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Outcome of Intervention Programme On Knowledge and Skills of Standard Precautions Among Nurses in General Hospitals in Ogun State, Nigeria

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Abstract

The study evaluated the outcome of intervention programme on knowledge and skills of standard precautions among nurses in general hospitals in Ogun State, Nigeria. The study adopted pre and post-test one group quasi-experimental design. The sample size for this study was 38 nurses. Multi stage sampling procedure was used to select the sample. A structured questionnaire and observation checklist were used as tools for collecting information from the respondents. Both face and content validity of the instrument were determined by experts of Tests and Measurement with background knowledge in Nursing Science. Cronbach Alpha was used to compute the reliability coefficients. On knowledge of standard precautions, reliability co-efficient of 0.76 was obtained while 0.74 was obtained for skills towards implementation of standard precautions. It was revealed that the pre-intervention knowledge and skills of nurses on standard precautions in intervention group were moderate while post intervention knowledge and skills were high. Intervention programme on standard precautions improves knowledge and skills of standard precautions among nurses as there were differences in pre and post intervention mean knowledge and skills score on standard precautions. It was recommended among others that hospitals should regularly organise in-service training for nurses on

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standard precautions. Also, an infection control unit should be established to oversee the standard precautions skills of nurses and to ensure the availability of necessary infection control materials.

Keywords: Outcome, Intervention Programme, Knowledge, Skills, Standard Precautions, Nurses,

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Introduction

Infections come in various ways and forms, may be related to health care activities. Infections increases the number of days patients spend in the hospital, worsens disease condition, and increases the need for more health interventions, leads to more expenses on the part of the patients and in worse conditions, leads to death. These occurrences are no doubt caused by the quality of care received or given by the health personnel. The remote causes of these are the micro-organism isolates antimicrobial resistance, surgical site complications, exogenous flora like bacteria, fungi, protozoa, and viruses from other patients. Other causes include endogenous flora residing on the patient's skin, mucous membrane, gastro intestinal tract, respiratory tract; inanimate environmental surfaces and contaminated objects. Medical equipment devices such as the stethoscope, sphygmomanometer, thermometer, doctors and nurses uniforms, housekeepers cleaning materials (mop, broom, brush, buckets) and bed linens could also cause infections. Other sources of infection could be complicated due to negligence or nonchalant attitude of health care providers (Mireille, Irene, Rosa, Johannes, Suzanne, Christiana & Martine, 2019). The only way to reduce this risk is through the practice of standard precautions.

Standard precautions are aimed towards the reduction to the barest minimum level, the transmission of infections from health care givers to care receivers; from care receivers to their family members; as well as from care givers to fellow care givers (WHO, 2018). Studies on the general principles of infection prevention and control (standard precautions) have shown that to prevent this cross transmission of infections there are some minor practices that could be carried out in healthcare centres. These practices cost little or nothing or close to nothing in achieving them. They include, hand washing, the use of personal protective equipment (PPE) such as gloves, gowns, goggles; proper management of sharps, and disinfection of utensils, proper handling of blood and bodily fluids maintaining clean clinical environment, appropriate use of indwelling devices (urethral and intranasal catheters, nasogastric tube, intravenous access, managing accidents, constant training and educating health care staff – (National Institute for Health and Care Excellence (NICE), (2019). Hand washing is the most important and cardinal part of standard precaution. It is also one of the successful ways of curbing infections among health care practitioners.

Lack of knowledge and skills in standard precautions can expose nurses to potentially contaminated biological agents that may be fatal to health such as hepatitis C and B, HIV/AIDS (Marziale, 2016). "About 100,000 people die each year from infections they have received at hospitals, and between 1 and 3 million people a year die in long term care from healthcare associated infections" says Hicks (Mollenkamp 2016).

Daniele, Valentina, Claudia, Maria and Daniela (2019), studied the knowledge and skills in standard precautions among clinical nurses in Italy. The study revealed that nurses who attended the training scored higher in their skills of standard precaution than those who did not. According to Dilnasheen and Naseem (2018) in a study on knowledge of standard precaution among nurses in public and private tertiary care hospital Labore, there was need for nurses to be involved in regular training on standard precautions. A suggestion was also made on the need to inculcate infection control as a topic in nursing curriculum. This was as a result of their findings which showed poor knowledge of standard precautions among nurses (Dilnasheen & Naseem, 2018).

Nurses are exposed to infectious conditions due to their constant exposure to body fluids, tissue, blood and its products. Measures have been put in place to control the transmissible infections such as Human Immunodeficiency Virus (HIV), Hepatitis B and C

Viruses (HBV and HCV). It has been observed over and over again that health care workers do not or hardly practice standard precautions in the cause of discharging their duties. This may be probably due to lack of knowledge and skills towards infection control or in-availability of necessary materials for the implementation of standard precaution (Jerzy, Anna, Andreze & Jadwiga 2019). Morufu, Omidiji, Abdulraheem, and Ochay (2018) discovered in their study on the level of knowledge and implementation of standard precautions among health workers in health care facilities in Kubwa District, Abuja, Nigeria that there is need for nurses to have the knowledge and skills of standard precautions as a precursor to infection control.

Despite the facts that there have been trainings and retrainings on the use of universal or standard precautions in keeping infections at bay, nurses who work in general hospitals and primary health care workers still find it difficult to implement standard precautions in their practices. From the researcher's observation and experience in the primary health care center during the researcher's clinical posting, the health care workers lack the knowledge of the guidelines of standard precautions as directed by the Centre for Disease Control (CDC). This should be seen as carelessness on their part in the cause of their practice because the standard of conduct, performance and ethics (SCPE) of the Health Care Professions Council (HCPC 2019), has made it clear that it is the duty of health care practitioners to update their knowledge by constantly reviewing healthcare practice guidelines.

The researcher's interaction with colleagues working in the general hospitals revealed poor knowledge and skills of standard precautions among nurses. Though the nurses verbally said they have knowledge of standard precautions, their skills contradict their verbal confession. It is in the light of the gaps - poor knowledge, and poor skills of standard precautions as well as the concern for the quality nursing care that the researcher planned a training on the outcome of intervention program on knowledge and skills of standard precaution among nurses working in the general hospitals in Ogun State.

Based on the introduction, the study assessed the outcome of intervention programme on knowledge and skills of standard precautions among nurses in general hospitals in Ogun State, Nigeria. The study specifically examined:

i. the pre-intervention knowledge of nurses on standard precautions in intervention group;
ii. the pre-intervention skills level of standard precautions among nurses in intervention group;
iii. the post intervention knowledge on standard precautions among the participants in the intervention group;
iv. the post intervention skills level of standard precautions among the participants in the intervention group;
v. the difference in the pre and post intervention mean knowledge score on standard precautions among the intervention group; and
vi. the difference in the pre and post intervention mean skills score on standard precautions among the intervention group.

Research Questions

The following research questions were raised to guide the study:

1. What is the pre-intervention knowledge of nurses on standard precautions in intervention group?
2. What is the pre-intervention skills level of standard precautions among nurses in intervention group?

3. What is the post intervention knowledge on standard precautions among the participants in the intervention group?
4. What is the post intervention skills level of standard precautions among the participants in the intervention group?

Research Hypotheses

The following null hypotheses were generated for this study:

1. There is no significant difference in the pre and post intervention mean knowledge score on standard precautions among the intervention group.
2. There is no significant difference in the pre and post intervention mean skills score on standard precautions among the intervention group.

Methodology

The research adopted a pre-test, post-test, one group quasi-experimental design to assess the outcome of intervention programme on the intervention group. The target population size for the study was all the nurses working in the General Hospitals in Ogun East Senatorial district. They are about 166 nurses on the whole. The sample size for this study was 38 nurses. Multi stage sampling procedure was used to select the sample. A structured questionnaire and observation checklist were used as tools for collecting information from the respondents. Both face and content validity of the instrument were determined by experts of Tests and Measurement with background knowledge in Nursing Science.

The validity was carried out to determine the extent to which the instrument was related to the knowledge and skills on standard precaution among nurses in general hospitals. To ensure the reliability of the instrument, 17 nurses outside the sample area were used as the population to carry out a pilot study. In doing so, 17 copies of questionnaire were administered on the nurses, to determine the reliability of the study. Cronbach Alpha was used to compute the reliability coefficients. On knowledge of the participants on standard precautions – reliability co-efficient of 0.76 was obtained. For skills of the respondents towards implementation of standard precautions – a reliability co-efficient of 0.74 was obtained and the combined average reliability co-efficient of 0.77 was obtained. Therefore, the figure obtained and its combination above showed that the questionnaire was reliable and consistent. All the data collected was coded and analyzed with the use of Statistical Package for Social Sciences (SPSS) Version 21. Descriptive statistics were used to answer the research questions while inferential statistics were used to test the hypotheses at 0.05 level of significance.

Intervention

The intervention group was trained on proper hand hygiene, the appropriate use of the PPEs, and management of sharps. Two modules were treated each day and two days were assigned for the four modules.

Module 1: Hand Hygiene

The participants were taught the proper hand washing techniques: they were guided on steps in hand hygiene with water and soap, using running water or assisted hand washing (pouring water by a partner) where there is no running water. The participants were taught how and when to use alcohol based sanitizers while attending to patients.

Module 2: Personal Protective Equipment (PPE)

This module consists of use of gloves, goggle, gown, and apron. The participants were taught the proper ways of wearing and removing gloves, wearing and removing goggles, wearing and removing gowns or aprons. They were observed for return demonstrations.

Module 3: Sharps management.

Sharp boxes were made available and proper sharps disposal skills to prevent needle prick or sharps injury were demonstrated.

Module 4: Disinfection.

This module emphasised the disinfection of instruments used for wound dressing, stitches removal, and other ward procedures before it is sent to the Central Sterilizing Services Department (CSSD).

Post Intervention

Post intervention questionnaire was administered 4 weeks after intervention.

Results

Descriptive Analysis

Research Question 1: What is the pre-intervention knowledge of nurses on standard precautions in intervention group?

Table 1 Pre intervention Knowledge Level on standard precautions among participants

		Responses			
		Correct		Incorrect	
		Freq.	Percent (%)	Freq.	Percent (%)
1.	Have you heard about standard precautions before?	38	100	-	-
2.	SPs means treating all blood and body fluids as potentially infectious	35	92.1	3	7.9
3.	Good understanding of standard precautions is required for Nurses working in the theatres only	12	31.6	26	68.4
4.	Standard precautions should only be used for patients diagnosed with infectious diseases	24	63.2	14	36.8
5.	Standard Precautions is important in the control of hospital acquired infections	25	65.8	13	34.2
6.	Patients can acquire infections from health workers but not from infectious patients	21	55.3	17	44.7
7.	Hand hygiene should be practiced only when caring for infectious patients	25	65.8	13	34.2
8.	Patients and health workers can acquire infections from hospital surroundings	27	71.1	11	28.9
9.	PPEs should be worn when procedures are likely to generate splashes of blood or body fluids	24	63.2	14	36.8
10.	Needles should not be bent or recapped before disposal	23	60.5	15	39.5
11.	Nurses can use the same pair of gloves for care of more than one patient if the patients are clean	25	65.8	13	34.2
12.	Goggles should be worn to protect mucous membranes of the eye when taking deliveries	24	63.2	14	36.8
13.	Your choice of protective equipment should	25	65.8	13	34.2

	match the task you are going to perform				
14.	If you don't have access to running water, just rub your hands together with an antiseptic hand sanitizer is sufficient.	19	50.0	19	50.0
15	Blood, mucus and all other body fluids are harmless as soon as they leave the body	26	68.4	12	31.6

Table 1 is a summary of the questionnaire showing the frequency and percentage of both correct and incorrect responses of the participants. The table showed that post intervention all 38 (100%) participants had heard of standard precautions, and majority 35 (92.1%) correctly defined standard precautions. These items were correctly answered by majority of participants: Standard precautions is important in the control of hospital acquired infections 25(65.8%); Hand hygiene should be practiced only when caring for infectious patients 25 (65.8%); Needles should not be bent or recapped before disposal 23 (60.5%) and PPEs should be worn when procedures are likely to generate splashes of blood or body fluids 24 (63.2%). While 26 (68.4%) incorrectly answered that good understanding of standard precautions is required for nurses working in the theatre only.

Table 2: Pre-intervention Knowledge score of standard precautions among participants

Level of Knowledge	Range score	Frequency	Percentage (%)
High	11 -15	14	36.8
Moderate	6 – 10	23	60.6
Low	1 – 5	1	2.6

The highest possible score is 15

Table 2 above summarizes the result on pre-knowledge score of the participant. Majority 23 (60.6%) of participants had moderate knowledge of standard precautions. This implies that the pre-intervention knowledge of nurses on standard precautions in intervention group was moderate. Figure i further revealed the pre-knowledge score of the participant at a glance

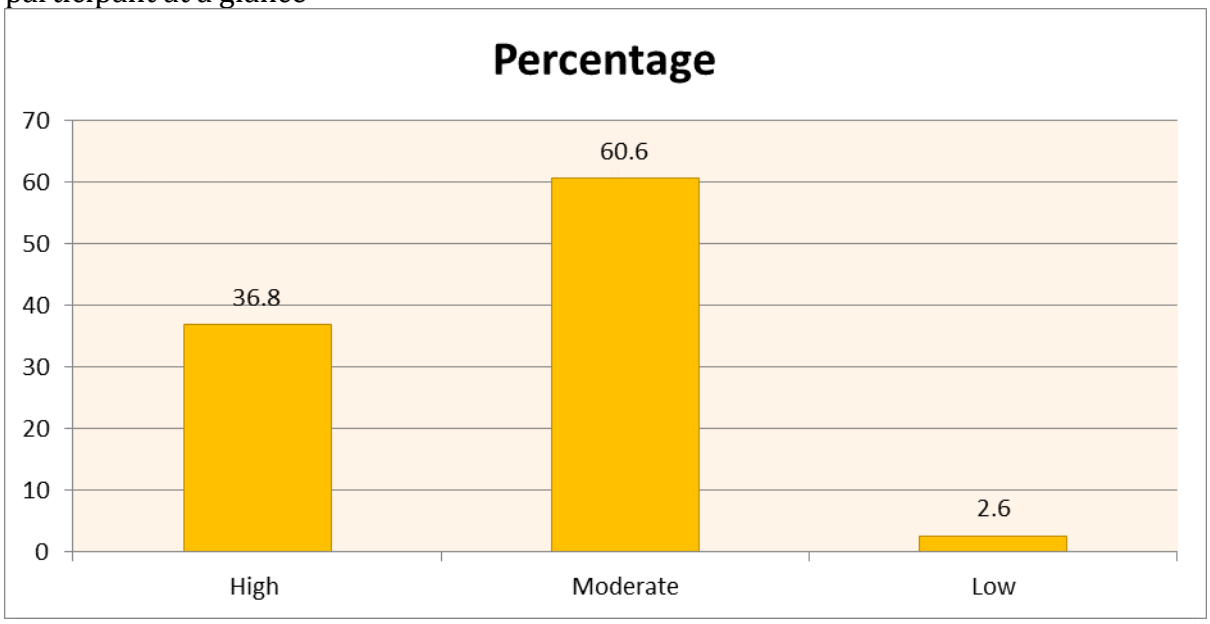

Figure i: Bar Chart showing pre-intervention knowledge score of standard precautions

Research Question 2: What is the pre-intervention skills level of standard precautions among nurses in intervention group?

Table 3: Skills score of the participants

Skills Ranks	Range Score	Frequency	Percentage (%)
High	14 – 20	3	7.9
Moderate	8 – 13	35	92.1
Low	1 – 7	-	-

The highest possible score is 20

Table 3 above summarizes the standard precautions skill scores 35 (92.1%) of participants scoring moderate and 3 (7.9%) scoring high. This implies that the pre-intervention skills level of standard precautions among nurses in intervention group was moderate. Figure ii further revealed the pre-intervention skill score of the participant at a glance

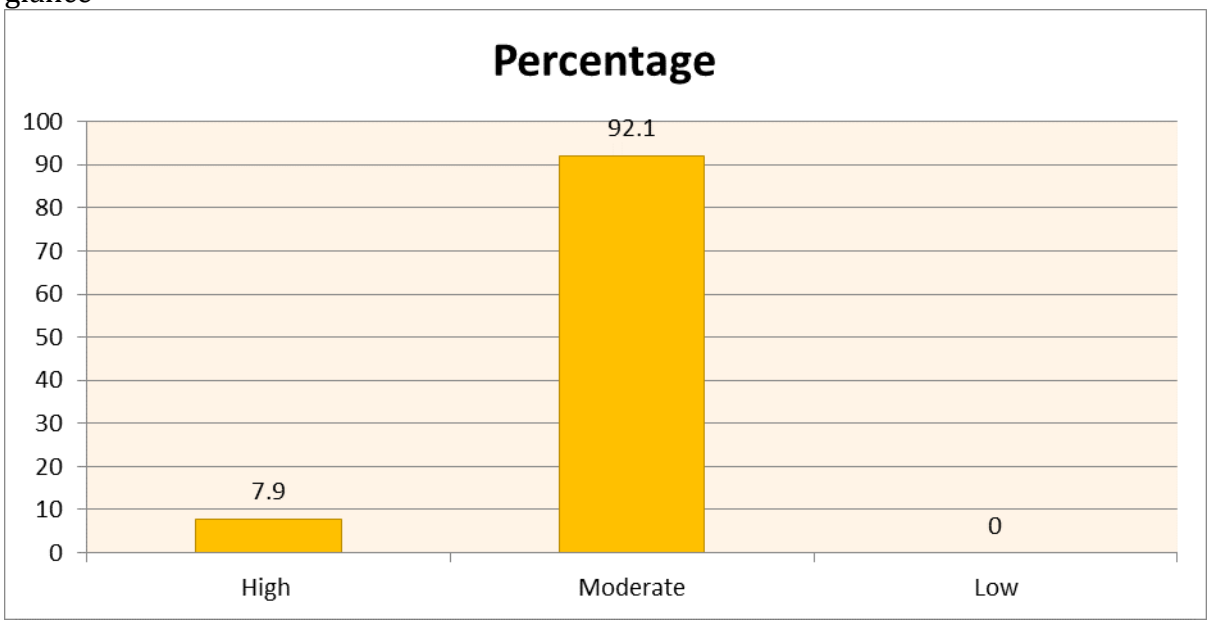

Figure ii: Bar Chart showing pre-intervention skill score of standard precautions

Research Question 3: What is the post intervention knowledge on standard precautions among the participants in the intervention group?

Table 4: Post intervention knowledge level on standard precautions among participants

S/N		Responses			
		Correct		Incorrect	
		Freq.	Percent (%)	Freq.	Percent (%)
1.	Have you heard about standard precautions before?	38	100	-	-
2.	SPs means treating all blood and body fluids as potentially infectious	38	100	-	-
3.	Good understanding of standard precautions is	33	86.8	5	13.2

	required for Nurses working in the theatres only				
4.	Standard precautions should only be used for patients diagnosed with infectious diseases	37	97.4	1	2.6
5.	Standard Precautions is important in the control of hospital acquired infections	38	100	-	-
6.	Patients can acquire infections from health workers but not from infectious patients	33	86.8	5	13.2
7.	Hand hygiene should be practiced only when caring for infectious patients	38	100	-	-
8.	Patients and health workers can acquire infections from hospital surroundings	37	97.4	1	2.6
9.	PPEs should be worn when procedures are likely to generate splashes of blood or body fluids	36	94.7	2	5.3
10.	Needles should not be bent or recapped before disposal	38	100	-	-
11.	Nurses can use the same pair of gloves for care of more than one patient if the patients are clean	35	92.1	3	7.9
12.	Goggles should be worn to protect mucous membranes of the eye when taking deliveries	34	89.5	4	10.5
13.	Your choice of protective equipment should match the task you are going to perform	34	89.5	4	10.5
14.	If you don't have access to running water, just rub your hands together with an antiseptic hand sanitizer is sufficient.	32	84.2	6	15.8
15.	Blood, mucus and all other body fluids are harmless as soon as they leave the body	35	92.1	3	7.9

Table 4 is a summary of the questionnaire showing the frequency and percentage of both correct and incorrect responses of the participants. The table showed that post intervention all 38 (100%) participants had heard of standard precautions, all 38 (100%) correctly defined standard precautions. These items were correctly answered by majority of participants: Standard precautions is important in the control of hospital acquired infections 38(100%); Hand hygiene should be practiced only when caring for infectious patients 38 (100%); Needles should not be bent or recapped before disposal 38 (100%) and PPEs should be worn when procedures are likely to generate splashes of blood or body fluids 36 (94.7%). While 33 (86.8%) correctly answered that good understanding of standard precautions is required for nurses working in the theatre only.

Table 5: Post Intervention knowledge score of the participants

Level of Knowledge	Range score	Frequency	Percentage (%)
High	11 -15	38	100
Moderate	6 – 10	-	-
Low	1 – 5	-	-

Table 5 above showed that all 38 (100%) of participants had post-intervention knowledge score of standard precautions. This implies that the post intervention knowledge on standard precautions among the participants in the intervention group was high. Figure iii further revealed the post-intervention knowledge score of the participant at a glance

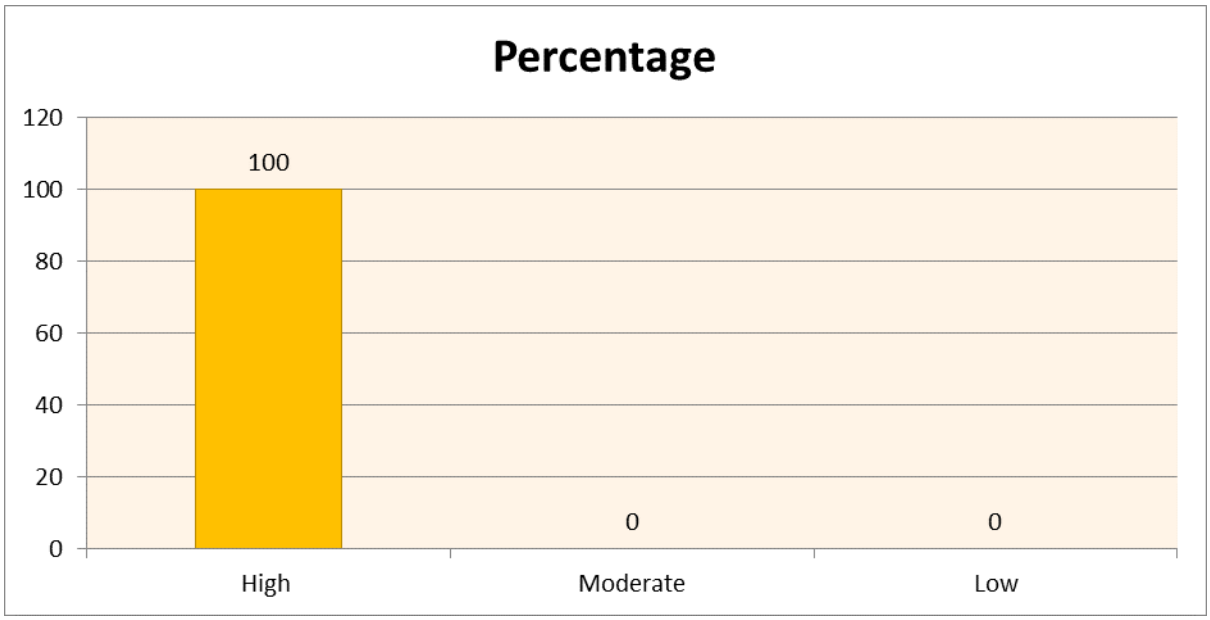

Figure iii: Bar Chart showing post-intervention knowledge score of standard precautions

Research Question 4: What is the post intervention skills level of standard precautions among the participants in the intervention group?

Table 6: Skill score of the participants

Skills Ranks	Range score	Frequency	Percentage (%)
High	14 -20	37	97.4
Moderate	8 – 13	1	2.6
Low	1 – 7	-	-

Table 6 above summarizes the post intervention skills of participants 37 (97.4%) scoring high and 1 (2.6%) scoring moderate. This implies that the post intervention skills level of standard precautions among the participants in the intervention group was high. Figure iv further revealed the post-intervention skill score of the participant at a glance

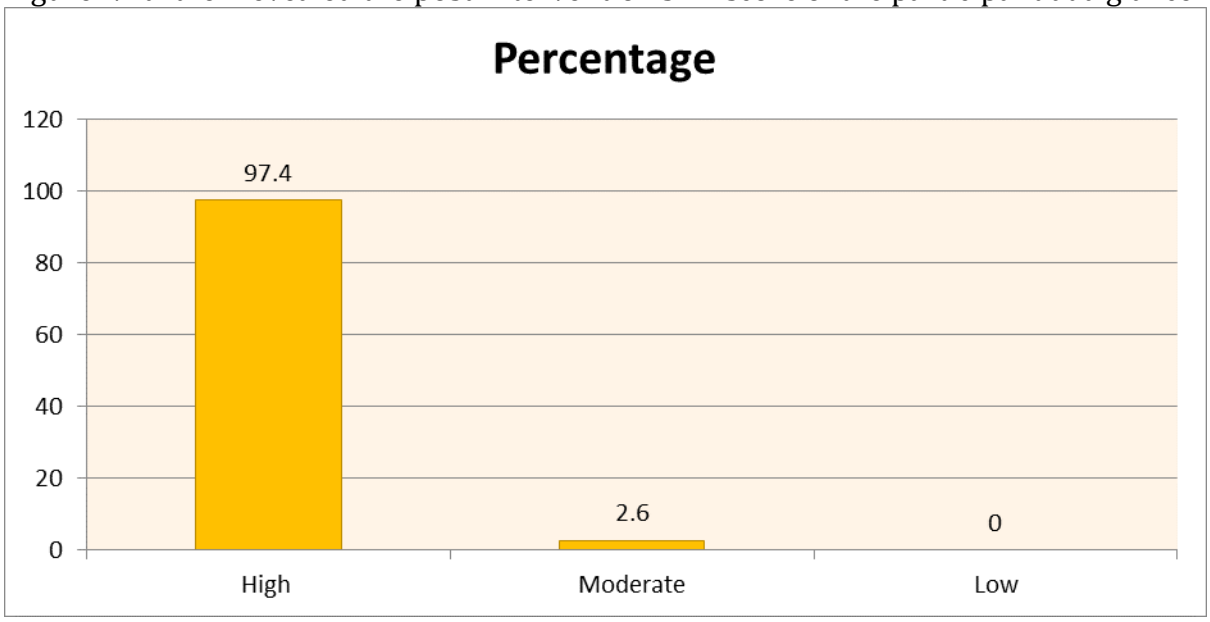

Figure iv: Bar Chart showing post-intervention skill score of standard precautions

Testing of Hypotheses

Ho1: There is no significant difference in the pre and post intervention mean knowledge score on standard precautions among the intervention group.

Table 7: Wilcoxon signed ranks test – Pre-test and post intervention pairs of knowledge

		N	(%)	Z test	Sig.
Post-test knowledge – Pre-test knowledge	Negative Ranks	1[a]	2.6	5.108	0.000
	Positive Ranks	34[b]	89.5		
	Ties	3[c]	7.9		
	Total	38			

a. Post-test knowledge < Pre-test knowledge
b. Post-test knowledge > Pre-test knowledge
c. Post-test knowledge = Pre-test knowledge

The results in table 7 above revealed that 89.5% of the participants had a higher post intervention knowledge scores than pre intervention, and 7.9% of the participants had a consistent knowledge score pre and post intervention programme. The table elicited a statistically significant impact/improvement on the knowledge of standard precautions among the participants (Z = 5.108. p = 0.000). Therefore, the null hypothesis is rejected. Hence, there was significant difference in the pre and post intervention mean knowledge score on standard precautions among the intervention group

Ho2: There is no significant difference in the pre and post intervention mean skills score on standard precautions among the intervention group.

Table 8: Paired Sample Test of pre-test and post intervention pairs overall skills

		Paired Differences					t	df	Sig.
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre-test skill – post-test skill	5.33	2.109	.342	-6.022	-4.635	15.573	37	.000

Details in Table 8 showed that there is a statistically significant increase in the skills of participants ($t_{(37)}$ = -15.573, p = 0.000) of 5.33 units. Hence, the null hypothesis is rejected. Therefore, there was significant difference in the pre and post intervention mean skills score on standard precautions among the intervention group.

Discussion

The findings of the study showed that the pre-intervention knowledge of nurses on standard precautions in intervention group was moderate. This means that the participants may have forgotten some information on standard precautions they had earlier on. This is in support of the study conducted by Dilnasheen and Naseem (2018) on the knowledge of standard precautions among nurses that showed poor knowledge 42.3%, average knowledge 40.3% and good knowledge 17.4%.

The study also revealed that the pre-intervention skills level of standard precautions among nurses in intervention group was moderate. Across all examined skills, the results showed that the participants on average had moderate hand hygiene score of 76.3%; low PPE score of 71%; low sharps management score of 68.4% and moderate disinfections score of 71%. The overall pre intervention results showed that the participants had moderate skills level. This supports the study conducted by Mireille, et al. (2019) who revealed that 20% of nurses demonstrated a satisfactory skill on standard precautions.

The study further revealed that the post intervention knowledge on standard precautions among the participants in the intervention group was high. This is an indication that the training was effective. It supports Farotimi's study on improvement of knowledge post intervention in her study on knowledge of standard precautions (Farotimi, Ajao, Ademuyiwa & Nwozichi 2018). In addition, the study revealed that the post intervention skills level of standard precautions among the participants in the intervention group was high. This result showed an improvement of skills post intervention programme. This is in alliance with the study conducted by Farotimi and others on Knowledge of Standard Precautions that showed an improvement on the post intervention skills of participants (Farotimi, Ajao, Ademuyiwa & Nwozichi 2018).

Findings on hypotheses tested revealed that there was significant difference in the pre and post intervention mean knowledge and skills score on standard precautions among the intervention group. Both findings are in line with the submission of Farotimi et. al (2018) who concluded that nurses performed better on standard precautions after an intervention programme.

Summary of Major Findings

The following are the major findings of the study:

1. The pre-intervention knowledge of nurses on standard precautions in intervention group was moderate.
2. The pre-intervention skills level of standard precautions among nurses in intervention group was moderate
3. The post intervention knowledge on standard precautions among the participants in the intervention group was high
4. The post intervention skills level of standard precautions among the participants in the intervention group was high
5. There was significant difference in the pre and post intervention mean knowledge score on standard precautions among the intervention group
6. There was significant difference in the pre and post intervention mean skills score on standard precautions among the intervention group

Conclusion

It was concluded that the pre-intervention knowledge and skills of nurses on standard precautions in intervention group were moderate while post intervention knowledge and skills were high.

Intervention programme on standard precautions improves knowledge and skills of standard precautions among nurses as there were differences in pre and post intervention mean knowledge and skills score on standard precautions.

Recommendations

Based on findings of the study, the following recommendations are made:

1. Hospitals should regularly organise in-service training for nurses on standard precautions
2. An infection control unit should be established to oversee the standard precautions skills of nurses and to ensure the availability of necessary infection control materials.
3. There should be running taps in strategic areas of the hospital to encourage prompt and regular hand hygiene. Personal protective equipment should be made available by hospitals management and nurses should be encouraged to make judicious use of them.

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