Original Research Paper

Volume - 11 | Issue - 09 | September - 2021 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Anaesthesiology

"KNOWLEDGE AND PRACTICE OF STANDARD OPERATINGPROCEDURE ON INFECTION PREVENTION ANDCONTROLOF COVID-19 AMONG ICU NURSES OF KAMRUP (M) ASSAM; A DESCRIPTIVE STUDY"

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ABSTRACT According to WHO the outbreak of coronavirus disease (COVID- 19) that was first reported from Wuhan , China, on 31st Dec 2019. As we are aware , Covid- 19 is widely spreading across the country rising beyond 4000 positive cases in a day of the first wave. In India according to R. Gangakhedar , the head of the epidemiology division at ICMR, said at the press conference on April 20th , 2020 of 80 out of 100 confirmed COVID-19 cases were asymptomatic. It is the responsibility of the staff to ensure that they constantly maintain a high standard of infection control practice. SOP in infection control means the standard infection control precautions must be used by all nurses , in all care settings, at all time, for all patients whether infection is known to be present or not but to ensure the safety of those of being cared for , as well as the staffs and the visitors.

OBJECTIVE-

1. To assess the knowledge of SOP on infection prevention and control of COVID- 19 among nurses .
2. To evaluate the practice of SOP on infection prevention and control of COVID-19 among nurses.
3. To find the correlation between the knowledge and practice of SOP on infection prevention and control among nurses .
4. To find out the association between the knowledge and practice with selected demographic variables (age, qualification, gender, education, experience, type of ICU, training attended) among nurses.

METHODS AND MATERIALS- the research approach adopted for the study was quantitative approach. A descriptive research design was used in this study to accomplish the objectives using non-probability purposive sampling technique for obtaining adequate sample for the study. Study was undertaken on 60 ICU nurses in selected hospitals of Kamrup (M) Assam. Participants were selected on the basis of those who fulfilled the inclusion criteria. The tool used for the study was structured knowledge questionnaire was used to assess the knowledge, and observation checklist was used to evaluate the practice of SOP on infection prevention and control of COVID-19 **RESULTS-** Data analysis was done by calculating mean, standard deviation and chi square. In knowledge, the study revealed that out of 60 respondents , majority 38 (63 %) had moderately adequate knowledge, 14(23%) had inadequate knowledge and 8(14%) had adequate knowledge of Standard Operating Procedure on infection prevention and control of COVID-19. In practice , the study revealed that out of 60 respondents , majority 51(85%) had moderately adequate practice and 9 (15%) had adequate practice of Standard Operating Procedure on infection prevention and control of COVID-19.The co-relationship between knowledge and practice were 0.331 which was moderately positive correlation. There was significant association of knowledge with total years of working experience among nurses working in CTVS, ICCU and post-COVID- 19 ICU and none of the demographic variables had shown statistically significant association with level of practice of Standard Operating Procedure on infection prevention and control of COVID-19 among nurses .**CONCLUSION**- After analyzing the collected data .This study gives the area to improve in knowledge of the nurses and practice of ICU nurses regarding SOP on infection prevention and control of COVID-19. Therefore, continual education to the nurses does go long way in increasing their knowledge and practice to prevent infection which can help in controlling the rate of Hospital acquired infections .

KEYWORDS : knowledge , practice , SOP, infection prevention and control , COVID 19, ICU, nurses.

INTRODUCTION-

Hospital acquired infection influence the quality of health care and are a major source of adverse outcomes during health care delivery HAI greatly increase morbidity and mortality of patients and healthcare costs .The burden of HAI in developing countries is significant, whereby the incidence can be up to 15% of total hospitalized patients, and up to 50% among ICU patients.HAI are challenging to treat because the etiological agents frequently develop multidrug, extensively drug and drug resistance . HAI have a big economic impact on healthcare by extending ICU stay, hospital stay, and increasing the need for invasive procedures. The most common HAI are primary bloodstream infections (BSI), ventilator-associated pneumonia (VAP), urinary tract infections (UTI) and surgical site infections (SSI), with SSI being the most prevalent in some studies . The incidence of HAI in ICUs is about 2 to 5 times higher than those in general inpatient departments due to many associated risk factors Furthermore, antimicrobial resistance rates in ICU are much greater than in general departments one study from Kuwait reported that their VAP rate was 4.0 per 1000 mechanical ventilator days, the central line–associated BSI rate was 3.5 per 1000 central line days, and the catheter associated urinary tract infection (CAUTI) rate was 3.3 per 1000 urinary catheter days. Another study from Ecuador showed that device associated HAIs rates in their ICUs were higher than the United States CDC/ NSHN rates and similar to International Nosocomial. [1] SOPs of hospital-associated infection prevention manual containing instructions and practices for patient care is an important tool. The manual should be developed and updated by the infection control team and reviewed and approved by the committee. It must be made readily available for health care workers, and updated in a timely fashion. For clients to enjoy quality services, a management system is needed which acknowledges their needs, established standards and attempts to keep up these standards with a view to client satisfaction. Quality management can be useful to nursing and contribute to the implementation of new methods and changes necessary for the improvement of care and both team and patient satisfaction. The best way of standardization is to understand how the whole process occurs and, in this case, a systematic representation is required.

OBJECTIVE:

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REVIEW OF LITERATURE

SECTION-I - Literature related to Risk factors of healthworkers with corona virus disease

Ran L et al. (2020) conducted a retrospective cohort study in a designated hospital of 3300- bed grade in Wuhan China . Samples

were all the clinicians and nurses . 72 participants who falls on the high risk exposure including the frontlines in the ICU , 33 are in the high risk department and 39 were in general department . Results showed that 28 health care workers diagnosed with Covid-19 and the common symptoms were fever, cough, bradycardia , chest distress , headache, diarrhea, and hemoptysis and this study indicated that the HRD group had 2.13 times higher in developing Covid -19 compared with the GD group.Literature related to Covid 19.[2]

SECTION-II - literature related to COVID-19 knowledge and practice level

Aydin S et al . (2020) **conducted a descriptive study on** nurses knowledge and attitudes towards infectious diseases in Afyonkarahisar Health Sciences University Medical Faculty Hospital during the COVID-19 outbreak. 123 nurses were included by cluster sampling system. Participants responded to a questionnaire study questioning the basic information of 34 items. Results showed that during the COVID-19 outbreak, 97.6% of the nurses studied had extensive information on the clinical symptoms of COVID-19 infection and 88% on diagnostic methods. In addition, approximately 66.7% of the participants had a story of contact with the patient with proven COVID-19 positivity. 91.1% thought it was likely to get this infection. As a result; This study shows that during the COVID-19 outbreak, more attention should be paid to the knowledge and attitudes of nurses working in pandemic hospitals, and measures should be taken to reduce stress.Literature related to psychosocial aspect.[3]

SECTION-III - SOP – use in nursing care in hospital services

Guerrero GP et al .(2009) conducted a descriptive and quantitative study , carried out in three hospitals in Brazil on sop – use in nursing care in hospital services a total of 261 nurses participated which were randomly selected . Results indicate 56.7% use SOP only when they have doubts , 54.02% of the nursing technician and auxiliaries and 62.86% do not believe the procedure are being compiled with.These findings indicate the need for continuing training on SOP use and compliance by all professionals , with a view to improve nursing care.[4].

SECTION-IV - KNOWLEDGE AND PRACTICES OF INFECTION CONTROL

Iliyasu G et al.(2016) conducted a cross-sectional study on knowledge and practice of infection control among HCWs in a tertiary referral centre in North Western Nigeria . A self-administered structured questionnaire was distributed to the study group (of doctors and nurses) . Results showed 152 were nurses and 48 were doctors were the samples. Most of the respondents 174/198 (87.9%) correctly identified hand washing as the most effective method to prevent HCAI, with nurses having better knowledge 139/152 (91%) Majority agreed that avoiding injury with sharps 172/200 (86%), use of barrier precaution 180/200 (90%) and hand hygiene 184/200 (92%) effectively prevent HCAI. Only 88/198 (44.4%), 122/198 (61.6%), and 84/198 (42.4%) of the respondents were aware of the risks of infection following exposure to human immunodeficiency virus, hepatitis B virus and hepatitis C virus-infected blood, respectively. About 52% of doctors and 76% of nurses always practice hand hygiene in between patient care.[5]

RESEARCH METHODOLOGY

RESEARCH APPROACH: Quantitative research approach
RESEARCH DESIGN: Descriptive research design
RESEARCH VARIABLES: Knowledge and practice
DEMOGRAPHIC VARIABLES: Age,gender, educational qualification, total years of working experience, working area and any training attended regarding COVID-19

SETTING: The setting were GNRC Hospital Dispur and Health City Hospital, Guwahati, Assam.

POPULATION-In this study, the population selected for the study were the nurses

TARGET POPULATION: In this study, the target population were the ICU nurses working in CTVS, ICCU and post COVID-19 ICU of Kamrup(M) Assam.

ACCESSIBLE POPULATION- In this study, it refers to the nurses working in CTVS, ICCU and post COVID-19 ICU of Health City and GNRC Hospital Guwahati, Assam

SAMPLE- In this study, the samples were the ICU nurses working in CTVS , ICCU and post – COVID-19 ICU of selected hospitals Kamrup(M), Assam who fulfilled the inclusion criteria.

SAMPLE SIZE- 60

SAMPLING TECHNIQUE:Non-probability purposive sampling technique.

SAMPLE CRITERIA

INCLUSION CRITERIA- Nurses working in CTVS, ICCU and Post-COVID-19 ICU who were:

- Present on the day of data collection.

EXCLUSION CRITERIA : The exclusion criteria in the study were:

- Not willing to participate

TOOLS : Tools used in this study were:-

1. Demorgraphic data
2. Structured Knowledge questionnaire to assess knowledge
3. Observation checklist to assess practice

TECHNIQUES

1. Self-report
2. Observation

CONTENT VALIDITY

The prepared tool was validated by: The tools were validated by experts comprising of 4 nursing experts in medical surgical nursing department, one nursing expert in paediatrics,one medical experts in the field of pulmonology and one medical expert in infection control , one medical expert in pathology and one medical expert in anaesthesiology. The experts were asked to provide their valuable suggestion in the remarks column of the content validity format. The items of the tools were evaluated for relevancy, accuracy and appropriateness. Based on their suggestion the following modifications were done on various sections of the tool.

RELIABILITY OF TOOL: The reliability of the tool was done by split half method for knowledge and was found to be 0.75and the reliability of practice was done by inter rater method for observation checklist and the reliability was found 0.80.

PILOT STUDY : the study was conducted from 30th Nov to 5th Dec, 2020 conducted in GNRC Hospital North Guwahati Assam.10 samples were selected using non-probability purposive sampling technique and the study was found to be feasible.

MAIN STUDY- The main study was conducted for urban community in GNRC and Health City Hospitals respectively of Kamrup(M).The data collection began from 14.12.2020 to 14.1.2021

RESULTS

Table 1: Frequency and percentage distribution of demographic variables of ICU Nurses.

N = 60

Demographic Variables	Frequency (f)	Percentage (%)
Age in years		
21 – 30	40	66.7
31 – 40	20	33.3
>40	-	-
Gender		
Male	2	3.3
Female	58	96.7
Professional qualification		
GNM	31	51.7
B.Sc. Nursing	16	26.6
Post Basic B.Sc. Nursing	13	21.7
Total years of work experience		
<1 year	7	11.7
1 – 5 years	31	51.7
6 – 10 years	20	33.3
>10 years	2	3.3
Type of ICU you are working		
ICCU	24	40.0
CTVS	14	23.3
PostCovid -19	22	36.7
Any training attended regarding SOP – infection prevention and control of Covid-19		

Yes		
1 session	14	23.3
2 session	9	15.0
>session	14	23.3
No	23	38.4
Does your hospital have infection prevention and control committee?		
Yes	60	100.0
No	-	-
Does your hospital have infection prevention and control guideline/ protocol?		
Yes	60	100.0
No	-	-
Does your hospital have infection prevention and control nurse?		
Yes	60	100.0
No	-	-

Table 2: Frequency and percentage distribution of level of knowledge of Standard Operating Procedure on infection prevention and control of COVID-19 among ICU Nurses.

n = 60

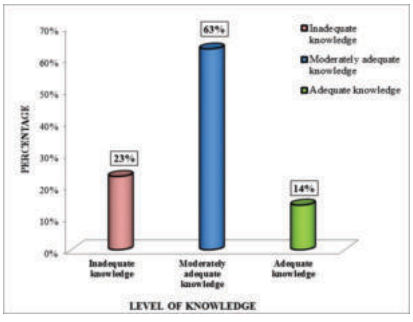

Table 3: Frequency and percentage distribution of level of practice of Standard Operating Procedure on infection prevention and control of COVID-19 among ICU Nurses.

n = 60

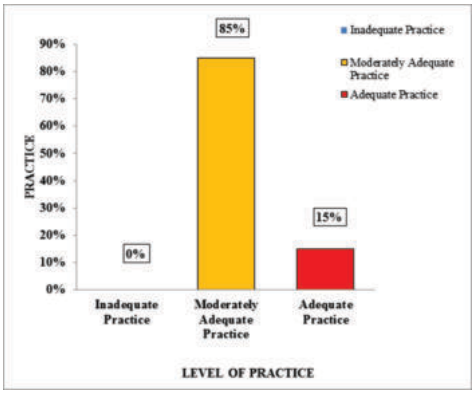

Table 4: Correlation between knowledge and practice scores of Standard Operating Procedure on infection prevention and control of COVID-19 among ICU staff Nurses.

N = 60

Variables	Mean	S.D.	Karl Pearson's Correlation Value
Knowledge	11.0	3.60	r = 0.331 p = 0.010, S**
Practice	8.36	1.19	

**p<0.01, S – Significant

Table 5: Association of level of knowledge of Standard Operating Procedure on infection prevention and control of COVID-19 among ICU Nurses with their selected demographic variables.

N = 60

Demographic Variables	Inadequate		Moderately Adequate		Adequate		Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							x^2=0.219 d.f=2 p=0.896 N.S
21 – 30	10	16.7	25	41.7	5	8.3	
31 – 40	4	6.7	13	21.7	3	5.0	
>40	-	-	-	-	-	-	
Gender							x^2=1.198 d.f=2 p=0.549 N.S
Male	0	0	2	3.3	0	0	
Female	14	23.3	36	60.0	8	13.3	
Professional qualification							x^2=3.200 d.f=4 p=0.525 N.S
GNM	10	16.7	18	30.0	3	5.0	
B.Sc. Nursing	2	3.3	11	18.3	3	5.0	
Post Basic B.Sc. Nursing	2	3.3	9	15.0	2	3.3	
M.Sc. Nursing	-	-	-	-	-	-	
Total years of work experience							x^2=14.854 d.f=6 p=0.021 S*
<1 year	5	8.3	2	3.3	0	0	
1 – 5 years	5	8.3	10	33.3	6	10.0	
5 – 10 years	4	6.7	15	25.0	1	1.7	
>10 years	0	0	1	1.7	1	1.7	
Type of ICU you are working							x^2=4.904 d.f=4 p=0.297 N.S
ICCU	5	8.3	13	21.7	6	10.0	
CTVS	3	5.0	10	16.7	1	1.7	
PostCov	6	10.0	15	25.0	1	1.7	
Any training attended regarding SOP – infection prevention and control of Covid-19							x^2=11.028 d.f=6 p=0.088 N.S
Yes	3	5.0	10	16.7	1	1.7	
1 session	0	0	7	11.7	2	3.3	
2 session	1	1.7	11	18.3	2	3.3	
>session	10	16.7	10	16.7	3	5.0	
No	-	-	-	-	-	-	

*p<0.05, S – Significant, N.S – Not Significant

Table 6: Association of level of practice of Standard Operating Procedure on infection prevention and control of COVID-19 among ICU staff Nurses with their selected demographic variables.

N = 60

Demographic Variables	Inadequate		Moderately Adequate		Adequate		Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							x^2=0.000 d.f=1 p=1.000 N.S
21 – 30	-	-	34	56.7	6	10.0	
31 – 40	-	-	17	28.3	3	5.0	
>40	-	-	-	-	-	-	
Gender							x^2=0.365 d.f=1 p=0.546 N.S
Male	-	-	2	3.3	0	0	
Professional qualification							x^2=1.084 d.f=2 p=0.582 N.S
GNM	-	-	25	41.7	6	10.0	
B.Sc. Nursing	-	-	14	23.3	2	3.3	
Post Basic B.Sc. Nursing	-	-	12	20.0	1	1.7	
M.Sc. Nursing	-	-	-	-	-	-	

Total years of work experience							x^2=3.188 d.f=3 p=0.364 N.S
<1 year	-	-	7	11.7	0	0	
1 – 5 years	-	-	26	43.3	5	8.3	
5 – 10 years	-	-	17	28.3	3	5.0	
>10 years	-	-	1	1.7	1	1.7	
Type of ICU you are working							x^2=3.774 d.f=2 p=0.152 N.S
ICCU	-	-	18	30.0	6	10.0	
CTVS	-	-	12	20.0	2	3.3	
PostCov	-	-	21	35.0	1	1.7	
Any training attended regarding SOP – infection prevention and control of Covid-19							x^2=0.635 d.f=3 p=0.888 N.S
Yes	-	-	11	18.3	3	5.0	
1 session	-	-	8	13.3	1	1.7	
2 session	-	-	12	20.0	2	3.3	
>session	-	-	20	33.3	3	5.0	
No	-	-	-	-	-	-	
Does your hospital have infection prevention and control committee?							-
Yes	-	-	51	85.0	9	15.0	
No	-	-	-	-	-	-	
Does your hospital have infection prevention and control guideline/ protocol?							-
Yes	-	-	51	85.0	9	15.0	
No	-	-	-	-	-	-	
Does your hospital have infection prevention and control nurse?							-
Yes	-	-	51	85.0	9	15.0	
No	-	-	-	-	-	-	

N.S – Not Significant

DISCUSSION –

The findings showed that in Demographic Data out of sixty respondents majority i.e 40 (66%) of the respondents were in the age group of 21- 30 years whereas 20 (34%) of the respondents were in the age group of 31-40 years . 58(97%) of the respondents were female and 2 (3%) of the respondents were male. In Educational qualification majority i.e 31 (52%) of the respondents were GNM , 16 (27%) were B.Sc Nursing , 13 (21%) were Post Basic B.Sc Nursing and also 7 (12%) of the respondents have less than 1 year working experience ,31 (52%) of the respondents have 1 – 5 years working experience , 20 (33%) of the respondents have 5-10 years working experience and 2(3%) of the respondents have >10 years experience. 24 (40%) of the respondents are working in ICCU, 14 (23 %) of the respondentsare working in CTVS and 22 (37%) of the respondents are working in Post – COVID 19 ICU and in any previous training attended: out of sixty respondents, majority i.e 37 (23%) of the respondents have attended the training , and 23 (38%) of the respondents have not attended the training and majority i.e 14 (38%) of the respondents have attended 1 session of the training , 14 (38%) of the respondents have attended more than 2 session of the training and 9 (24%) of the respondents have attended 2 session of the training regarding SOP on infection prevention and control of COVID-19

The study revealed that out of sixty respondents , majority 38 (63 %) had moderately adequate knowledge, 14(23%) had inadequate knowledge and 8(14%) had adequate knowledge of Standard Operating Procedure on infection prevention and control of COVID-19.The finding was in agreement with Piché PP, Groves HE, Kitano T, et al. conducted a cross-sectional survey of HCWs aimed to capture perspectives of healthcare workers (HCWs) on coronavirus disease 2019 (COVID-19) and infection prevention and control (IPAC) measures implemented of PPE during the early phase of the COVID-19 pandemic In total, 175 HCWs completed the survey between March 6 and March 10: 35 staff physicians (20%), 24 residents or fellows (14%), 72 nurses (41%), 14 respiratory therapists (8%), 14 administration staff (8%), and 14 other employees (8%). Most of the respondents were from the emergency department (n = 58, 33%) and the intensive care unit (n = 58, 33%). Only 86 respondents (50%) identified the correct donning order; only 60 (35%) identified the correct doffing order; but the majority (n = 113, 70%) indicated the need to wash their hands immediately prior to removal of their mask and eye protection. Also, 91 (54%) respondents felt comfortable with recommendations for droplet and/or contact precautions for routine care of patients with COVID-19. As a result this study shows thart HCW occupation and concerns about contracting COVID-19 outside work were associated with nonacceptance of the recommendations (P = .016 and P = .036 respectively).[6]

The study revealed that out of 60 respondents , majority 51 (85 %) had moderately adequate practice and 9(15%) had adequate practice of Standard Operating Procedure on infection prevention and control of COVID-19. The finding was in agreement with Kassie BA et al (2020) who conducted a descriptive cross sectional study on knowledge, attitude, practice and psychological response about COVID-19 among 408 nurses in hospital Ethiopia where they reported out of 415 nurses, 307(74%), 278(67%),299(72%) and 354(85.3%) had good knowledge, good infection prevention practice, a favourable attitude and disturbed psychological response towards COVID-19 respectively.[7]

The correlation between knowledge and practice, Karl Pearson's Correlation Coefficient was used to find out the relationship between knowledge and practice of ICU nurses regarding SOP on infection prevention and control of COVID-19.The calculated coefficient correlation value was 0.331 which shows a positive correlation between knowledge and practice. This revealed that more knowledge leads to better practice. The present study was supported by Papagiannis D, Malli F, Raptis DG, Papathanasiou IV, Fradelos EC, Daniil Z, Rachiotis G, Gourgoulianis KI. conducted a descriptive study of Knowledge, Attitudes, and Practices towards New Coronavirus (SARS-CoV-2) of Health Care Professionals in Greece before the Outbreak Period. 461 health care workers returned the questionnaire and were included in the analysis (mean age ± SD: 44.2 ± 10.78 years, 74% females). The majority were nurses (47.5%), followed by physicians (30.5%) and paramedics (19%). The majority of subjects (88.28%) had a good level of knowledge (knowledge score equal to 4, or more). The majority of participants (71%) agreed with the temporary traveling restrictions ban. The uptake of a future vaccine against SARS-CoV-2 was estimated at 43%. Knowledge score was significantly associated with both attitudes score ($p = 0.011$) and practices score ($p < 0.001$), indicating that subjects with a high knowledge score demonstrated a more positive perception on preventive measures and would practice more preventive measures. Attitudes score was significantly associated with practices score ($p = 0.009$) indicating that subjects with a higher attitudes score are more likely to perform practices towards the prevention of SARS-CoV-2 transmission. This study shows that there is a high level of knowledge concerning SARS-CoV-2 pandemic among Greek health care workers and this is significantly associated with positive attitudes and practices towards preventive health measures. The high level of knowledge of health professionals about SARS-CoV-2 may have contributed considerably to the successful management of the pandemic in Greece.[8]

The association was statistically tested using chi square and the results shows that there was significant association between knowledge and total years of working in CTVS, ICCU and post- COVID-19 ICU regarding SOP on infection prevention and control of COVID-19 but shows no association with age, educational qualification, total years of

experience, type of ICU and any training attended regarding SOP on IPC of COVID-19

CONCLUSION-

In knowledge, the study revealed that out of 60 respondents , majority 38 (63 %) had moderately adequate knowledge, 14(23%) had inadequate knowledge and 8(14%) had adequate knowledge of Standard Operating Procedure on infection prevention and control of COVID-19.In practice , the study revealed that out of 60 respondents , majority 51(85%) had moderately adequate practice and 9 (15%) had adequate practice of Standard Operating Procedure on infection prevention and control of COVID-19.The co-relationship between knowledge and practices were 0.331 which was moderately positive correlation. There was significant association of knowledge with total years of working in CTVS, ICCU and post-COVID 19 ICU.Thus, this study gives the area to improve in knowledge and practice of staff nurses regarding SOP on infection prevention and control of COVID-19.therefore, continual education to the nurses does go long way in increasing their knowledge and practice to prevent infection.

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