

Tackling the Italian emergency 2019- nCoV: nurses' knowledge, attitudes and behaviors

Debora Rosa¹, Giulia Villa², Noemi Giannetta³, Sara Dionisi⁴, Serena Togni⁵, Loris Bonetti⁶⁻⁷, Stefano Terzoni⁸, Marco Di Muzio⁹, Emanuele Di Simone¹⁰

¹ Department of Cardiovascular, Neural and Metabolic Sciences, IRCCS Istituto Auxologico Italiano, San Luca Hospital, Milan, Italy; ² Center for Nursing Research and Innovation; Vita-Salute San Raffaele University, Milan, Italy; ³ UniCamillus - Saint Camillus International University of Health and Medical Sciences; ⁴ Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy; ⁵ Foundation I.R.C.C.S. National Cancer Institute, Milan, Italy; ⁶ Nursing Research Competence Centre, Department of Nursing, Ente Ospedaliero Cantonale, Bellinzona, Canton Ticino, Switzerland; ⁷ Department of Business Economics, Health and Social Care, University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Manno, Switzerland; ⁸ San Paolo Bachelor School of Nursing, San Paolo Teaching Hospital, Milan, Italy; ⁹ Department of Clinical and Molecular Medicine, Sapienza University of Rome, Rome, Italy; ¹⁰ Nursing, Technical, Rehabilitation, Assistance and Research Department - IRCCS Istituti Fisioterapici Ospitalieri - IFO, Rome, Italy

Abstract. *Background and aim:* The aim was to understand the knowledge, attitudes, and behaviors of Health Care workers regarding the Novel Coronavirus 2019 cases at the start of the diffusion of the disease in Italy. *Methods:* Cross-sectional survey of nurses working in Italian hospitals. *Results:* Most of the sample showed good knowledge and behaviors about the new virus and good attitudes. Logistic regression analysis demonstrated that predictive variables of knowledge, attitude, and behavior were: educational background, work experience years and age of nurses. *Conclusions:* This study is the first one in a time of a full health emergency. It would be appropriate to develop further studies to better analyze the skills implemented to tackle Novel Coronavirus 2019 disease. Novel Coronavirus 2019 pandemic has put on health personnel a considerable workload. Despite this, the Italian nursing staff has been showing excellent knowledge, attitude, and good behavior in the management of this pandemic. (www.actabiomedica.it)

Key words: COVID-19, KAB theory, Nursing management, Knowledge, Attitudes

Introduction

The new pandemic virus of Novel Coronavirus (2019-nCoV) represents a serious public health problem with enormous economic, social, and health consequences (1,2). Currently, therapeutic strategies to deal with the infection are support, and prevention aimed at reducing transmission in the community (3). Despite several advances in therapeutic strategies, there are currently almost 2 million deaths in the world, including those among health care workers (HCW) (4). HCW were not well prepared for this new and sudden coronavirus epidemic, especially outside infectious

diseases departments (5,6). Probably the causes of this infection on the HCW side were: lack of awareness among HCWs about taking precautions and inadequate training in the use of personal protective equipment (PPE) (7,8).

In Italy political and health authorities made incredible efforts to contain a shock wave that is still putting the health system to the test. Extraordinary measures were adopted to tackle the pandemic. Among these, (9,10) the hiring of HCW included the recall of retired health personnel. 845 million euros were allocated to strengthen the National Health Service for 2020 (of which 660 million for staff and 185 million

for the purchase of intensive care equipment) (10,11). Consequently, the number of nurses dedicated to the care of 2019-nCoV positive patients was increased and so was the need for training for professionals (12,13). The aim of this research was to understand the knowledge, attitude, and behavior of HCW with regard to a 2019-nCoV suspected or confirmed case at the start of the disease diffusion in Italy, in order to plan appropriate training interventions.

Methods

A cross-section survey design was employed. This study was performed according to the Declaration of Helsinki and the ethical standards required by the WHO, as stated in “Ethical standards for research during public health emergencies: Distilling existing guidance to support COVID-19” (18).

Study population

The survey was addressed exclusively to Italian nurses. Therefore students, nurses working abroad, and other health workers were excluded from the study. The final convenience sample (1027), was estimated based on the total number of Italian registered nurses (450,000), in order to obtain statistical significance with a relative confidence interval of 95% and confidence level of 5%.

Data collection

Authors developed a questionnaire to assess the knowledge, attitudes and behaviors (KAB theory) (14) regarding the pandemic. It was administered via Google Forms and delivered by social media held over the period from March 9th to March 14th, 2020, the first days of the Italian lockdown. The questions were based on European Centre for Disease Prevention and Control’s (ECDC) technical report (15), World Health Organization’s (WHO) guideline (16) and Italian Ministry of Health (17).

The websurvey, anonymous and self-administered, was composed by a demography and social information section (A) and a section (B) to evaluate and measure knowledge and behavior of Italian

nurses. “Section B” was built after a literature review and is based on clinical guidelines published on institutional (15–17) and KAB theory (14). The questionnaire consisted of 13 questions (Table 2), seven related to the knowledge area (1,2,3,4,5,8,9), two to attitudes (6,10) and four for practice areas (7,11,12,13).

Statistics

Analysis of this study was performed by means of descriptive analysis, Spearman’s rank correlation test, and multivariate logistic regression analysis. All the variables have been included in the logistic regression model and only statistically significant differences between the variables will be discussed. A $P < 0.05$ is considered statistically significant. Statistical Package for Social Science 25.0 (SPSS®) was used for all analyses.

Results

The 1016 participants working in Northern Italy are 49.7% (N=505), the 75% of the sample (N=762) work in Hospital settings, University Hospital, Research Hospitals, while the remaining 25% (N=254) work in private hospitals or are self-employed. 85.2% (N=866) had not received any training (specific courses also online) on 2019-nCoV. Socio-demographic characteristics are included in the Table 1.

The items of the questionnaire and its related descriptive statistical are shown in Table 2.

Knowledge about COVID-19

Most of the sample showed good knowledge about the new virus. 87.3% (n=887) was aware the correct mode of transmission; 90.5% (n=919) was aware of its signs and symptoms. 81.4% had a good knowledge of patients at greater risk of contracting the disease and 95.2% stated that the virus can affect people of any age. 69.4% of respondents said that most people (80%) recover from the disease without intensive care and about 1 of 6 people with 2019-nCoV became critically ill and develop breathing difficulties (76.3%).

Table 1. Sociodemographic characteristics

	N	%	Average	SD(±)	Missed
<i>Female</i>	767	75.5			
<i>Male</i>	249	24.5			
<i>Age</i>			38.21	11.5	
<i>Experience (years)</i>			13.81	12	2
<i>Bachelor degree (or similar)</i>	768	75.6			
<i>Master Degree</i>	83	8.2			
<i>Advanced study</i>	64	6.3			
<i>Bachelor degree+ Advanced study</i>	63	6.2			
<i>Master Degree+ Advanced study</i>	7	0.7			
<i>Bachelor degree+ Master Degree+ Advanced study</i>	8	0.8			
<i>Experience working in infection diseases or ICU</i>	387	38.1			
<i>19-NCov course</i>	150	14.8			
<i>Northern</i>	505	49.7			
<i>Middle</i>	375	36.9			
<i>Southern</i>	99	9.7			

Table 2: Items of the questionnaire

ID	Questions	Right % (N)	Wrong % (N)	Missed % (N)
1	<i>What is the transmission of Novel Coronavirus?</i>	87.3 (887)	12.7 (129)	
2	<i>What are signs and symptoms of the disease?</i>	90.5 (919)	9.5 (97)	
3	<i>People at risk to developing are considered to be those how have to travelled to areas where the infections is being transmitted from person to person or...</i>	83.4 (847)	16.6 (169)	
4	<i>People of all ages can be infected with the virus (and contract the disease).</i>	95.2 (967)	4.8 (49)	
5	<i>Which of this seem to be subject to more severe clinical manifestation after infection?</i>	81.4 (827)	18.2 (185)	0.4 (4)
6	<i>People with mild symptoms (prodromal phases) of the disease can transmit the virus?</i>	95.8 (973)	4.2 (43)	
7	<i>Which personal protective equipment (PPE) are best suited for virus protection?</i>	77.9 (791)	22.1 (225)	
8	<i>Most people (80%) recover from the disease without intensive care.</i>	69.4 (705)	30.6 (311)	
9	<i>About 1 of 6 people with COVID-19 became critically ill and develop breathing difficulties.</i>	76.3 (775)	23.7 (241)	
10	<i>In case of suspected NCoV infection, nurse must make sure that all patients cover their nose and mouth with a tissue or the inside of their elbow when coughing or sneezing?</i>	87.4 (888)	12.6 (128)	
11	<i>Patients with suspected NCoV infection... they must not stop in waiting or public areas; they must always use a medical mask to avoid diffusion; they must use a medical mask while in waiting or public areas; they must follow medical instructions.</i>	76.6 (778)	23.4 (238)	
12	<i>Nursing care to suspected or confirmed patients... it must be restricted only employees on shift; maybe carried out by all employees on shift with PPE; it must only be carried out by some designated nurses; it must only be carried out by nurses indicated by infectious disease specialist.</i>	25.3 (257)	74.7 (759)	
13	<i>Suspected or confirmed patients should be provided using... medical mask; FFP2 mask and a waterproof suite, but only in confirmed case; at least one FFP2 mask, goggles and a clean nonsterile long sleeved gown; medical mask and facial shield to prevent contamination of the mucosa.</i>	77.1 (783)	22.9 (233)	

Attitude on 2019-nCoV

95.8% reported that people with mild symptoms (prodromal phases) of the disease can transmit the virus. In case of suspected infection, 87.4% stated that nurses must make sure that all patients cover their nose and mouth with a tissue or the inside of their elbow when coughing or sneezing.

Behavior on 2019-nCoV

The 77.9% of respondents knew the most appropriate personal protective equipment (PPE) to use during service. 76.6% of our sample agreed with the correct behavior for patients (it is not to assemble in waiting zones or public areas; always use a medical mask; follow medical instructions). The 25.3% claimed that nursing care to suspected or confirmed patients must be restricted to the careers to the shift only; maybe carried out by all HCW on shift with PPE. Suspected or confirmed patients should be provided with a medical mask; FFP2 mask and a waterproof suite, but only in confirmed case; at least one FFP2 mask, goggles and a clean nonsterile long-sleeved gown; medical mask and facial shield to prevent contamination of the mucosa, according to 77.1% of our sample.

Predictive variables of KAB

In question one the correct answer was associated with Bachelor's Degree and work experience years ($P=0.047$; OR: 0.94; IC: 0.86-0.99) or having attended a course on 2019-nCoV ($P=0.030$; OR: 9.736; IC:1.24-76).

The lack of knowledge of the signs and symptoms of 2019-nCoV (question 2) is associated with the nurse's age ($P<0.001$; OR: 0.956; IC: 0.939 - 0.974) and work experience in years (OR: 0.959; IC: 0.943-0.975; $P<0.01$).

In the question about virus infection (question 4), women have a 0.401 lower probability of answering the question correctly than men (OR: 0.670; CI: 0.471-0.952; $P=0.025$), and as the age of nurses increases, the probability of answering the question correctly

decreases by 0.015 (OR: 0.985; CI: 0.972-0.999; $P=0.034$). Finally, having attended advanced training after a Bachelor's Degree, the probability of answering the question correctly decreases by 1.569 (OR: 0.208; IC: 0.051- 0.843). In question 7, the younger nurses group recognized among those listed the main virus protection devices compared to their older colleagues (OR: 0.953; IC: 0.941-0.966; $P<0.001$). While work experience has a reverse influence on the recognition of the main protection devices (OR: 0.957; IC: 0.945 - 0.969; $P<0.001$).

In question 8, older nurses are more likely to answer the question correctly (OR: 1,027 - IC: 1,015 - 1.04; $P<0.001$) because work experience years predicts correctness of the answer (OR: 1,028; IC: 1,015-1,040; $P<0.001$). This variable (work experience years) is also significant in question 9 (OR: 0.987; CI: 0.976-0.999), question 10 (OR: 0.981; CI: 0.966 - 0.995), question 11 (OR: 0.986; CI: 0.975 - 0.998) and question 13 (OR: 0.986; CI: 0.974 - 0.997). Whereas the oldest age shows significance in question 10 (OR: 0.976 - CI: 0.961-0.992), question 11 (OR: 0.982 - CI: 0.970-0.994) and question 13 (OR: 0.987 - CI: 0.974-0.999). In the question 12 the lack of experience in intensive settings predicts a correct answer (OR: 0.690; IC: 0.518 - 0.919). Question 3 and question 6 did not show any significance in any of the statistical models.

Discussion

The majority of the nursing sample (84.91%) involved in this study had extensive knowledge of 2019-nCoV disease; on the other hand, 85.2% of the sample did not receive specific training. These findings are in contrast with the findings of a Chinese study, which showed that the majority of medical staff in psychiatric hospitals received the specific training on 2019-nCoV epidemic (19). However, knowledge scores of our sample are extremely satisfactory. Indeed, 95.5% of our sample has an excellent knowledge about prodromal stages of illness.

According to KAB theory (14), knowledge scores are related to behavior scores. In fact, having attended a course on 2019-nCoV increases the probability of correctly recognizing the mode of transmission of the

virus, while having a low number of years of work experience, decreases the probability of responding correctly. However, The theoretical knowledge seemed to be more adequate than the behavior, as the nurses had to deal with an overcrowding of patients (9) and this may have conditioned the behavior responses on the correct management of suspected or ascertained cases. Several studies underline how excessive workloads result in an increased risk of making mistakes (20,21), especially procedural ones. In addition, multiple procedures of isolation and management, of infected subjects and the few hours for the knowledge on the main PPE in the degree courses may have influenced the correct behaviors for nursing care (7,22).

It could therefore be assumed that the search for information took place both personally and as a group (23). This generated better awareness, therefore attitude and proper behavior (24). The literature highlighted that at the beginning of the pandemic the team work to find the best knowledge was of fundamental importance to implement effective containment and management interventions (25). Moreover, our findings show that knowledge and behavior scores were related to educational background, age, or years of work experience in different way. Several studies showed the relation between socio-demographic characteristics and knowledge or behavior scores with heterogeneous results (26).

Conclusions

This study is the first one that evaluates knowledge and behavior, in a time of a full health emergency. However, behavior scores were evaluated only by self-reporting from online survey, which made it difficult to estimate the response rate. It would be appropriate to develop further studies to understand whether KAB theory can be used in its entirety, to better analyze the skills implemented to tackle 2019-nCoV disease. Further studies should be conducted to evaluate the consistency of KAB theory in a pandemic situation.

The 2019-nCoV pandemic has put on health personnel a considerable workload. Despite this, the Italian nursing staff has shown excellent knowledge and good behavior in the management of this pandemic.

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Correspondence:

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Noemi Giannetta, PhD

UniCamillus - Saint Camillus International University of Health and Medical Sciences

Via di Sant'Alessandro, 8

Roma, 00131 Italy

E-mail: noemigiannetta93@gmail.com