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Knowledge Practice Gap Among Nurses Towards COVID-19 Patients' Dead Body Care in a Tertiary Care Hospital

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Abstract: COVID-19 due to SARS-CoV-2 is a global pandemic that presents a serious challenge from many angles for healthcare professionals. The virus causes a potentially fatal disease that is easily transmitted among patients and caregivers, hence specific dead body care is required for such patients. Our study was conducted to identify knowledge, attitude, and practice regarding COVID-19 dead body care among hospital nursing personnel. A cross sectional survey-based study was performed involving 282 nurses who worked in COVID-19 units during data collection from July 2020 to September 2020. The online structured questionnaire was based on world health organization guidelines, institutional infection control protocols, and course material regarding emerging respiratory diseases including COVID-19. We found that work experience in the COVID-19 unit had a significant impact on knowledge and practice regarding COVID-19 dead body care. Similarly, we observed that training improved the knowledge and practice of nursing personnel regarding dead body care. Good knowledge, attitude, and practice were observed in experienced and trained nurses (p-value <0.005). No significant changes were observed with age, gender, and education qualification. Overall knowledge, attitude, and practice regarding COVID-19 dead body care were moderate to good. Adequate training among nurses should prevent the transmission of disease due to occupational exposure.

Keywords: Contact Transmission, Corona Virus Disease 2019, Dead Body, Healthcare Workers, and Questionnaire Study

Introduction

The COVID-19 pandemic is an ongoing global pandemic caused by SARS-COV-19 and was first identified during an outbreak in Wuhan, China. The 1st case in India was reported in Thrissur district in Kerala followed by multiple cases, as of the 28th of May 2022, there were 43147530 confirmed cases and 524539 deaths (Haque *et al*., 2020; Maheshwari *et al*., 2020). There exist some uncertainties in the natural history of COVID-19 including source, transmissibility mechanisms, viral shedding, and persistency of the virus in the environment. In healthcare settings, aerosol-generating procedures, as well as the surfaces, fomites, and contaminated hands of Healthcare Workers (HCWs) have a role in the spread of disease. Since it is unclear how long the virus stays in the victim's body and the absence of data on infection from dead bodies, the WHO recommends the safe handling of bodies to prevent the possible spread of infection. Therefore, the safety and well-being of persons handling the dead bodies should be the priority, which includes the use of Personal Protective Equipment (PPE) and placement of the dead body in an

impermeable bag to prevent leakage of body fluids before being moved from the isolation area or patient care room (Hussain *et al*., 2020; Sharma *et al*., 2022; Patidar *et al*., 2020).

For aerosol-generating procedures for all confirmed or suspected COVID-19 patients, all HCWs should follow the standard, contact, droplet, and airborne precautions. All the persons including nursing staff handling the victims' bodies in the isolation area, mortuary, ambulance, during crematorium and burial ground should be trained in infection prevention and control practices. During the hospital, the role of nursing staff remains crucial for dead body handling. Thus, this study aims to describe nurses' knowledge, attitude, and practice gaps concerning COVID-19 victims' body care and factors that affect the above-mentioned precautions. The information resulting from this study can serve as a vital tool to formulate relevant policies and guidelines during and after the outbreak, guide the nurses to prioritize self-protection and avoid occupational exposure (Padmanaban *et al*., 2022; WHO, 2022; Saha *et al*., 2020).

Materials and Methods

A single center cross sectional survey-based study was conducted in the tertiary health care center. To implement social distancing and to avoid the spread of COVID-19, it was not feasible to collect self-reported data-based surveys therefore the investigators used an online method of data collection. The sample size was a universal sample of all healthcare workers posted in COVID-19 units during data collection from July 2020 to September 2020. The survey commenced with 282 nurses posted in the COVID-19 units and the required sample size was achieved on 20th September 2020. All nursing officers working in COVID-19 units were recruited as study participants in the present study. A questionnaire was designed on google forms and a link was shared with WhatsApp groups and personal messages to the COVID-19-unit staff.

Table 1: Criteria of score range with a cut-off level

S.N.	Criteria	Score range	Cut off level	
1	Knowledge	0-8	Good Knowledge ≥5	Poor knowledge <5
2	Practice	0-17	Good practice ≥11	Poor practice <11
3	Attitude	13-80	Positive attitude ≥48	Negative attitude <11x

Measurement and Data Collection

The structured questionnaire was prepared after reviewing published literature based on WHO guidelines, institutional infection control protocols, and course material regarding emerging respiratory diseases including COVID-19 (Patidar *et al*., 2020; Padmanaban *et al*., 2022; WHO, 2022; Saha *et al*., 2020). An initial draft questionnaire was validated by experts from the field of internal medicine, microbiology, nursing, and forensic medicine. They evaluated the questionnaire for its simplicity, relativity, and importance. The questionnaire consists of four parts viz. socio-demographics, knowledge, attitude, and practice-related items (Appendix 1). The response of each participant was categorized based on a predefined cut-off level as mentioned in Table 1.

Ethical Considerations

The ethical clearance was obtained from the institutional ethical committee vide letter no AIIMS/IEC/20/558 dated 22/08/2020 before conducting the study. The study questionnaire contained a consent section that stated the purpose, nature of objectivity, voluntary participation, declaration of confidentiality, and anonymity of the study.

Results

The response data of knowledge, attitude, and practices regarding COVID-19 dead body care was collected from 282 nurses. The demographic profile of the study participants along with its association with knowledge is mentioned in Table 2. The majority of nurses were having work experience in COVID-19 units. The nurses with less experience (0-30 days) had poor knowledge scores (P = 0.0055).

The relation of attitude with various demographic variables is shown in Table 3.

The male nurses were having good practice compared to the females (P = 0.009) (Table 4). The age, educational qualification, years of nursing experience, dedicated COVID-19 training, and experience in handling other infections had no significant practice gaps in dead body care. The work experiences in the COVID-19 unit and experience handling the COVID-19 dead body had significant practice gaps (P<0.005).

Table 2: Association between demographic profile with knowledge of nurses (n=282)

	Good knowledge		Poor knowledge				
Variable	n	%	n	%	Total	OR (95% CI)	P-value
Age							
21-30 yr	181	71.3	73	28.7	254	1	0.4400
>30 yr	18	64.3	10	35.7	28	1.37(0.60-3.12)	
Gender							
Male	137	71.7	54	28.3	191	1	
Female	62	68.1	29	31.9	91	1.18(0.69-2.04)	0.5300
Years of experience in current profession							
<2 yr	84	68.9	38	31.1	122	1.18(0.70-1.99)	0.5100

Table 2: Continue

2-5 yr	113	72.4	43	27.6	156	1	
>5 yr	2	50	2	50.0	04	2.62(0.35-19.2)	0.3400
Work experience in COVID-19 designated area							
0-30 days	24	52.2	22	47.8	46	2.65(1.33-5.27)	0.0055
31-60 days	48	73.8	17	26.2	65	1.02(0.52-1.99)	0.9400
61-80 days	20	74.1	7	25.9	27	1.01(0.39-2.58)	0.9700
>80 days	107	74.3	37	25.7	144	1	
Educational Qualification							
General nursing midwifery	28	58.3	20	41.7	48	1.93(1.01-3.68)	0.4300
BSc/MSc nursing	171		63		234	1	
Experience in handling dead bodies of COVID-19 patients							
Yes	151	83.0	31	17.0	182	1	
No	48	48.0	52	52.0	100	5.27(3.04-9.15)	<0.0010
Experience in handling dead bodies of SARS, MERSA, Swine Flu, NIPAH, EBOLA							
Yes	104	86.7	16	13.3	120	1	
No	95	58.6	67	41.4	162	4.58(2.48-8.45)	<0.0010
Any training							
Yes	119	85.0	21	15.0	140	1	
No	80	56.3	62	43.7	142	4.39(2.48-7.76)	<0.0010

Table 3: Association between demographic profile with the attitude of nurses (n = 282)

	Positive attitude		Negative attitude				
Variable	N	%	N	%	Total	OR (95% CI)	P-value
Age							
21-30 yr	80	31.5	174	68.5	254	1.88(0.85-4.14)	0.1150
>30 yr	13	46.4	15	53.6	28	1	
Gender							
Male	70	36.6	121	63.4	191	1	
Female	23	25.3	68	74.7	91	1.71(0.98-2.98)	0.0580
Years of experience in current profession							
<2 yr	33	27.0	89	73.0	122	8.09(0.81-80.5)	0.0740
2-5 yr	57	36.5	99	63.5	156	5.21(0.52-51.2)	0.1570
>5 yr	3	75.0	1	4.0	4	1	
Work experience in COVID-19 designated area							
0-30 days	18	39.1	28	60.9	46	1	
31-60 days	19	29.2	46	70.8	65	1.55(0.70-3.45)	0.2770
61-80 days	10	37.0	17	63.0	27	1.09(0.41-2.91)	0.8590
>80 days	46	31.9	98	68.1	144	0.067(0.03-0.14)	<0.0001
Educational Qualification							
General Nursing Midwifery	23	47.9	25	52.1	48	1	
BSc Nursing	70		164		234	2.155(1.14-4.05)	0.0170
Experience in handling dead bodies of COVID-19 patients							
Yes	46	25.3	136	74.7	182	2.62(1.56-4.39)	0.0002
No	47	47.0	53	53.0	100	1	
Experience in handling dead bodies of SARS, MERSA, Swine Flu, NIPAH, EBOLA							
Yes	22	18.3	98	81.7	120	3.47(1.99-6.06)	<0.0001
No	71	43.8	91	56.2	162	1	
Any training							
Yes	36	25.7	104	74.3	140	1.93(1.16-3.21)	0.0100
No	57	40.1	85	59.9	142	1	

Table 4: Association between demographic profile with the practice of nurses (n = 282)

	Good practice		Poor practice				
Variable	N	%	N	%	Total	OR (95% CI)	P-value
Age							
21-30 yr	230	90.6	24	9.4	254	2.81(0.366-21.6)	0.3100
>30 yr	27	96.4	1	3.6	28	1	
Gender							
Male	182	95.3	9	4.7	191	1	
Female	75	82.4	16	17.6	91	4.31(1.82-10.19)	0.0009

Table 4: Continue

Years of experience in current profession							
<2 yr	111	91.0	11	9.0	122	0.92(0.04-18.35)	0.9600
2-5 yr	142	91.0	14	9.0	156	0.91(0.04-17.87)	0.9500
>5 yr	4	100.0	0	0.0	4	1	
Work experience in COVID-19 designated area							
0-30 days	43	93.5	3	6.5	46	1.93(0.44-8.44)	0.3770
31-60 days	54	83.1	11	16.9	65	5.66(1.87-17.06)	0.0021
61-80 days	21	77.8	6	22.2	27	7.94(2.22-28.35)	0.0014
>80 days	139	96.5	5	3.5	144	1	
Educational qualification							
General nursing midwifery	40	83.3	8	16.7	48	2.55(1.03-6.31)	0.4200
BSc nursing	217		17		234	1	
Experience in handling dead bodies of COVID-19 patients							
Yes	176	96.7	6	3.3	182	1	
No	81	81.0	19	19.0	100	6.88(2.64-17.87)	0.0001
Experience in handling dead bodies of SARS, MERSA, swine flu, NIPAH, EBOLA							
Yes	114	95.0	6	5.0	120	1	
No	143	88.3	19	11.7	162	2.52(0.97-6.52)	0.5600
Any training							
Yes	131	93.6	9	6.4	140	1	
No	126	88.7	16	11.3	142	1.84(0.78-4.33)	0.15700

Discussion

This study examined the knowledge, practice, and attitude of nurses regarding COVID-19 dead body care. Dead body care is an essential part of the end-of-life care. In this study, it was found that work experience in the COVID-19 unit has a significant impact on knowledge practice regarding COVID-19 dead body care. Similarly, it was observed that training improved the knowledge practice of nursing personnel regarding dead body care. There was good knowledge among those who worked in COVID-19 areas. Previous studies had suggested that effective and appropriate health education and training programs improve COVID-19 knowledge and safe practices (Saha *et al*., 2020; WHO, 2008). The COVID-19 infection may lead to many super-added infections and other health problems. The training of health care professionals in handling one type of infection like Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Nipah Virus (NiV), etc., affects their ability to handle similar infections (Wang *et al*., 2020). Similarly, we observed that those who handle other infections had good knowledge, positive attitude, and good practices score.

It is well-established fact that training improves knowledge, practice, and attitude (Reda *et al*., 2010; Kafle *et al*., 2020). Similar findings were observed among nurses while handling COVID-19 dead body care except for practices. The chances of infections in nurses were more as they were involved in direct care to the patient and were having prolonged stays during this global pandemic. Preparation for the response is a vital step to cope effectively and then deal with actual health emergencies in the case of developing countries like India. Readiness for combating infectious diseases such as COVID-19 begins with good understanding, positive thinking, and safe and better practices. Similarly, in the study attitude and practice were assessed regarding the handling of dead body care which gives direct exposure to the same (Bhagavathula *et al*., 2020; Lee *et al*., 2020). The dead body was considered infected and caring for a dead body with COVID-19 infection for nurses requires a positive attitude with good knowledge and practical skills (Gulilat and Tiruneh, 2014). The care during this pandemic and specific protection with preventive aspects for healthcare providers have a primary role in the reduction of infection among healthcare professionals.

Limitation

a) The study was conducted in a single institute with limited sample subjects, which should be multicentric to avoid selection bias
b) There was no specific training provided regarding COVID-19 specific dead body care except for the circulation of WHO guidelines on how to care for COVID-19 dead bodies, hence training could be part of this type of study

Conclusion

Overall knowledge, attitude, and practice regarding COVID-19 dead body care among nurses were moderate to good. Adequate training among nurses and other health care professionals may improve knowledge and practice. This may have an impact on improving attitude and may prevent transmission of disease due to occupational exposure. Future studies may be planned with multicentre involvement and a large sample size.

Declarations

No funding was received to assist with the preparation of this manuscript. The authors have no conflicts of interest to declare that are relevant to the content of this article and the manuscript is written under ethical guidelines.

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Author's Contributions

Girraj Saini, Mahendra Singh, Maneesh Sharma and Pankaj Punjot: Data collection, analyzed, drafted, and approved.

Prasan Kumar Panda, Raviprakash Meshram and Puneet Kumar Gupta: Concept, analyzed, critically reviewed, approved.

Ethics

Present study was approved by institute ethical committee and participants provided their written informed consent to be the part of the study.

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Appendix 1:

Study title: Knowledge, attitude, and practices of health care professionals towards "COVID-19 dead body care" in a tertiary care setting: A cross-sectional study

ID No:
Date: Time:

Instructions, please read the statement carefully and tick mark (√) for the most appropriate option and fills in the blanks:

A. Socio-Demographic profile

Q1. Age in years:
Q2. Gender?

a) Male
b) Female

Q.3. Designation

a) Faculty
b) Resident doctor
c) Nursing officer
d) Technician
e) Ward attendant
f) Housekeeping
g) Mortuary staff

Q.4. Work experience:

a) <2 years
b) 2-5 years
c) 5-10 year
d) >10 year

Q.5. Work experience in COVID-19 designated area:

a) 0-15 days
b) 16-30 days
c) 31-45 days
d) >46 days

Q.6. Educational qualification:

a) MBBS
b) MD/MS
c) GNM
d) M.Sc Nursing
e) B.Sc Nursing
f) Senior Secondary
g) Diploma in any ……..

Q.7. In the past month, have you taken care of the dead body of a COVID-19 suspected or confirmed patient?

a) Yes
b) No

Q.8. Have you undergone any CME/CNE on caring for a dead COVID-19 suspected or confirmed patient:

a) Yes
b) No

B. Knowledge based questionnaire:

1. Which organ of Covid-19 suspected or confirmed patient's dead body is considered most infectious? a) Liver

a) Lungs
b) Stomach
c) Kidney

2. Human coronaviruses can remain infectious on surfaces (like bedside rails, door knobs, IV stand, etc.,) for up to how many days?

a) 7 days
b) 9 days
c) 14 days
d) 30 days

3. Standard precautions to be followed by health professionals while handling dead bodies of COVID-19 suspected or confirmed patients:

a) Yes
b) No

4. Contaminated equipment used in dead patient care can increase the risk of communicable diseases like COVID-19?

a) Yes
b) No

5. Dead bodies of COVID-19 suspected or confirmed cases should be stored in which of the following temperature:

a) 0°-4°C
b) 8>°C
c) Room temperature

6. In terminal cleaning of all surfaces in the isolation area (floors, bed, railings, side tables, IV stands, etc.,) of COVID-19 suspected or confirmed patients should be wiped with 1% sodium hypochlorite solution for which of the following duration:

a) 1 min
b) 15 min
c) 30 min
d) 1 h

7. After terminal cleaning dwell time to be given for fogging at least?

a) 15 min
b) 30 min
c) 60 min
d) 90 min

8. COVID-19 virus is primarily transmitted between people through respiratory droplets, through fomites in the immediate environment around the infected instruments or dead body.

a) Yes
b) No

9. Which of the following procedure primarily predispose health care professionals to get infected with COVID-19?

a) Suctioning, nebulization, and CPR
b) Medication administration
c) Suturing
d) Checking of vital signs

10. ICD codes used for mortality coding as the cause of death due to COVID-19?

a) J80
b) U07.0
c) U07.1
d) U07.2

C. Attitude based questionnaire

S. No.	Attitude Items	SD	D	N	A	SA
1.	Prevalence of COVID-19 can be reduced by the active participation of HCWs in hospital infection control programs?					
2.	When a confirmed COVID-19 patient expired, in your ward do you believe that you can still get corona infection during dead body care?					
3.	Once people are cured of COVID-19, are they likely to get Coronavirus again?					
4.	All staff identified to handle dead bodies in the isolation area, mortuary, and ambulance and those workers in the crematorium/burial ground should be trained in infection prevention control practices.					
5.	Do you think that the PPE kit available is of good quality and fit for purpose of dead body care of COVID-19 positive?					
6.	Religious rituals such as reading religious scripts, sprinkling holy water, and any other last rites that do not require touching of the body can be allowed?					
7.	All suspected or quarantined patients if died will be considered as positive dead body management same as COVID-19 positive?					
8.	According to your belongings of the deceased person need to be burned or otherwise disposed of?					
9.	The ash does not pose any risk and can be collected to perform the last rites?					
10.	Handling/facing the dead body of a COVID-19 positive is a very fear-able condition					
11.	Please indicate the extent to which you view the COVID-19 outbreak as having either a positive or negative impact on your life					
12.	How confident that you can protect yourself and your family from becoming infected with COVID-19 in the future? Are you?					
13.	As a health care professional do you believe that you are at risk of getting an infection due to direct involvement in COVID-19 dead body care?					

D. Practices based Questionnaire

1. Who informs to the patient relative immediately regarding the death of a patient and reports to the mortuary for receiving the body for cremation or cemented burial:

a) Treating faculty
b) Resident doctor
c) Nursing officer

2. From whom is confirmed to be obtained before reporting if death was due to COVID-19 or not:

a) Treating faculty:

b) Resident doctor
c) Nursing officer

3. How you are reporting about COVID-19 patient death:

a) Sending a hard copy to the administration
b) Telephonically
c) Email and WhatsApp message

4. How many additional forms you are filling in AIIMS Rishikesh for reporting COVID-19 patient death

a) NCDC, IDSP death reporting, and CRF Module 3
b) NCDC, IDSP death reporting, and SRF Module 3
c) Death report, death certificate, and death summary 5. Warping of COVID-19 dead bodies done in:

a) Cloth sheet
b) Plastic sheets
c) Leak proof plastic dead body bag

6. Which solution using for deep cleaning and carbonization:

a) 0.1% Hypochlorite solution
b) 1% Hypochlorite Solution
c) Tap water

7. Are you disinfecting the dead body before transferring it to the mortuary area?

a) Yes
b) No
c) Some time

8. Do you allow relatives to see the body and not touch it?

a) Yes
b) No
c) Some time

9. Do you allow adults >60 years and immune compromised persons directly interact with the body?

a) Yes
b) No
c) Some time

10. In COVID-19 cases, are you filing police intimation for both suspect/positive deaths before handing over dead bodies to the mortuary?

a) Yes
b) No
c) Some time

11. In COVID-19 confirm death case, are you initiating MLC (medico legal case) form:

a) Yes

b) No
c) Some time

12. Do you obtain an undertaking/consent form beforehand over the dead body to a patient relative under police custody?

a) Yes
b) No
c) Some time

13. After the death of a patient in a COVID-19 ward/ICU are you informing the patient's relative, hospital administration, and Police?

a) Yes
b) No
c) Some time

14. Have the health care worker place the dead body in a leak proof plastic body bag and the exterior of the body bag be decontaminated with 1% hypochlorite:

a) Yes
b) No
c) Some time

15. Exuding wounds of the dead body covered with absorbent gauze and secured with an occlusive dressing?

a) Yes
b) No
c) Some time

16. Are you ensuring that anyone involved in transferring the dead body is aware of confirmed or suspected COVID-19 status?

a) Yes
b) No
c) Some time

17. Are you placing a tag (name, UHID, ward, and contact no of relative) on the dead body before sending it to the mortuary?

a) Yes
b) No
c) Some time

18. The medical and nursing teams are practicing counseling of patient's family about the patient's condition and that death is expected and communication is clearly documented within the healthcare record:

a) Yes
b) No
c) Some time