International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

Level of Infection Control Measures in Hospitals Case Study: Rubaga and Entebbe Grade B Hospitals

Mohamed Daud Mohamud

Abstract: ***Results of the study indicate that on average, the two hospitals scored the same on gloves use, with a high mean of 3.72. The t-test statistics and p-values revealed that there are no significant differences in the mean scores for the two hospitals. This is because, all the p-values were less than 0.05 and 0.10, meaning that at levels of significance, 90 and 95, the two hospital staffs equally use gloves in their hospital practices. However the researcher observed that some of the departments in the two hospitals were not using hand gloves properly for example in the immunization departments of both Entebbe and Rubaga hospitals. The results show that 69% of the workers indicated that they have bins with lid, while 20.7% use plastic bags. The results further suggest that Rubaga hospital is at a higher level of providing waste collection materials compared to Entebbe. On how the infected wastes are disposed, results indicate that almost 80% of the staff in the two hospitals together said that infected wastes are disposed through incineration. The results indicate that 42% of the staff in the two hospitals had been immunized against TB, Hepatitis B, and Tetanus Toxoid, while 38.5% had been immunized for only Hepatitis B. In Entebbe hospital the biggest number of those who were immunized for one disease was for those who were immunized for only Hepatitis B (37.8%) as well as in Rubaga hospital (38.8%). Rubaga has a slightly higher rate of immunization of the diseases (42.9%) compared to Entebbe hospital (40%). Other diseases that respondents had been immunized against were yellow fever happened to surpass the rest with a 40% rate in the two hospitals, followed by influenza (18.3%) then only polio (11.7%) and then Polio, Measles and BCG, are at 10%. The study recommended hospital staff in developing countries about effective infection control programs. (i)-Training of health workers or health providers in Hospital Acquired Infections. (ii) The Ministry of health managed Entebbe hospital should ensure consistent supply of water electricity so that the institution is able to maintain good infection control activities at all times. . (iii) The hospital management at Entebbe should revisit their strategy on policy management to emphasize availability of policy guidelines. (iv) It is recommended that the holding of infection control committee meetings be made frequent so that chances for knowledge and knowledge sharing are increased HAIs.***

Keywords: Hospital acquired infections, personal protective equipment, hospital management, infection control guidelines

1. Introduction

A Nosocomial infection, also called hospital acquired infection, is an infection acquired in hospital by a patient who was admitted for a reason other than that infection (WHO Report, 2012). It is also an infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility (WHO Report, 2002). Despite progress in public health and hospital care, infections continue to develop in hospitalized patients, and may also affect hospital staff. Infections occurring more than 48 hours after admission are usually considered Nosocomial infections.

Worldwide Infection control programmes (ICP) are concerned with dissemination of information, surveillance activities, investigations, prevention and control of infections.

The programmes should be instituted because the cost of treatment is high, the infections are preventable but only a small percentage of infections is prevented. The control measures adopted by management may not effectively address the challenges of hospital acquired infections because of the weaknesses in surveillance, facilities, resources and reporting. Worldwide people turn to hospitals as last resort for treatment of their ailments. It should be least expected of a hospital to be a source of further infection. Not only may this be acknowledged and ignored, but it may also be overlooked with respect to prevention and control (Azzouzi, 2007).

Infection control professionals are tasked with the responsibility of reducing these HAIs that are directly correlated with invasive procedures. Toolkits are provided to assist infection control professionals in prevention of vascular catheter-associated infections and ventilator-associated pneumonia. Toolkits are also available for surgical site infection prevention. (WHO Report, 2002). According to the report, measures like practicing good hand hygiene, using maximal barrier precautions during catheter insertion, using chlorhexidine skin antisepsis when inserting and during the care of the insertion site. Where it affects the urinary tract, good hand hygiene, good perineal care through adequate washing of the catheter and the site of insertion routinely are recommended.

Edwards (2007) identifies institutional factors to include policies, and structures like implementation committees. Key policies like drug use policy, disinfection, waste management and environmental policies should be designed to promote infection control also Mims (2004) advised that there should be operational policies with respect to HAIs infection control.

According to Perencevich (2007) and Shaiju (2010) observed that procedures, guidelines and practices may not be adequately applied in some hospitals in developing countries specially sub Saharan Africa.

Participating with pharmacy in developing a programme for supervising the use of anti-infective drugs, ensuring patient care practices are appropriate to the level of patient risk and checking the efficacy of the methods of disinfection and sterilization and the efficacy of systems developed to improve hospital cleanliness. Health care workers should

participate in development and provision of teaching programmes for the medical, nursing, and allied health personnel, as well as all other categories of staff as well as provide expert advice, analysis, and leadership in outbreak investigation and control.

According to Uganda Ministry of Health Report (2010), most hospital budgets do not cater for training of infection control staff, recruitment of more infection control professionals, and payment for new and updated educational tools and patient care equipment designed to assist infection prevention.

The overall objectives of the article will be as follows

1) Assess the HAIs control measures at Rubaga and Entebbe General Hospitals.
2) Evaluate institutional factors influencing implementation of the HAIs control measures at Rubaga and Entebbe General Hospitals.
3) Assess the level of knowledge of health workers at Rubaga and Entebbe General Hospitals on infection control measures.
4) Assess availability of infection control measures supplies at Rubaga and Entebbe General Hospitals.

Therefore in this article as an author there is an expectation to clarify the importance of the level of nosocomial infection control measures in hospitals and to identify the most influential factor that influences the Hospital Acquired Infections.

2. Methodology

Methods and Materials

The article used a cross-sectional, descriptive survey research design with both qualitative and quantitative data collection approaches.

This study used a combination of data collection instruments which included:

(i) Questionnaires, (ii) Interview guides and (iii) Observation checklists to obtain primary and secondary data

The researcher compiled and summarized the results in a logical order in relation to the study objectives. The data was described and interpreted in sufficient detail leading to the ultimate conclusions. Tables, graphs and illustrations were used to present the data more clearly and economically. The SPSS package (SPSS 20.0) was employed for data analysis to determine the frequencies and percentages as well as showing the distribution of respondents.

The target population was all health infection control systems in the hospitals.

To calculate the sample size, the calculator needs to be fed with information regarding the confidence level, confidence interval (margin error) and total population.

The confidence level tells you how sure you can be regarding the result of the study and is expressed as a percentage. The 95% confidence level thus means that you can be 95% confident of level of accuracy of your result.

The confidence interval means the margin of error which is always the plus or minus figure usually in the calculator (Creative research System-2009).

Using the above formula the sample size is **140**

To cater for non-response rate researcher adjusted the sample size to **150**respondents

From the two hospitals, a total of 268 medical staff in Rubaga and 132 in Entebbe were chosen here giving a total of 400 medical workers. The management reported that approximately 50% were usually on duty per any given time giving a total of 200 medical workers. Therefore, Rubaga had **100** respondents while Entebbehad **50** respondents.

The sample was stratified by cadre according to doctors, nurses/midwives and allied health professionals.

The number of each cadre studied was proportionately determined based on the staffing levels as indicated to table below:

Table 1: Cadres studied proportionate to staffing levels

Hospital	Cadre	Staffing	Percentage	Sample
Rubaga	Doctors	16	6	6
	Nurses/midwives	175	65	65
	Allied health	77	29	29
	Total	268	100	100
Entebbe	Doctors	10	8	4
	Nurses/midwives	99	74	37
	Allied health	23	18	9
	Total	132	100	50

The study findings are presented to establish the "**Level of infection control measures in Hospitals".** The data was gathered using questionnaires as the research instrument. The questionnaires, interview guides and observation checklists to obtain primary and secondary data.

1) Assessing the Hospital Acquired Infections control measures at Rubaga and Entebbe General Hospitals

Table 2: Hand washing practices in Entebbe and Rubaga hospitals

Hand washing Practices	Hospital	N	Mean	Std. dev.	t-test result	p-value
Frequency of hand washing before handling a patient	Entebbe	50	3.64	0.663	-0.967	0.335
	Rubaga	100	3.74	0.562		
Frequency of hand washing after handling a patient	Entebbe	50	3.88	0.328	0.726	0.469
	Rubaga	100	3.83	0.428		
Frequency of hand washing after contact with body fluids	Entebbe	50	3.92	0.34	-0.385	0.701
	Rubaga	100	3.94	0.278		

Frequency of hand washing after handling waste	Entebbe	50	3.84	0.548	-0.682	0.496
	Rubaga	100	3.89	0.345		
Frequency of hand washing before handling a new procedure	Entebbe	50	3.52	0.614	-1.308	0.193
	Rubaga	100	3.64	0.482		
Frequency of hand washing after removing gloves, masks, uniform, white coats and when leaving the clinic area	Entebbe	50	3.72	0.607	0	1
	Rubaga	100	3.72	0.514		
Frequency of hand washing after dressing wounds	Entebbe	50	3.84	0.618	0.38	0.705
	Rubaga	100	3.8	0.603		
Overall mean	**Entebbe**	**50**	**3.77**	**0.258**	-0.689	0.492
	Rubaga	**100**	**3.79**	**0.23**		
Overall Mean for the two hospitals		**150**	**3.78**	**0.244**		

Key for interpretation of means

Rank	Mean Range	Response	Interpretation
4	3.26 – 4.00	Always	Very high
3	2.51 – 3.25	Sometimes	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very low

The results in **Table 11** indicate that the general level of hand washing practices was reported to be high by the hospital staff (overall mean =3.78 ± 0.244).

The results indicated that on the overall, Rubaga hospital (overall mean=3.79 ± 0.230) performs slightly better than Entebbe hospital (overall mean =3.77 ± 0.258). However, looking at the individual practices, results indicated that the practice of hand washing after contact with body fluids is the most frequently practiced hand washing in the two hospitals, although still Rubaga hospital (mean=3.94 ±0.278) scored slightly higher than Entebbe hospital (mean =3.92 ± 0.340).

The least frequently practiced hand washing practices before handling a new procedure, where Rubaga (mean=3.64 ± 0.482) scored slightly higher than Entebbe (mean=3.52 ± 0.614).

Hand washing before handling a patient is more practiced by Rubaga hospital (mean =3.74 ± 0.562) than Entebbe (mean=3.64 ± 0.663), while hand washing after handling a patient is better done by Entebbe hospital (mean=388 ±0.328) as compared to Rubaga (mean=3.83 ± 0.428). For the remaining hand washing practices, Rubaga hospital performs them better than Entebbe hospital, though the differences were not statistically significant. Table 12 shows practices related to use of gloves.

Table 3: Use of gloves practices in Entebbe and Rubaga hospitals

Use of gloves practices	Hospital	n	Mean	Std. dev.	t-test results	p-value
Frequency of using new pairs of gloves before handling patient	Entebbe	50	3.68	0.551		
	Rubaga	100	3.76	0.474	-0.922	0.358
Frequency of using new pairs of gloves when examine new patient	Entebbe	50	3.7	0.647		
	Rubaga	100	3.77	0.548	-0.694	0.489
Frequency of using new pairs of gloves before handling waste	Entebbe	50	3.74	0.487		
	Rubaga	100	3.73	0.529	0.112	0.911
Frequency of using new pairs of gloves before handling new procedures	Entebbe	50	3.66	0.658		
	Rubaga	100	3.63	0.691	0.255	0.799
Frequency of using new pairs of gloves before dressing wounds	Entebbe	50	3.82	0.523		
	Rubaga	100	3.73	0.649	0.852	0.396
Overall Mean	**Entebbe**	**50**	**3.72**	**0.385**		
	Rubaga	**100**	**3.72**	**0.389**	**-0.06**	**0.953**

Key for interpretation of means

Rank	Mean Range	Response	Interpretation
4	3.26 – 4.00	Always	Very high
3	2.51 – 3.25	Sometimes	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very low

Results in **Table 12** indicate that on average, the two hospitals scored the same on gloves use, with a high mean of 3.72. It is observed that use of gloves was generally high for all items in Table 12. The t-test statistics and p-values revealed that there are no significant differences in the mean scores for the two hospitals. This is because, all the p-values were less than 0.05 and 0.10, meaning that at levels of significance, 90 and 95, the two hospital staffs equally use gloves in their hospital practices.

However the researcher observed that some of the departments in the two hospitals were not using hand gloves

properly for example in the immunization departments of both Entebbe and Rubaga hospitals. . Table 4.11 shows the frequency of final waste collection in the two hospitals.

Table 13: use of Personal Protective equipments in Entebbe and Rubaga hospitals

Personal Protective Equipment	Hospital	N	Mean	Std. deviation	t-test results	p-value
Frequency of using Gloves while handling wastes	Entebbe	50	3.84	0.37	-1.738	0.084
	Rubaga	100	3.93	0.256		
Frequency of using Masks while handling wastes	Entebbe	50	3.02	0.958	-0.874	0.384
	Rubaga	100	3.14	0.697		
Frequency of using Aprons while handling wastes	Entebbe	50	3.2	0.99	-1.771	0.079
	Rubaga	100	3.44	0.656		
Frequency of using Gloves and Masks while handling wastes	Entebbe	49	2.92	0.886	-1.769	0.079
	Rubaga	100	3.17	0.779		
Frequency of using Gloves, Masks and Aprons while handling wastes	Entebbe	50	2.7	0.931	-1.648	0.102
	Rubaga	100	2.98	1.005		
Overall Mean	**Entebbe**	**50**	**3.13**	**0.615**	**-2.235**	**0.027**
	Rubaga	**100**	**3.33**	**0.479**		

Key for interpretation of means

Rank	Mean Range	Response	Interpretation
4	3.26 – 4.00	Always	Very high
3	2.51 – 3.25	Sometimes	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very low

The findings in **Table 14**indicate that the level of use of personal protective equipments was very high for Rubaga (mean=3.33±0.479) and relatively high for Entebbe (mean=3.13±0.615), implying that Rubaga hospital performs significantly better than Entebbe hospital in the use of personal protective equipments. (P-value <0.05). On all indicators in this table, Rubaga scored a higher mean than Entebbe hospital, implying that Rubaga hospital is generally better than Entebbe hospital. Results indicate that the use of gloves while handling wastes is the most frequently applied by the two hospitals, with a mean score of 3.93 for Rubaga and 3.84 for Entebbe hospital. The least was on application of all the three at once, that is gloves, masks and aprons while handling wastes, with a mean of 2.98 for Rubaga and 2.70 for Entebbe hospital respectively.

2) Evaluating institutional factors influencing implementation of the Hospital Acquired Infections control measures at Rubaga and Entebbe General Hospitals

Table 4: Infection control policies and guidelines at Entebbe and Rubaga hospitals (a)

Do you have an infection control policy?	Frequency	Name of Hospital		Total
	Column %	Entebbe	Rubaga	
Yes	Frequency	47	100	147
	Column %	94%	100%	98%
No	Frequency	3	0	3
	Column %	6%	0.00%	2%
Total	**Frequency**	**50**	**100**	**150**
	Column %	**100%**	**100%**	**100%**
If yes, is it operating				
Yes	Frequency	46	100	146
	Column %	97.90%	100%	99.30%
No	Frequency	1	0	1
	Column %	2.10%	0.00%	0.70%
Total	**Frequency**	**47**	**100**	**147**
	Column %	**100%**	**100.00%**	**100%**
Do you have national guidelines on infection prevention and control?				
Yes	Frequency	46	96	142
	Column %	92%	96%	94.70%
No	Frequency	4	4	8
	Column %	8%	4%	5.30%
Total	Frequency	50	100	150
	Column %	100%	100%	100%
If yes, is it operating?				
Yes	Frequency	45	95	140
	Column %	97.80%	99%	98.60%
No	Frequency	1	1	2
	Column %	2.20%	1%	1.40%
Total	**Frequency**	**46**	**96**	**142**
	Column %	**100.00%**	**100%**	**100%**

The results in **Table 15** indicated that all workers in Rubaga hospital are aware that their hospital has an infection control policy, while 94% of the workers in Entebbe hospital are also aware of the same. On the overall, 98% of all workers in the two hospitals showed that their hospitals have an infection control policy. When asked whether it is operating, 99.3% indicated that the infection control policy is working.

Only one respondent from Entebbe hospital showed that the infection control is not working but this corresponds to the one respondent who said that he was not aware of the existence of an infection control policy in the same hospital. When asked whether the infection control policy is working, almost 99% of all workers answered affirmatively, with 100% from Rubaga hospital and 97.8% from Entebbe hospital

When asked whether they have the national guidelines on infection prevention and control, majority (94.7%) answered affirmatively. Of these, 92% were from Entebbe hospital, while 96% were from Rubaga hospital. When asked whether the national guidelines on infection prevention and control are working, almost 99% of all workers answered affirmatively, with 99% from Rubaga hospital and 97.8% from Entebbe hospital. This is implies that the two hospitals have infection control policy and national guidelines for prevention and control of infections, so the infection control of both hospitals is generally high

Workers were also asked whether they have an infection control committee, results in Table 4.14 indicated that 96%

confirmed it, of which 92% were from Entebbe hospital and 98% were from Rubaga hospital. Respondents further indicated that infection control committee meetings mainly take place on a monthly basis, with a frequency of 58.5%. In both Entebbe and Rubaga hospital, such meetings mainly take place monthly and quarterly.

3) Assessing the level of knowledge of health workers at Rubaga and Entebbe General Hospitals on infection control measures

Table 5: Workers' opinion on HAIs Control at Entebbe and Rubaga hospitals

What is your opinion about Hospital Acquired Infection Control?	Frequency	Name of Hospital		Total
	Percentage	Entebbe	Rubaga	
Good hygiene of the hospital	Frequency	4	18	22
	Column %	10.80%	27.30%	21.40%
Operating hand washing procedures	Frequency	3	6	9
	Column %	8.10%	9.10%	8.70%
Immunization of health workers	Frequency	1	5	6
	Column %	2.70%	7.60%	5.80%
Training of health workers about infection control measures	Frequency	5	4	9
	Column %	13.50%	6.10%	8.70%
Operating policies and guidelines for infection control measures in the hospital	Frequency	2	7	9
	Column %	5.40%	10.60%	8.70%
Operating Quality improvement of health care services (5S)	Frequency	5	1	6
	Column %	13.50%	1.50%	5.80%
Proper using of Personal protective equipments	Frequency	3	3	6
	Column %	8.10%	4.50%	5.80%
Adequate supply of disinfectants and water	Frequency	1	4	5
	Column %	2.70%	6.10%	4.90%
Regular Supervision of infection control measures in the hospital based on all departments	Frequency	2	1	3
	Column %	5.40%	1.50%	2.90%
Its measures to protect both patients and health workers from acquiring cross infections	Frequency	8	12	20
	Column %	21.60%	18.20%	19.40%
Total	**Frequency**	**37**	**66**	**103**
	Column %	**100%**	**100%**	**100%**

Results in **Table 18** indicated different opinions of hospital workers on hospital infection controls. As indicated in the Table, 22 (21.4%) of the workers believed in good hospital hygiene as a necessary control for infections. Almost 9% of the workers believed that having operating hand washing procedures in the hospitals is a necessary control for hospital infections.

Other controls workers gave as indicated in Table 4.15 include putting up measures to protect both patients and health workers from acquiring cross infections; operating policies and guidelines for infection control measures in the hospital and so on. Table 19 shows responses regarding respondents' training on hospital infections.

Table 6: Training of hospital workers on hospital acquired infection controls

Have you ever received any training regarding on hospital acquired infection control?	Frequency	Name of Hospital		Total
	Percentage	Entebbe	Rubaga	
Yes	Frequency	37	78	115
	Column %	74%	78%	76.70%
No	Frequency	13	22	35
	Column %	26%	22%	23.30%
Total	**Frequency**	**50**	**100**	**150**
	Column %	**100%**	**100%**	**100%**
If no, how did you learn these procedures?				
Nursing or technical curriculum	Frequency	3	9	12
	Column %	23.10%	40.90%	34.30%
Verbal instructions of supervisors	Frequency	1	6	7
	Column %	7.70%	27.30%	20%
Written guidelines	Frequency	9	7	16
	Column %	69.20%	31.80%	45.70%
Total	**Frequency**	**13**	**22**	**35**
	Column %	**100%**	**100.00%**	**100%**
Do you undergo periodic check up?				
Yes	Frequency	37	76	113
	Column %	74%	76.00%	75.30%
No	Frequency	13	24	37
	Column %	26%	24.00%	24.70%
Total	**Frequency**	**50**	**100**	**150**
	Column %	**100%**	**100%**	**100%**
In case of any accidents like needle-stick injury, spills, etc do you report to				
IN-charge of the department	Frequency	48	100	148
	Column %	96%	100%	98.70%
No reporting is done	Frequency	2	0	2

	Column %	4%	0.00%	1.30%
Total	**Frequency**	**50**	**100**	**150**
	Column %	**100%**	**100%**	**100%**

Results in **Table 19** indicate that majority of the workers in the two hospitals had ever received training regarding on hospital acquired infection control (76.7%), where Rubaga hospital more workers (78%) who had ever attended training regarding on hospital acquired infection control compared to Entebbe (74%).

Results indicate that some workers learnt about the procedures of hospital acquired infection control through written guidelines (45.7%); others learnt of it from verbal instructions of supervisors, while others got it from nursing or technical curriculum.

When asked whether they usually undergo periodic checkup, majority of the workers in the two hospitals (75.3%) indicated that they usually undergo periodic checkups. Rubaga hospital had a slightly bigger number of workers who had received regular checkup (76%) as compared to others. Results also indicate that as a control measure, when an accident occur majority of those affected report to the in-charge (98.7%). All these indicate that the level of knowledge of health workers in the two hospitals is generally high.

4) Assessment of the availability of infection control measures supplies at Rubaga and Entebbe General Hospitals

Table 7: Availability of supplies in Entebbe and Rubaga hospitals

Availability of Supplies	Hospital	N	Mean	Std. Deviation	T	p-value
Availability of Water Supply	Entebbe	50	3.94	0.24	0	1
	Rubaga	100	3.94	0.278		
Availability of Jik	Entebbe	50	3.82	0.438	-0.129	0.897
	Rubaga	100	3.83	0.451		
Availability of Soap	Entebbe	50	3.76	0.591	-3.068	0.003
	Rubaga	100	3.96	0.197		
Availability of Phenol	Entebbe	50	2.54	1.216	-0.194	0.846
	Rubaga	100	2.58	1.174		
Availability of Dettol	Entebbe	50	2.64	1.156	2.916	0.004
	Rubaga	100	2.06	1.144		
Availability of Spirity	Entebbe	50	3.06	1.077	1.721	0.087
	Rubaga	100	2.7	1.267		
Availability of Vim	Entebbe	50	3.2	0.881	-3.282	0.001
	Rubaga	100	3.65	0.744		
Overall Mean	**Entebbe**	**50**	**3.28**	**0.538**	**0.415**	**0.679**
	Rubaga	**100**	**3.25**	**0.444**		

Key for interpretation of means

Rank	Mean Range	Response	Interpretation
4	3.26 – 4.00	Always	Very high
3	2.51 – 3.25	Sometimes	High
2	1.76 – 2.50	Rarely	Low
1	1.00 – 1.75	Never	Very low

The results in **Table 20** indicate that the overall level of availability of supplies was very high for Entebbe hospital (overall mean=3.28 ± 0.538) and high for Rubaga hospital (overall mean=3.25 ± 0.538). Availability was equally highest on water supply for the two hospitals, with a mean of 3.94, followed by availability of soap in Rubaga hospital (mean=3.96) and was lowest on availability of Dettol in Rubaga hospital (mean=2.06±1.144). On the overall analysis, the two hospitals had generally a higher level of availability of supplies for hospital infection controls.

Respondents were also asked to show their views on waste collection materials and marks in their respective hospitals. Their responses are indicated in table 21 in form of frequency counts and percentages for the next page.

Table 8: Waste collection materials and marks

Do you use any marker to indicate sterilized packs?	Frequency	Name of Hospital		Total
	Percentage	Entebbe	Rubaga	
Yes	Frequency	48	96	144
	Column %	96%	96%	96%
No	Frequency	2	4	6
	Column %	4%	4%	4%
Total	**Frequency**	**50**	**100**	**150**
	Column %	**100%**	**100%**	**100%**
Conditions of collection of the waste				
Bins with lids	Frequency	33	71	104
	Column %	66%	71%	69.30%
Bins without lid	Frequency	7	8	15
	Column %	14%	8%	10%
Plastic Bags	Frequency	10	21	31
	Column %	20%	21%	20.70%
Total	**Frequency**	**50**	**100**	**150**
	Column %	**100%**	**100%**	**100%**
If others, specify				
Bins with lid and plastic bags	Frequency	7	32	39
	Column %	63.60%	82.10%	78%
Bins with lid and liners	Frequency	4	7	11
	Column %	36.40%	17.90%	22%
Total	**Frequency**	**11**	**39**	**50**
	Column %	**100%**	**100%**	**100%**
Final disposal of infected waste				
Incineration	Frequency	38	80	118
	Column %	76%	81.60%	79.70%
Burial	Frequency	3	8	11
	Column %	6%	8.20%	7.40%
Taken to municipal collection point	Frequency	9	10	19
	Column %	18%	10.20%	12.80%
Total	**Frequency**	**50**	**98**	**148**
	Column %	**100%**	**100%**	**100%**

Results in **Table 21** indicate that at least 96% of the workers in the two hospitals together affirm that they always use markers to indicate sterilized packs. The results also show that 69% of the workers indicated that they have bins with lid, while 20.7% use plastic bags. The results further suggest that Rubaga hospital is at a higher level of providing waste collection materials compared to Entebbe. On how the infected wastes are disposed, results indicate that almost 80% of the staff in the two hospitals together said that infected wastes are disposed through incineration. On 76%

of the occasions, Entebbe hospital disposes by incineration while Rubaga hospital does so on 81.6% of the occasion. Results indicate that it is only at 7.4% of the occasions that infected wastes are buried while at 12.8% of the occasions, the infected wastes are taken to municipal collection point. Results from respondents agree with what was observed by the researcher on availability and use status of these supplies, as indicated in table 21.

3. Literature Review

Infection control measures in the hospital

A Nosocomial infection, also called hospital acquired infection, is an infection acquired in hospital by a patient who was admitted for a reason other than that infection (WHO Report, 2012). It is also an infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility (WHO Report, 2002). Despite progress in public health and hospital care, infections continue to develop in hospitalized patients, and may also affect hospital staff. Infections occurring more than 48 hours after admission are usually considered Nosocomial infections.

Definitions to identify Nosocomial infections are based on clinical and biological criteria or whether they are endemic or epidemic, the latter being most common. Epidemic infections occur during outbreaks, defined as an unusual increase above the baseline of a specific infection or infecting organism (**WHO/CDS/CSR/EPH/2002.12,).**

Key indicators for prevention of all surgical site infections include giving the patient the most appropriate, effective antibiotic within 1 hour of incision, discontinuing the antibiotic within 24 hours of incision closure, and use of clippers for hair removal or not removing hair at all. In cardiothoracic surgery patients, glucose levels should be monitored during the first 48 hours after surgery and maintained below 200 mg/dL. (Amer, 2000)

Like most African countries, Uganda does not have a policy on injection safety and health care waste management, and yet a lot of waste is being generated from injection use, laboratory and surgical procedures as well as other medical practices. Recent surveys have also established that health care providers and consumers are confronted with significant environmental hazards due to improper and/or delayed disposal and destruction of injection and other health care waste (National Policy on Injection Safety and Health Care Waste Management, 2008).

Institutional factors influencing implementation of infection control measures

Edwards (2007) identifies institutional factors to include policies, and structures like implementation committees. Key policies like drug use policy, disinfection, waste management and environmental policies should be designed to promote infection control also Mims (2004) advised that there should be operational policies with respect to HAIs infection control.

According to Perencevich (2007) and Shaiju (2010) observed that procedures, guidelines and practices may not be adequately applied in some hospitals in developing countries specially sub Saharan Africa.

Singh (2007) and Greco (2011), has indicated that many hospitals do not have defined policies for infection controls much as CDC (2010) recommends that hospitals must have an infection control policy and manuals of the same, which should be updated periodically. It is risk to operate the hospital without clear policy and guidelines (Canage, 2005 Lacor hospital Report (2008) recommends establishment of an Infection Control Hospital Committee, improvement of ward personnel hand washing, minimal use of urinary catheters in number and in time, change in intravascular cannulas and insertion of a new one in another site. There should be careful washing with soap and water and disinfecting the skin before any invasive procedure, not soaking ward metallic instruments in any solution but washing, disinfecting and wiping after any use. Health care workers (HCW) must wear gloves for each contact which may lead to contamination, and gowns, mask and eye protection where contamination of clothes or the face is anticipated. Standard precautions for all patients also include; washing hands promptly after contact with infective material and using no touch technique wherever possible.

The safe handling and disposal of needles and other sharp instruments should form part of an overall strategy of clinical waste disposal to protect staff, patients and visitors from exposure to blood borne pathogens. (WHO Report, 2002).

Level of knowledge of HAIs in hospitals

Whereas infection prevention and control is the responsibility of all health care professionals like doctors, nurses, therapists, pharmacists, engineers and others, their knowledge levels may vary according to different case studies. Alvarado (1999) advocates for infection control committees. A knowledgeable Infection Control Committee provides a forum for multidisciplinary input and cooperation, and information sharing. This committee should include wide representation from relevant programmes: such as management, physicians, other health care workers, clinical microbiology, pharmacy, central supply, maintenance (CSM), housekeeping, training services. (Alvarado *et. al*, 1999) The committee must have a reporting relationship directly to either administration or the medical staff to promote programme visibility and effectiveness. The staff should be provided with knowledge and skills in programme review and appraisal, interventional strategies as well as assessment and promotion of improved practice at all levels of the health facility. They should also get regular training in infection control and monitoring. These should in turn be communicated to stakeholders. Alvarado *et. al*, 1999)

According to Marshall, (2009) health workers should be equipped with knowledge on organizing an epidemiological surveillance programme for Nosocomial infections. Participating with pharmacy in developing a programme for supervising the use of anti-infective drugs, ensuring patient care practices are appropriate to the level of patient risk and

checking the efficacy of the methods of disinfection and sterilization and the efficacy of systems developed to improve hospital cleanliness. Health care workers should participate in development and provision of teaching programmes for the medical, nursing, and allied health personnel, as well as all other categories of staff as well as provide expert advice, analysis, and leadership in outbreak investigation and control. The hospital hygiene service may also provide assistance for smaller institutions, and undertake research in hospital hygiene and infection control at the facility, local, national, or international level. (Marshall *et. al*, (2009)

4. Conclusion

The two hospitals adequately employed the required controls for HAIs such as immunization of staff against diseases like Polio, BCG and measles, hand washing, use of gloves, sterilization and disinfection practices.

The two hospitals adequately follow the protocols regarding hand washing and so they consider hand washing before and after handling a patient, Workers in the two hospitals had adequate knowledge about HAIs control measure, and operating procedures for infection controls and so

There was a high rate of compliance as recommended in the medical sector although waste collection in the two hospitals usually takes place on a daily basis and sometimes twice a day

5. Recommendations

1) Sensitize all hospital staff in developing countries about effective infection control programs
2) Training of health workers or health providers in Hospital Acquired Infections.
3) The Ministry of health managed Entebbe hospital should ensure consistent supply of water electricity so that the institution is able to maintain good infection control activities at all times.
4) The hospital management at Entebbe should revisit their strategy on policy management to emphasize availability of policy guidelines.
5) It is recommended that the holding of infection control committee meetings be made frequent so that chances for knowledge and knowledge sharing are increased HAIs.
6) The management should have enough financial resources for the infection control departments.

6. Acknowledgment

Acknowledgments The Author needs to express his gratitude to Capital University of Somalia, specially, Faculty of Health Science for their equipment support and encouragements.

The Author also thanks the senior lecturer Hassan Mohamed Yusuf Ukumey for his contribution to this article.

References

[1] Abrutyn E, Goldmann D, Scheckler W, eds. *Saunders infection control reference service (*2nd ed). Philadelphia, Saunders, 2001.
[2] Alvarado CJ, Reichelderfer M and the 1997, 1998, 1999 APIC Guidelines Committees. APIC guideline for infection prevention and control in flexible endoscopy. *Amer J Infect Control*, 2000, 26: 138–155.
[3] Greco, D. I. M. (2011). Hospital Acquired Infections in a large North Ugandan hospital. *J Prev Med Hyg 2011; 52: 55-58*
[4] Hospital Coordinator Group. *HAI prevalence in Mekele Hospital, Tigray, Ethiopia*. J Hosp Infect 2005; 56: 142-149.
[5] Ian, M. G. (2010). Current State of Antibiotic Resistance in Hospital Acquired Infection (HAI). International Federation of Infection Control, IPCAN/IFIC Conference abstracts 29 August-1 September
[6] Jroundi I, Khoudri I, Azzouzi A, et al. *Prevalence of HAI in a Moroccan Hospital*. Am J Infect Control.2007; 35: 412-6.
[7] Kallel H, Bahoul M, Ksibi H, et al.2006; 18 (2): 187-94. *Prevalence of HAI in a Tunisian Hospital*. SantePublique
[8] Larson EL.1995, 23: 251–269. APIC guideline for handwashing and hand antisepsis in health care settings. *Amer J Infect Control*,
[9] Lutwama, G. W, Roos, J. H. &Dolamo, B. L. (2012). A descriptive study on health workforce performance after decentralisation of health services in Uganda. *Human Resources for Health* 2012, 10: 41. available at http: //www.human- resources health. com/content/10/1/41.
[10] Mims, C. (2004). Medical microbiology. Edinburgh: Mosby; 2004.551-554
[11] Ministry of Health (2009). Uganda Health Workforce Study: Satisfaction and Intent to Stay among Current Health Workers; A study of facility-based health workers in Uganda conducted in July, 2006 and May, 2007 intended to measure health worker satisfaction, motivation, and intent to stay in the health field to serve the country of Uganda.
[12] Ministry of health report (2008), The government Printer Entebbe, Uganda Opollo, J. G., Gray, J., &. Spies, L. A. (2014). Work-related quality of life of Ugandan healthcare workers. *International Nursing Review*
[13] Pearson ML.1996, 17: 438–473. Guideline for prevention of intravascular device-related infections. Hospital Infection Control Practices Advisory Committee. *Infect Control HospEpidemiol*,
[14] Pratt RJ et al. The epic project: Developing national evidence-based guidelines for preventing Public Accounts Committee Reports (2008-11), Government Printer Entebbe, Uganda
[15] Shaiju, A. (2010). A study on the hospital waste management systems with special reference to liquid waste in selected tertiary care teaching hospitals. Unpublished Masters in Hospital Administration Dissertation. Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka

[16] Shrikant, I. B., Fonn, S., Okoye, O. &Tollman, S. (2010). Workforce Resources for Health in Developing Countries. *Public Health Reviews, Vol.32, No 1, 296-318*