hospital stay of patients, increases bed occupancy rate and there by puts undue pressure on already strained resources of the hospital, patients, community and the country (Hemchandra, n.d).

Approximately 5% of all patients develop an infection during their stay in the hospital. These hospital-acquired infections are known as nosocomial infections (Conlone and Snyderman, 2000). Patient and relatives participation in IP and control is a key component in health care provision as they are the core players in their own care; hence the need for consented infection prevention and control measures among patients and their relatives in addition to measures carried out by health care professionals. Nosocomial infections impacts patient and client outcomes across the health-illness continuum. The impact includes both morbidity and decreased quality of life. Health care providers and clients are exposed to infection through inadequate infection prevention and control practices (Baker, 2004).

Infection prevention and control maximize patient outcomes and are part of every government's responsibility to provide effective, efficient and quality health services. The Government of Zambia through the Ministry of Health and its Cooperating Partners developed the Zambian Infection Prevention Guidelines in 2003. This was after realization that infection prevention was a critical component of quality health care. The Zambian Infection Prevention Guidelines (2003) specify the Infection Prevention Principles for health care workers as follows;

- Consider every person (client or staff) infectious
- Hand washing which is the most practical procedure for preventing cross contamination (person to person)
- Use barriers: Personal Protective Equipment (PPE) such as protective goggles, face masks, aprons if splashes or spills of blood or body secretions or excretions are anticipated
- Use safe work practices such as not recapping or bending needles, safely passing sharp instruments and disposing sharps in a puncture proof container
- Process instruments and other items that come into contact with blood, body fluids, secretions and excretions
- Dispose contaminated instruments and contaminated waste thoroughly and properly
- Isolate patients only if secretions or excretions cannot be contained (MoH, 2003).

There are no specific IP policies for patients and their relatives despite that their participation in IP and control which is a powerful tool to achieve improvements in the case of the patient. Even though there are no specific IP guidelines developed for patients and their relatives, health care providers are mandated through training to guide patients and relatives in adopting IP practices. This is mainly achieved by educating patients and their relatives on the IP and control measures that they could also participate in. If the education is not emphasized patients and their relatives may practice IP and control measures either correctly or incorrectly.

Nosocomial (hospital-acquired) infections are a significant problem throughout the world and are increasing (Alvarado 2000). America and sub-Saharan Africa (Lynch et al 1997). Many of these infections are serious and sometimes fatal (Weston, 2008). Nosocomial infections are still a major challenge in Zambia as demonstrated by the increase in wound infections among patients admitted to Surgical Wards at UTH which is now 0.7% as of June 2014 from 2012 December which was at 0.3%. The increase in the incidence could be attributed to the host (patients/relatives) as they are the core carers of their health care as observed by Peck et al (2010) that due to under staffing of registered nurses in Zambian hospitals, the rates of infection in the surgical wards are high; this could also be attributed to the fact that some of the care in terms of cleaning wounds is delivered by patient's relatives.

Creating an effective patient education program in our daily practice as nurses may seem time-consuming at first, but once in place, it can save time and other resources directed at treating nosocomial infections, as the giving of information to patients and their relatives will enable them practice IP and protect themselves from hospital acquired infections. Good communication with patients and their relatives is the cornerstone of effective patient education. The fact that there has been no IP and Control guideline of patients and their relatives during hospitalization has evoked our interest in finding out the knowledge, attitudes and practices of IP and Control among patients and their relatives.

There are a number of factors that are associated with knowledge, attitude and practice of patients and their relatives on infection prevention. These maybe categorized into three broad categories which are social economic (education level, Myths, social background, age, sex and peer pressure from other patients and relatives), service related (staffing levels of health personnel, attitude, material resources, supervision by staff and work load of staff) and disease related factors which are also highly influenced by their belief about the disease and their health and hence will include (Susceptibility to disease, nature of disease and severity of disease)

The researchers adopted the health belief model for their study because the model addresses the relationship between a person's belief and behaviour. model will assist the researchers to identify the factors that influence the patient's and their relatives' participation in IP and control measures.

Modifying factors such as knowledge, age, sex, and education will influence the patients and their relatives' perception towards susceptibility and the seriousness of hospital acquired infections. If patients and their relatives believe that they are able to acquire nosocomial infections during hospitalization, they are likely to utilise IP and control measures. Modifying factors can also lead to patients and their relatives seeing the perceived benefits of utilizing infection prevention and control measures minus the perceived barriers which will motivate patients and their relatives to accept them.

Understanding factors that influence infection prevention and control among patients and their relatives is essential in identifying areas of improvements in ensuring that patients and relatives participate effectively in IP and control measures thereby reducing hospital acquired infections. Most researches have been done on the environment (health care workers and hospitals) but no study has been done on the host (the patients and relatives). There is insufficient knowledge designed on the host part on infection prevention and control despite there being a connection between the environment and the host according to the epidemiological triad in addition to the fact that the host spends most of the time in the environment during the provision of health care. Findings from this study will therefore be used to create a new body of knowledge which will be used to influence hospital policies in introducing infection prevention and control measures to patients and relatives on admission and throughout hospitalization in the planning and implementation of quality health care.

#### **AIM OF STUDY**

The main objective of the study was to determine the factors that influence infection prevention and control among patients and their relatives on the adult surgical wards at the University Teaching Hospital.

#### **MATERIALS, METHODS AND RESULTS**

This study is a descriptive cross section research design. The researchers used a non-experimental study because no interventions or manipulations were carried out on both the environment and the respondents. The study was designed to discover new knowledge as little is known about factors that influence infection prevention and control among patients and their relatives. A descriptive study design was more likely to describe the knowledge levels and the extent to which infection prevention and control measures are utilised by patients and their relatives during hospitalization. The study was conducted in a natural setting which is the University Teaching Hospital, the biggest hospital in Zambia and is the oldest third level referral hospital in the country where all patients who require specialized medical care from all over the country are referred to. It is located in the capital city of Zambia, Lusaka approximately 4km east of the city centre. The researchers decided to choose UTH as it has patients from all levels of society throughout Zambia, thus giving a good sample for generalizing the findings of the study. The target population were male and female respondents (patients and their relatives) hospitalized on the adult surgical wards at UTH. The accessible population consisted of adult male and female respondents aged 18 years and above who were hospitalized for at least 48 hours at the time of the study. This is because at that time they were expected to have been orientated to the hospital environment, ward routines and given appropriate information, education and communication. It is envisioned that individuals, in this case, patients and their relatives who are 18 years and above are mature enough to carry out their own care as well as that of others.

A probability sampling method using the lottery technique of simple random strategy was used to select the sample. This method allowed each element in the population an equal independent chance of being selected and therefore left no room for biases. A list of all members of that

population was made and a number assigned to each member of that population. This sampling frame was updated every day without replacement in order to avoid the possibility of patients admitted for a long time or those transferred from one surgical ward to another from being picked and re-interviewed on consecutive days. However, to be able to obtain a clear and true picture, all health care providers admitted and their relatives were not included in this research.

The average number of hospitalized patients averaged to 256 hospitalized patients per month. Therefore using the formula for calculating sample size for known population:

$$S = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P (1-P)}$$

Where:

- **S** is Sample size
- **X** is the z-statistics for the desired level of confidence; therefore  $Z = 1.96$  for 95% confidence level
- **N** is Total population is 256 patients
- **P** is the margin of error which is 0.5
- **d** is the variance( standard deviation) which is 0.05

The final sample size was **169**

A semi structured interview schedule was used to collect data from the respondents. The semi structured interview schedule had both open and closed ended questions. The structured interview schedule was divided into 5 sections (A, B, C, D and E) which aimed at eliciting demographic data, information on knowledge on IP and control measures, information on perception on IP and control measures, the availability of materials that patients and relatives use in IP and control and the utilisation of IP and control measures. The tool was not too long and the researchers were the ones who strictly collected this data.

In this study, data from the respondents was collected through an interview in a private environment to provide confidentiality and the respondents remained anonymous to the researchers and the general public, All the responses from the respondents where noted down on the interview schedule to avoid missing out any information. The interviews were conducted during working hours from 08:00 to 16:00hours and it took approximately 15 minutes to interview each respondent.

After every interview the researchers went through the semi-structured questionnaire to check for completeness, accuracy, internal consistency and legibility. The collected data were both qualitative and quantitative from a semi-structured questionnaire. For statistical analysis of quantitative data, responses were analysed by creating codes that were entered on the data master sheet. The responses were counted then aggregated using SPSS software version 20.0. For qualitative data, responses from the open ended questions were read through thoroughly and answers were grouped together according correct and incorrect responses as regard to infection prevention and control for further analysis. The groups of answers were coded and the codes were entered in SPSS software (1 for correct responses and 2 for incorrect responses). This

helped the researchers identify the factors that influence infection prevention and control among patients and their relatives during hospitalization.

Chi-square was used to test association between qualitative variables and the outcome. The qualitative variables being, knowledge of IP and control measures, perception of IP and control, availability of IP materials. The cut off point for statistical significance was set at 5%, only  $p$  values of 0.05 or less were considered statistically significant there by rejecting the null hypothesis.

The demographic characteristics of the respondents in terms of age, gender, educational level, marital status, religion, employment status, capacity in the hospital at the time of study were as follows; Most 38.5% (65) of the respondents were aged 30-41 years followed by those aged 18-29 years 45 (26.6%), while more than half 60.9% (103) of the respondents were females and 39.1% (66) were males. Regarding educational level of respondents, 46.2% (78) had obtained primary education as the highest level, followed by 32.5% (55) of respondents who had attained secondary qualification. More 66.3% (112) were married while 17.8% (30) were single. The number of the respondents who were self-employed were 45.6% (77) followed by 39.6% (67) who were unemployed. Lastly, more than half 58.6% (99) of the respondents were patients, while 40.8% (69) were relatives.

Data collected which aimed at eliciting knowledge on IP and Control measures, how patients and their relatives acquire information on infection prevention and control and whether health care professionals avail the information on IP and control measures to admitted patients and relatives revealed the following; Majority 92.3% (156) of the respondents stated that they had heard about infection prevention and control measures and only 7.7% (13) said they had not and out of the 156 respondents who had heard about infection prevention and control measures, 37.2% (58) indicated that the source of IP information was the health care professionals and media and majority 93% (145) of the respondents indicated that they understood the importance of IP and control measures, out of the 145 respondents who gave reasons for why IP was important, 132 gave reasons that were correct in relation to IP while 13 gave reasons that were wrong. Out of the 156 respondents who had heard about IP and control, 23.08% (36) indicated that they had discussed IP with health care professionals during their hospital stay, out of the 36 respondents who stated that they had discussed IP information with health care professionals, 83.3% (30) explained the information and of the 156 respondents who heard about IP and control, 33.3% (52) indicated that they had seen documentation on IP on the ward, out of the 52 respondents who had indicated that they had seen documentations on IP and control, 76.9% (40) stated that they understood the documentation, Out of the 156 respondents who had heard about IP and control, only 1.9% (3) had been availed with a booklet on IP and control measures during their hospital stay. Out of 156 respondents who heard about IP and control, majority of the respondents 99.4% (155) were of the opinion that IP and control measures were necessary. Out of the total number of respondents data indicated that majority 98.2% (166) were of the view that participation in their own care would improve the quality of health care being received and Majority 90.5% (153) expressed their interest in learning about their own diagnosis.

Out of the 156 respondents 56.4% (88) stated that IP and control materials were available on the ward while 43.6% (68) indicated that materials of IP and control were unavailable and out of the 68 respondents who indicated that materials were not available, 97.1% (66) stated that no explanation was given to them by health care professionals for non-availability of materials and of these majority, 96% (65) gave correct IP and control materials they use on the ward despite not being provided by the hospital. Of the respondents who indicated that IP materials were available on the ward, 86.4% (76) indicated that they used 2 to 4 types of materials and more than half 55.7% (49) indicated that the IP and control materials were adequate for every patient on the ward. Out of the 156 respondents who indicated they heard of IP and control, 63.5% (99) stated that the IP and control materials are not available on the ward at all times and more than half 54.5% (85) respondents indicated that they provided the IP and control materials by themselves.

Majority 89.7% (140) of the respondents stated that IP and control measures were carried on their ward environment by the health care providers. Out of the 16 respondents who indicated that IP and control measures were not applied in the ward environment, 43.8% (7) related the reasons to the hospital whilst 31.3% (5) gave no reasons. The researchers sought to determine the utilisation of infection prevention and control measures by the respondents, to find out whether patients and their relatives participate in IP and control measures during hospitalization. The majority of the respondents 99.4% (155) indicated that they had participated in IP and control measures.

Further the researchers analysed the relationship among the study variables and the following data was arrived at, most 77.5% (55) who had attained primary level of education had moderate knowledge on IP and control measures with the  $p$ -value = 0.598 which was not significant and most 94.4% (68) of the respondents who had attained primary level of education indicated a positive perception on IP and control measures with the  $p$ -value = 0.31 (not significant). Out of the 151 respondents who stated that they utilized IP measures, 55% (83) outlined that the availability of materials to respondents was moderate. The  $p$ -value = 0.274 (not significant) however, of the respondents who had indicated that they utilize IP and control measures, 98% (148) gave an impression of having a positive attitude towards IP and control measures with the  $p$ -value = 0.012 (significant). Majority 75% (114) of the respondents who gave an impression of having a positive perception towards IP and control measures had moderate knowledge on IP and control measures. The  $p$ -value = 0.002 (significant) and most 98.9% (86) of the respondents who were patients seemed to have positive perception on IP and control measures with the  $p$ -value = 0.001 (significant). Majority of the respondents 98.6% (84) who were the patients stated that they utilized IP and control measures with the  $p$ -value = 0.002 (significant).

## **DISCUSSION**

The general objective of the study was to determine the factors that influence infection prevention and control among patients and their relatives on the adult surgical wards at the University Teaching Hospital.

The research findings are based on the responses from a sample of one hundred sixty nine (169) respondents who were admitted patients and their relatives using a semi-structured questionnaire, which were drawn from the University Teaching Hospital. The sample included admitted male and female patients and their relatives aged 18 years and above.

Most 77.5% (55) of the respondents who had moderate knowledge on IP and control measures had attained primary level of education. This could be due to the fact that the majority of respondents interviewed had attained primary level of education. A positive impact of education on overall knowledge levels can be observed as the level of knowledge increases with the level of education attained Kumar, et al (2000). However, there is no statistical significance between knowledge and level of education of respondents as indicated by the  $p$ -value = 0.598 and most 94.4% (68) of the respondents who attained primary level of education indicated a positive perception on IP and control measures. This could be attributed to data which shows that out of the 169 respondents, 46.2% (78) had obtained primary education as the highest level, followed by 32.5% (55) of respondents who had attained secondary qualification. The higher the educational level the easier it is for one to assimilate issues and concepts (Bandura, 1990). From the data, respondents who attained college and university education were few compared to the primary level, hence the small percentage of positive perception and no negative perception. However a conclusion can be made that there is no relationship between level of education and perception as the  $p$ -value = 0.31.

Out of the 151 respondents who utilized IP and control measures, slightly more than half 55.0% (83) showed that IP materials were moderately available on the ward, this could be related to data which shows that out of the 156 respondents who heard about IP and control measures 56.4% (88) stated that IP and control materials were available on the ward while 43.6% (68) indicated that they were not, therefore this shows that the availability of IP and control materials enables patients and relatives to implement IP and control measures. However there is no statistical significance between utilisation and availability of material as indicated by the  $p$ -value = 0.274, however, the respondents who had indicated that they utilize IP and control measures 98% (148) gave an impression of having a positive attitude towards IP and control measures with a significant  $p$ -value of 0.012, this shows that there is a relationship between utilization and perception. This could be supported by a research conducted in the USA by Lee, et al (2001) on the association between perceived provider discrimination, healthcare utilization and health status in racial and ethnic minorities, in which the results indicated that significantly higher levels of perceived provider discrimination and poorer health were reported by African Americans, Hispanics and Asians than by non-Hispanic whites in which the model revealed poor health to be significantly mediated by two paths: (1) by perceived provider discrimination and (2) by perceived provider discrimination through unmet need for healthcare utilisation, which showed that there is a relationship between perception and utilisation.

The relationship between perception and knowledge of respondents on IP and control measures, most 75% (114) of the respondents who gave an impression of a positive perception had moderate knowledge on IP and control measures with a  $p$ -value = 0.002. This is an indication

that there is a relationship between perception and knowledge. There is a more radical way of understanding the connection between perception and knowledge. The idea would be that knowledge is to be explained, in the first instance, by reference to its sources. Clearly, there are many different ways in which knowledge comes to be but an absolutely basic source of knowledge is perception. So we now have the proposal that 'our fundamental understanding of knowledge is as what is yielded by perception in certain circumstances' (Cassam, 2007).

Majority 98.9% (86) and 98.6% (84) of the respondents who were patients gave an impression to have a positive perception and had utilized IP and control measures respectively. There is a relationship between status of the respondent (being a patient or a relative) and perception also between capacity and utilisation of IP and control measures during hospitalisation. Thus, by implication, patients are mostly the first ones to receive information on IP and control measures and how it affects their health, therefore they develop a positive perception and utilise IP and control measure in order for them to have quick recovery. These results were of statistical significance as the  $p$ -value was 0.001 and 0.002 respectively (significant).

Out of the 156 respondents who had heard about IP and control, 23.08% (36) indicated that they had discussed IP with health care professionals during their hospital stay, while 76.92% (120) stated that they had not. It is vital for patients and their relatives to receive information on IP and control measures because when they know the measures they are likely to practice, however these results show that majority 76.92% (120) of the respondents did not receive any information. There is need for health care providers to educate patients and their relatives on IP and control measures.

Findings of this study further showed that out of the 75 respondents who indicated that IP materials were not available on the ward, majority 97.3% (73) stated that no explanation was given by health care providers for the non-availability of IP materials. These results imply that there is need to educate health care providers on the importance of communication on matters of interest to patients and their relatives. The researcher's therefore conclude that knowledge, perception and availability of IP materials have an association with patients and their relative's utilisation of IP and control measures during hospitalisation.

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