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Adherence to Infection Prevention and Control Guidelines among Nurses in Thika Level 5 Hospital.

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Abstract
Background; Hospital acquired infections (HAIs), also referred to as Nosocomial infections refer to when a patient gets an infection within the healthcare facility which was not the primary reason for admission. Causes of HAIs include; bacterial, viral, fungal, and parasites in nature.
Material and methods; The study adopted a cross-sectional analytical design, the variables under investigations were described. It utilized self- administered questionnaire for data collection among nurses working at Thika level 5 Hospital. The sampling method was census sampling. Data analysis was done using SPSS version 24.0.
Results majority of the participants were female, representing 87.5% (n=56), while males were 12.5% (n=8). As for marital statuses, majority were married i.e. 68.8% (n=44), 25% (n=16) were single, 1.6% (n=1) were divorced and 4.7% (n=3) were widowed. Concerning the professional qualifications of the participants, majority were diploma holders, which represented 78.1% (n=50), further shows that, majority of the participants (78.1%, n=50), had trained in government institutions, 17.2% (n=11The male participants were 0.946 times more likely to have good compliance compared to their female counterparts (OR=0.946, CI [0.536-1.670]). However, these results were not statistically significant at χ2 (1, N=64) =0.040, p=0.842. Results of the Spearman correlation indicated that, there was a positive association between ages of the participants and compliance to IPC guidelines, r (62) = 0.19, p=0.126. Nonetheless, chi squared tests found no statistically significant association between ages of participants and compliance to IPC guidelines at χ2 (3, N=64) =7.836, p=0.076.

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I. INTRODUCTION

Infections prevention and control is the cornerstone of any functional health care system. Globally, there has been rampant change in infections manifestation pattern and bacterial multiple resistance to antibiotics. The health care providers need to embrace evidence-based practices towards infection prevention and control with the aim of preventing health care workers, patients and clients from hospital acquired infections. [1] In Africa, the burden of HAIs is substantial and a safety concern for both patients and healthcare professionals with a prevalence of 5.7% - 45% and 50% or more in intensive care units. [2]Hospital acquired infections (Nosocomial) is when a patient gets an infection within the health care facility which was not the primary reason for admission. Causes of HAIs include; bacterial, viral, fungal, and parasites in nature. The commonest modes of transmission are body contact, airborne and droplet (cite). HAIs leads to prolonged period of admission, extended use of antibiotics and more cost and extended period of recovery (Center for Disease and Control, CDC[3]). Patients as well as health care givers are more likely to acquire nosocomial infections, by transmission of common microbes via hand and equipment's among others unhygienic practices. Blood stream infections and Hepatitis A, B & C outbreaks have been associated with lapses in infections control practices; Hand hygiene and environmental cleanliness (cite). Various methods of infections control measures are recommended by the (CDC) that include Hand hygiene practice, proper catheter care, patient and health care workers education; to minimize infections.[4]. Suffering and death for most patients are attributable to health care associated infections (cite). Unsafe injection practices result to 21 million cases of Hepatitis B virus and more than 200,000 cases of HIV/AIDS infections globally, while in United States of America (USA) there are 40,000 to 80,000 deaths related to hospital acquired infections [5] Establishing factors influencing compliance to infection prevention guidelines is an important initiative for setting up policies to minimize hospital acquired infections. Proper policies will positively influence the period and treatment cost. The ministry of health's department of nursing will benefit

from the policies and aid in infection prevention and improvement of standard operating procedures in prevention of infections at the facility. No research has been done and published on the same at the facility. [6]

II. MATERIAL AND METHODS

A crossectional descriptive study was carried out among nurses in Thika level 5 hospital Kiambu county. A representative sample of 138 nurses was selected. Stratified sampling was employed for selection of units and departments within the facility. Sample size was determine using n=$\frac{z^2pq}{d^2}$ developed by Cochran in 1963 as cited by Israel (1992).

III. RESEARCH DESIGN;

The cross-sectional descriptive study involving quantitative data was conducted in Thika level 5 hospital, the regional referral Hospital for Kiambu County. The facility is located along General Kago road next St Patrick's Catholic parish church Hospital ward Thika Sub-County, Kiambu County.

IV. DATA ANALYSIS

The statistical software for data Science (STATA) was used for data analysis after data collection. The analysis entails data cleaning; comparison of different variables and demographic characteristics analyzed. The significance statistical association between independent and dependent variables was determined using Chi – Square statistics. The relationship between the dependent and independent variables to control confounding bias was by multivariate regression analysis. Multivariate regression analysis was used to control confounding bias and establish the relationship between dependent and independent variables.

V. ETHICAL CONSIDERATION;

The study was carried out after clearance from ethics and research committee of Mt. Kenya University Institutional Scientific Ethic Review Committee (ISERC No……). The National Council of Science technology and innovation (NACOSTI) also granted a permit for data collection. Prior to the study, the principal investigator acquired authority from the training ethics and research regulatory body of the institution (Trec) **then talk about how informed consenting was carried out.**

VI. RESULTS

Influence of knowledge on compliance to IPC guidelines

Participants' knowledge was tested on three items namely: whether they had heard of IPC guidelines, whether they had received any formal training on IPC in the last four years and knowledge on the main route of cross-transmission of infection between patients in a health facility. Majority of the participants (96.9%, n=62) had heard of IPC guidelines while 3.1% (n=2) had not. Majority of the participants (76.6%, n=49) had received formal training on IPC in the last four years while 23.4% (n=15) had not. Concerning knowledge of the main route of cross transmission of infection, majority (56.3%, n=36) gave the correct response, while 43.8% (n=28) gave the wrong response. A knowledge score was computed out of these three items, and converted into a percentage. Participants who scored 100% were considered as having good knowledge while those with below 100% were considered as having poor knowledge. The mean knowledge score was poor (M=77%, SD=24), and the range was 33-100%. Majority of the participants (54.7%, n=35) were found to have poor knowledge on IPC while 45.3% (n=29) had good knowledge.

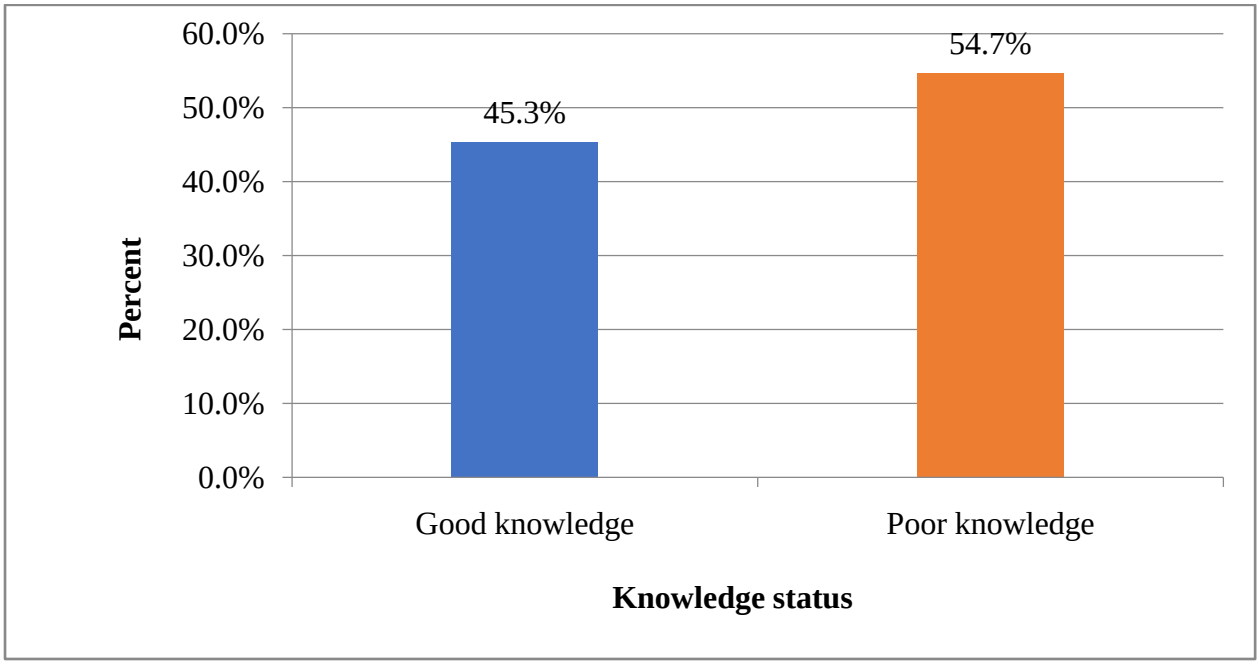

Figure 1: Knowledge on IPC

The findings further revealed that, out of the 29 participants who had good knowledge of IPC, 23 had good compliance while 6 had poor compliance. On the other hand, out of 35 participants who had poor knowledge, 19 had good compliance while 16 had poor compliance. Knowledge and compliance to IPC guidelines were found to be positively correlated, r (62) = .193, p=.127. There was a weak association between knowledge and

The findings further revealed that, out of the 29 participants who had good knowledge of IPC, 23 had good compliance while 6 had poor compliance.. Knowledge and compliance to IPC guidelines were found to be positively correlated, r (62) = .193, p=.127. There was a weak association between knowledge and compliance to IPC guidelines at Cramer's V of 0.262. Moreover, participants with good knowledge were found to be 1.46 times more likely to have good compliance compared to their counterparts (OR=1.461, CI [1.023-2.086]). These findings were statistically significant at $\chi 2$ (1, N=64) = 4.403, p=0.036

Table 1: Influence of knowledge level on compliance to IPC guidelines

Variable	Category	Compliance to IPC guidelines		Total
		Good compliance	Poor compliance	
Knowledge level	Good knowledge	23	6	29
	Poor knowledge	19	16	35
Total		42	22	64

χ^2 (1, N=64) = 4.403, p=0.03

Level of compliance to IPC guidelines

This study focused on six infection prevention and control guidelines namely, what participants used to decontaminate hands, change of gloves between patients, use of PPEs, covering cuts and abrasions with waterproof to avoid contamination, drying hands with disposable hand towel and segregating wastes according to color coded bins and containers.

On the first guideline, i.e. what participants used to decontaminate hands, the study revealed that, majority of the participants (76.6%, n=49) used alcohol based hand rub, 14.1% (n=9) used soap, 1.6% (n=1) used both soap and alcohol based hand rub and 1.6% (n=1) used alcohol based hand rub and methylated spirit. Table 2: Hand decontaminants used by the participants

Table 3: Level of compliance to IPC guidelines

Decontaminant	**Frequency (n)**	**Percent (%)**
Soap	9	14.1
Alcohol based hand rub **(correct practice)**	49	76.6

Methylated spirit	1	1.6
Soap and hand gel	4	6.3
Hand gel and methylated spirit	1	1.6
Total	**64**	**100.0**

The performance in the other infection prevention and control guidelines were as follows: Majority of the participants (93.8%, n=60) changed gloves between the patients, while 6.3% (n=4) did not, 51.6% (n=33) always used PPE while 48.4% (31) did not, 84.4% (n=54) covered cuts and abrasions with a waterproof to avoid contamination while 15.6% (n=10) did not, 82.8% (n=53) always dried their hands with disposable hand paper while 17.2% (n=11) did not. Lastly, majority of the participants (98.4%, n=63) always segregated waste according to color coded paper bags and containers while 1.6% (n=1) did not.

A compliance score was computed out of these 6 guidelines and converted into a percentage. Those who demonstrated correct practice in at least 5 guidelines, i.e. those who scored at least 83%, were regarded as having good compliance, while those with correct practice in at least 4 guidelines, were considered as having poor compliance. The mean compliance score was poor (M=81%, SD=18), and a range of 33-100%. Nevertheless, majority of the participants (65.3%, n=42) had good compliance to IPC guidelines while 34.4% (n=22) had poor compliance. Compliance status i.e. good versus poor, was used as the dependent variable in this study, and all other independent variables were cross-tabulated against it.

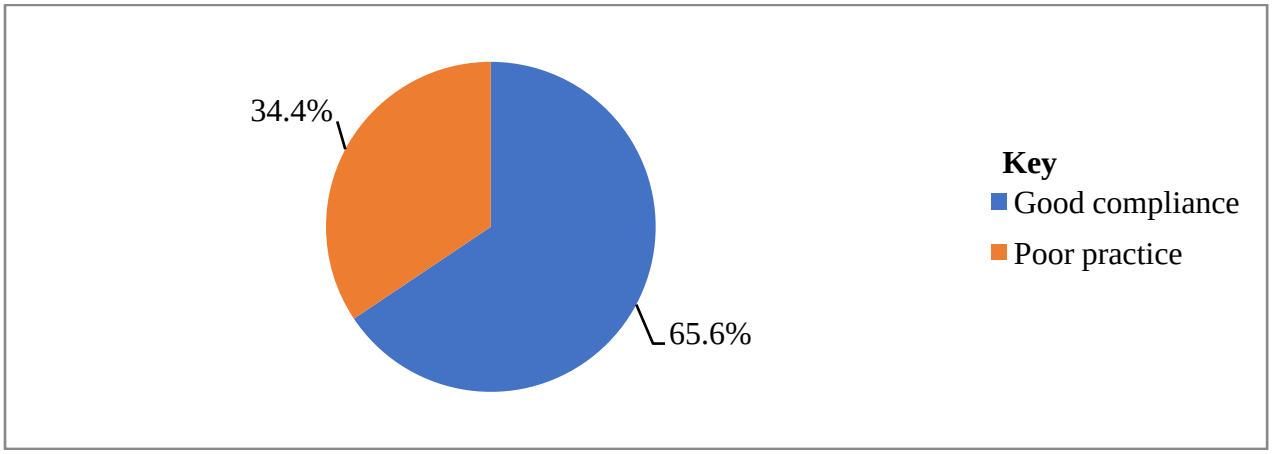

Figure 2: Participants' IPC guidelines compliance

Regression analysis

The study found four factors that significantly influenced compliance to IPC guidelines. These included marital status, department of work, availability of IPC supplies and knowledge on IPC guidelines. These four factors were used to develop a regression model. They were entered in the model stepwise, using an entry point of 0.05 and a removal point of 0.01. Stepwise forward regression was run and this produced a model that was fit for the variables under study

Table 4: Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.647	.263	6.037	1	.014	.524

Table 5: Omnibus tests for model coefficients

		Chi-square	df	Sig.
	Step	23.251	1	.000
Step 1	Block	23.251	1	.000
	Model	23.251	1	.000
	Step	7.959	1	.005
Step 2	Block	31.210	2	.000
	Model	31.210	2	.000

Table 6: Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	59.116[a]	.305	.421
2	51.157[b]	.386	.533

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.
b. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Table 7: Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Department	2.833	.656	18.657	1	.000	17.000
	Constant	-4.779	1.056	20.467	1	.000	.008
Step 2[b]	Marital status	2.757	1.198	5.299	1	.021	15.751
	Department	3.001	.730	16.883	1	.000	20.106
	Constant	-10.080	2.750	13.433	1	.000	.000
a. Variable(s) entered on step 1: Department							
b. Variable(s) entered on step 2: Marital status							

The results, after adjusting for confounding factors indicated that the main determinants of compliance to IPC guidelines were the department of work (Wald =18.657, p=<0.001) and marital status (Wald =5.29, p=0.021).

VII. CONCLUSION;

Marital status and the departments where participants worked were significant influencers of compliance to IPC guidelines. Availability of IPC supplies significantly affected compliance to IPC guidelines. The participants had poor knowledge of IPC guidelines. The participants had poor compliance to IPC guidelines. The null hypothesis, "No relevant statistical association in facility related factors & compliance to IPC guidelines by Thika level 5 hospital nurses" was rejected. The null hypothesis, "No relevant statistical association in knowledge and compliance to IPC guidelines by Thika Level 5 Hospital nurses" Was rejected.

VIII. RECOMENDATION.

The study recommends that, the hospital should avail IPC supplies to all departments at all times, in order to boost the level of compliance to the IPC guidelines. Continuous medical education sessions should be organized on regular basis, to keep the staff up to date with any development, in the field of infection prevention. The researcher suggests that further studies should be conducted in the area of infection prevention, to capture other variables such as attitudes of nurses, and the impact of infection prevention practices on prevalence of specific infectious diseases.

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