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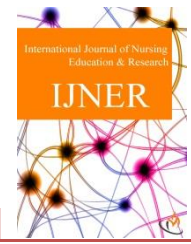
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EFFECT OF SIMULATION ON NURSE'S COMPETENCIES REGARDING INFECTION CONTROL PRACTICES

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ABSTRACT

Introduction: Major concern for health care workers is the danger attached to the spread of microorganisms that is infection from person to person and from place to place. Health –care associated Infections (HCAI) are the infections that constitute a health hazard which are life threatening. Breaking the chain of infection is the prime step in infection control. Of all the Infection control practices (ICP), hand hygiene (HH) is the effective way to prevent spread of infections.It is important that nurses strictly adhere to the HH practices to control infection in the hospital setting. Aim: To assess the effect of simulation based Instruction(SBI) on competencies of nurses regarding Infection control practices(ICP).Materials and methods: A quasi-experimental, time –series, nonequivalent control group design was adopted for the study. Sample size of 30 samples, 15 in experimental group and 15 in control group were selected for the study. The samples were selected by simple random sampling and purposive sampling method. The nurse's competencies namely cognitive, affective and psychomotor were assessed using tools duly tested and proved to be valid and reliable. A structured questionnaire to assess the cognitive competency, likert scale to assess the affective competency and observation checklist to assess the psychomotor competency were used. Pretest was assessed followed by administration of the intervention, SBI where simulation technique was used and then posttest was assessed. Results: The results showed that in there was no significant difference in nurse's competency scores between control and experimental group in pretest. But, there was a significant difference between control and experimental group in nurse's competency scores in posttest 1and post test 2. This is attributed to the effectiveness of the intervention, SBI on nurse's competencies in relation to ICP. Conclusion: Simulation is an effective method in enhancing the nurse's competencies with regard to nurse's clinical practice.

INTRODUCTION

Background of the study:

Infection is a threat to patient safety. Major concern for health care workers in the hospital is the danger attached to spread of microorganisms, i.e. infection from person to person and from place to place.

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Health care –associated infections (HCAIs) are infections that happen due to the treatment or delivery of health services in the hospital setting. HCAIs are infections that develop in a patient after hospitalization, which was neither present, nor in its initial stage at the time of admission to the hospital. HCAI accounts for nearly 5% of all hospitalized patients, in 2018-19 more in ICUs on a given day. 1 in 31 hospitalized patients acquire at least one HCAI. [1] Infectious organisms can spread from one person to another through nurse's hands and through needle stick injuries on

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the fingers of nurses. Such infections are increasing in recent days with poor compliance with ICP among nurses.

Need for the study:
Prevention is always better than cure. Infection prevention strategies must be effectively focused to break the agent-host-environment interactions. [2] CDC and WHO strongly recommend the Standard Precautions (SP). The main components of SP are the Hand hygiene (HH). The WHO- World HH day, 5th May 2021 campaign reveals that 70% health care workers (HCW) and 50% surgical team members do not routinely wash their hands due to the HCW s misinterpretations on the importance of HH in everyday practice. The WHO asks HCW and HCF to achieve effective HH at the point of care by the slogan, "Seconds saves lives –clean your hands"[3] Anchal et.al (2021) carried out a study to assess the compliance of hand washing by nurses in PIMS, Pondicherry, India.113 nurses participated in the descriptive study, out of which 8.8% had poor HH practice, 69.9% had average HH practice and good HH practice by 21.2%. This study clearly shows the need to reinforce HH practice among nurses and the need to constantly update bedside nurses about HH protocols currently in the health care practice.[4]

Simulation is the method for on the job training of nurses. To ensure competency among nurses, simulation method is the best strategy that will ensure hands- on skills of nurses. Simulation plays a crucial role to avoid breaks in ICP. Certain times, there may be gaps in practice. Simulation will enhance the skills of nurses, to fill the gaps in practice. Skilled and competent nurses are required today for quality care and better patient outcome.

Aim:
To assess the effect of simulation based Instruction(SBI) on nurse's competencies in relation to Infection control practices(ICP) in selected setting.

Materials and Methods:
Research Approach
A Quantitative research approach was adopted for the study.

Research Design
A Quasi-experimental, Time- series, Nonequivalent control group design was adopted for the study.

Variables:
Independent variable: SBI of ICP
Dependent variable: Nurse's ccompetencies on ICP

Study setting:
The research was conducted in four hospitals of Coimbatore district with bed strength of the hospital ranging between 60 beds to 150 beds. The hospitals were multispecialty hospitals which cater to the population within Coimbatore city.

Samples:
Samples are nurses who are registered staff nurses.

Sample size:
A total of 30 nurses were selected. 15 in control group and 15 in experimental group.

Tool validity and reliability:
Content validity and reliability was established.

Data collection:
The researcher collected the needed data from the study participants' prior and following intervention using structured instruments. The instruments used were the structured selfadministered questionnaire, attitude self reported Likert scale, observational rating scale. The instruments were pilot tested to check the quality of data and study variables.

Ethical clearance:
The ethical clearance was obtained from the concerned authorities for collecting the data. Data was collected after obtaining informed consent from the participants.

Data analysis was carried out using descriptive and inferential statistics

Results:
Assessment of demographic variables of participants in control and experimental group
The study group consisted of 30 nurse participants (n=30).With regard to age, in the control group, (86.7%) were in the age group of 21- 30 years, with regard to gender, all (100%) were females and in the experimental group, with regard to age, majority of nurses (80%) were in the age group of 21-30 years, with regard to gender, (93.3%) were females. With regard to the participant's qualification, in the control group, all (100%) have undergone GNM or diploma program. With regard to years of experience of nurses, (46.7%) were having 2-5 yrs of experience, In the experimental group, with regard to the participant's qualification, (73.3%) have undergone B. Sc (N) program and with regard to years of experience of nurses,(66.67%)) were having 2-5 yrs of experience.

Assessment of cognitive competencies of nurses on ICP in Control and Experimental group
There was no significant difference in cognitive competency scores between control and experimental group in pretest(22.87 $\pm$ 3.739, 22.47 $\pm$ 3.739). But, there is a significant difference between control and experimental group in posttest 1and post test 2(23.00 $\pm$3.117, 41.53 $\pm$

3.335) and post test 2 (16.80 $\pm$ 2.455, 43.33 $\pm$ 1.988), p < 0.000 .This is attributed to the effectiveness of SBI on the competencies of nurses regarding ICP in the control and experimental group.

Assessment of affective competencies of nurses on ICP in Control and Experimental group

There was no significant difference in affective competency scores between control and experimental group in pretest.But there is a significant difference between control and experimental group in posttest 1 and post test 2 .This is attributed to the effectiveness of SBI on competencies of nurses regarding ICP in the control and experimental group.

Assessment of psychomotor competencies of nurses on ICP in Control and Experimental group

There was no significant difference in psychomotor domain scores between control and experimental group in pretest. But there is a significant difference between control and experimental group in posttest 1 and posttest 2 This is attributed to the effectiveness of SBI on the competencies of nurses regarding ICP in the control and experimental group.

Table 1:- Distribution of participants according to their demographic variables in control and experimental group

Demographic variables	Category	Control group (n= 15)		Experimental group (n= 15)		Chi- square value and df	p value
		f	%	f	%		
Age	21-30	13	86.7	12	80.0		
	31-40	2	13.3	2	13.3		
	41-50	0	0.0	1	6.7	0.096	0.756
	51-60	0	0.0	0	0.0		
	61-70	0	0.0	0	0.0	df 1	
Gender	MaleFemale	0	0.0	1	6.7	0.007	0.386
		15	100.0	14	93.3	df 2	
Qualification	GNM	15	100.0	4	26.7	0.008	0.930
	B. Sc (N)	0	0.0	11	73.3	df 1	
Years of experience	1 yr and less	7	46.7	0	0.0	1.905	0.386
	2-5 yrs	7	46.7	10	66.67		
	6-10 yrs	1	6.7	3	20.0	df 2	
	Above 11 yrs	0	0.0	2	13.33		

Table 2: Assessment of cognitive competencies of nurses on ICP (Independent t value)

Assessment	Control group (n= 15)		Experimental group (n= 15)		Independent t value	p value
	Mean	SD	Mean	SD		
Pre test	22.87	3.739	22.47	3.739	0.293	0.772
Post test 1	23.00	3.117	41.53	3.335	-15.724	0.000
Post test 2	16.80	2.455	43.33	1.988	-32.528	0.000

Table 3: Assessment of affective competencies of nurses on ICP (Independent t value)

Assessment	Control group (n= 15)		Experimental group (n= 15)		Independent t value	p value
	Mean	SD	Mean	SD		
Pre test	83.80	7.292	83.80	8.930	0.000	1.000
Posttest 1	86.67	7.198	98.80	5.870	-5.059	0.000
Posttest 2	79.80	4.873	98.87	3.962	-11.759	0.000

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Table 4: Assessment of psychomotor competencies of nurses on ICP (Independent t value)

Assessment	Control group (n= 15)		Experimental group (n= 15)		Independent t value	p value
	Mean	**SD**	**Mean**	**SD**		
Pre test	50.27	11.158	39.33	4.670	3.501	0.002
Posttest 1	50.00	9.517	78.67	10.210	-7.955	0.000
Posttest 2	44.93	3.936	89.73	4.267	-29.887	0.000

Discussion:

Assessment on effect of SBI on nurse's competencies reveals that there is significant difference in the mean scores between pretest, posttest 1 and posttest2 in total score as well as in all nurses' competencies between the control and experimental group. The mean competency scores are significantly increased in posttests compared to the pretest. This is attributed to the effectiveness of the intervention, the Simulation Based Instruction (SBI) on competencies of nurses on ICP. This is in par with the study conducted by Jayasudha (2019). The study was to assess the effectiveness of simulation based training (SBT) program on obstetric and newborn care among nurses in tertiary care setting in Coimbatore, India. 40 nurses were studied. The results showed pretest knowledge score 18.37 whereas post test knowledge score 28.9 with a t value of 19.21. This is significant at p value 0.05 and to suggest that the simulation based training (SBT) program was effective in improving the knowledge of nurse midwives regarding obstetric and newborn care.

Conclusion:

The study findings depict SBI to be effective in improving nurse's competencies on ICP. The study results shows the changes seen in the experimental group in terms of the dependent variable. Thus it reveals that simulation as an important tool or strategy to enhance nurse's competencies in various clinical nursing practice.

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