SANUS.2021;6:e242
DOI: https://doi.org/10.36789/revsanus.vi1.242
www.sanus.unison.mx

RESEARCH

Uncertainty about COVID-19 disease among nurses in hospitals in Morelia, Mexico

Incertidumbre ante la enfermedad COVID-19 en personal de enfermería de hospitales de Morelia, México

Incerteza sobre a doença COVID-19 em enfermeiras hospitalares em Morelia, México

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Received: 31/10/2020
Accepted: 13/11/2021

ISSN: 2448-6094
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Abstract

Introduction: The outbreak of emerging diseases such as COVID-19 has caused a series of alterations in people, including nurses, who are in the first line of care. Some of the effects include the presence of anxiety, depression, stress, insomnia, and anguish. **Objective**: Evaluate the level of uncertainty about COVID-19 disease in second-level nursing staff in Morelia, Michoacán, Mexico. **Methodology**: Descriptive and cross-sectional study, in a sample of 160 nurses from public and private second-level care hospitals, non-probabilistic convenience sampling contacted via Facebook. Nurses in direct patient care were included, using the modified community version of the Illness Uncertainty Scale and a sociodemographic and occupational data questionnaire. Descriptive statistics and chi-square were used. The anonymity of the participants was respected. **Results**. Most of the participants were women (87.5%), licensed nurses (63.1%), mean age 36.7 years (SD=8.5) and 36.9% had been in contact with COVID-19 patients. Total uncertainty was moderate in 56.9% and in nursing personnel in contact with COVID-19 patients it was 64.8%. A statistically significant relationship (p= ≤0.05) was found between uncertainty and sex, schooling; COVID-19 training and use of personal protective equipment; availability of face shield and personal protective equipment; have taken COVID-19 course and have had contact with COVID-19 patients. **Conclusions**. There was moderate uncertainty in the nursing personnel working at second-level care hospitals, with differences in personal variables, training and availability of material and equipment.

Keywords: Uncertainty; Nurses; Coronavirus infections; Patients; COVID-19 (DeCS).

Resumen

Introducción: La irrupción de enfermedades emergentes como la COVID-19 provoca una serie de alteraciones en las personas, incluyendo al personal de enfermería, quienes se encuentran en la primera línea de atención. Algunas afectaciones incluyen la presencia de ansiedad, depresión, estrés, insomnio y angustia. **Objetivo**: Evaluar el nivel de incertidumbre ante la enfermedad COVID-19 en personal de enfermería de segundo nivel de atención en Morelia, Michoacán, México. **Metodología**: Estudio descriptivo y transversal, en muestra de 160 enfermeras/os de hospitales públicos o privados de segundo nivel de atención, muestreo no probabilístico a conveniencia contactados vía Facebook. Se incluyeron enfermeras en atención directa a pacientes, utilizando Escala de Incertidumbre ante la Enfermedad en versión comunitaria modificada y cédula de datos sociodemográficos y laborales. Se empleó estadística descriptiva y chi cuadrada. Se respetó el anonimato de los participantes**. Resultados.** La mayoría de los participantes fueron mujeres (87.5%), licenciadas en enfermería (63.1%), edad promedio de 36.7 años (*DE*=8.5) y 36.9% habían tenido contacto con pacientes COVID-19. La incertidumbre total fue moderada en 56.9% y en personal de enfermería en contacto con pacientes COVID-19 fue 64.8%. Se encontró relación estadísticamente significativa (p= ≤0.05) entre incertidumbre y sexo, escolaridad; capacitación en COVID-19 y uso de equipo de protección personal; disponibilidad de careta y equipo de protección personal; tomar curso de COVID-19 y tener contacto con pacientes COVID-19. **Conclusiones.** Existió incertidumbre moderada en el personal de enfermería de hospitales de segundo nivel de atención, con diferencias en variables personales, de capacitación y disponibilidad de material y equipo.

Palabras clave: Incertidumbre; Enfermeras; Infecciones por coronavirus; Pacientes; COVID-19 (DeCS).

Abstrato

Introdução: A irrupção de doenças emergentes como a COVID-19 causa uma série de alterações nas pessoas, incluindo enfermeiras, que estão na primeira linha de atendimento. Alguns dos efeitos incluem a presença de ansiedade, depressão, estresse, insônia e angústia. **Objetivo**: Avaliar o nível de incerteza sobre a doença COVID-19 no pessoal de enfermagem de segundo nível em Morelia, Michoacán, México. **Metodologia**: Estudo descritivo e transversal, em uma amostra de 160 enfermeiros de hospitais públicos ou privados de segundo nível de assistência, amostra de conveniência não-probabilística contatados via Facebook. Foram incluídos enfermeiros no atendimento direto a pacientes, utilizando a versão modificada da Escala de Incerteza de Doença e um questionário de dados sociodemográficos e ocupacionais. Foram usadas estatísticas descritivas e o qui-quadrado. O anonimato dos participantes foi respeitado. **Resultados**. A maioria dos participantes eram mulheres (87,5%), enfermeiras licenciadas (63,1%), idade média de 36,7 anos (SD=8,5) e 36,9% tinham estado em contato com pacientes da COVID-19. A incerteza total foi moderada em 56,9% e no pessoal de enfermagem em contato com os pacientes da COVID-19 foi de 64,8%. Foi encontrada uma relação estatisticamente significativa (p=≤0,05) entre incerteza e sexo, escolaridade; treinamento COVID-19 e uso de equipamento de proteção pessoal; disponibilidade de máscara facial e equipamento de proteção pessoal; fazer o curso COVID-19 e ter contato com pacientes COVID-19. **Conclusões**. Houve incerteza moderada na equipe de enfermagem dos hospitais de segundo nível, com diferenças nas variáveis pessoais, treinamento e disponibilidade de material e equipamento.

Palavras-chave: Incerteza; enfermeira/o; infecções devido ao Coronavírus; pacientes (DeCS).

Introduction

COVID-19 disease caused by the new SARS-CoV-2 Coronavirus was considered a pandemic by the World Health Organization (WHO) on March 11, 2020 [(1)]. Nurses are on the first line of care for patients diagnosed with COVID-19, providing quality care that ensures patient safety [(2)]. To achieve this, health systems require the availability of sufficient nursing personnel, and during this pandemic, the lack of human resources in nursing in the world was demonstrated. Figures report the existence of 27.9 million nurses, with a ratio of 4.6 nurses per physician in European countries[(3)], while in Mexico there is an estimated rate of 2.5 nurses per 100,000 inhabitants, while in the State of Michoacán de Ocampo in Mexico, the rate of 1.7 nurses per 100,000 inhabitants is the lowest in the country [(4)]. These data are of great importance, given that the shortage of human resources in nursing contributes to increase the negative impact on the health of nurses with psychosocial factors such as stress, difficulty to sleep or waking up during the night [(5)], grief or dissatisfaction due to the loss of a patient[(6)]; in addition to occupational factors such as exposure to pathogens, stigma, and physical and psychological violence[(7)], which increased during the COVID-19 pandemic.

Although it is recognized that psychological stress and negative emotions experienced during an epidemic are expected; there are numerous general and specific stressors that nurses face in health crises that cause them uncertainty. Specific stressors are considered to be the risk of infecting oneself, family or others, or the misinterpretation of flu symptoms with COVID-19 [8-9]; as well as the fear of dying or social isolation due to the association with the disease [10].

There are also institutional stressors such as the stigmatization of working with patients with COVID-19, discomfort with the use of Personal Protective Equipment (PPE), insufficient PPE training or shortage of PPE, inexperience or few nurses, and the perception of limited support from health authorities during the pandemic [8-14]. In addition, nurses may experience frustration at the often inevitable death of patients or even be at risk of burnout and compassion fatigue from the patients they care for in Intensive Care Units (ICUs) [9-10, 15-17].

Therefore, there are multiple elements during the pandemic that cause nurses psychological stress, decreased appetite, fatigue, difficulty sleeping, nervousness, frequent crying[8-9] and even suicidal thoughts in addition to uncertainty when they are directly caring COVID-19 patients because they feel isolated and vulnerable to infection [18-23].

Uncertainty, according to Merle Mishel's theory, is defined as the inability to determine the meaning of the facts related to the disease, and during the COVID-19 pandemic, nurses face unknown work, family and personal situations resulting from the pandemic that prevent them from determining the outcome for their lives[24]. Therefore, it is important to investigate the uncertainty variable from Michel's theoretical underpinning to create empirical evidence that strengthens the nursing discipline. Unfortunately, no studies on this subject were found, so the objective was to evaluate the level of uncertainty in the COVID-19 disease among nursing personnel in second-level care hospitals in Morelia, Michoacán, Mexico.

Methodology

Descriptive and cross-sectional study [25] performed in a non-probabilistic sample of 160 nurses selected at

convenience, who were asked to participate in the Facebook groups of the researchers of the study. Nurses working in public or private second-level care hospitals in Morelia, Michoacán, Mexico, male and female, aged 18 to 50 years, in direct care of patients with COVID-19, or any disease, were included; nurses on sick leave or performing administrative activities were excluded.

A two-part data collection questionnaire was applied. The first section presented questions to describe the population with sociodemographic variables such as age, sex, schooling, institution, shift, training received (hand washing, general information on COVID-19 and use of PPE) and available protective material and equipment (paper towels, masks, hand sanitizer, face shield and PPE). The second section included variables such as COVID-19 disease online course, contact with COVID-19 patients and reconversion to COVID-19 hospital.

The Uncertainty of Illness Scale in Community Version (MUIS-C) [26], consisting of 23 items, uses a Likert type scale ranging from 1 to 5, where 5 = completely agree, and 1 = do not agree at all. All items are added and the score obtained is classified as low uncertainty (18 to 42 points), moderate uncertainty (43 to 66 points), and high uncertainty (67 to 90 points). The scale was modified to target nurses with emphasis on COVID-19 disease, and a content validation was performed by ten instrument experts. The final modified version consists of 18 items and was applied to nurses from a different private hospital, obtaining an internal consistency with Cronbach's alpha test of 0.863.

Study approved by the Research and Bioethics Committee of the Nursing School (CIB/FacEnf/017/2020). Data collection was performed on a Google form published on the researchers' Facebook social network during the month of June 2020, indicating the selection criteria necessary to participate, emphasizing that the research was risk-free and free of charge, data handling was confidential, withdrawal is possible since no question was mandatory, and express consent was requested [27]. The statistical analysis was performed with descriptive statistics using frequencies, proportions, measures of central tendency and dispersion. The inferential analysis was through Pearson's Chi-square test defining a significance level of $p=<0.05$.

Results

The participants had a mean age of 36.7 years (SD=8.5) and were mostly women (87.5%); had a nursing degree (63.1%); belonged to the Ministry of Health: and worked the morning shift (37.5%) (Table 1).

Table 1. Nurses sociodemographic profile working in second-level care hospitals, in Morelia, Michoacán, Mexico, 2020(n= 160).

Variable		*f*	%
Gender	Female	140	87.5
	Male	20	12.5
Schooling	Technical level	27	16.9
	Bachelor's Degree	101	63.1
	Postgraduate	32	20
Institution	Ministry of Health	108	67.5
	IMSS	24	15.0
	ISSSTE	10	6.3
	Private Hospital	18	11.3
Shift	Morning	60	37.5
	Evening	31	19.4
	Night	44	27.5
	Accumulated workday	25	15.6

Source: Own development
IMSS= Mexican Institute of Social Security (Instituto Mexicano del Seguro Social); ISSSTE= Government Workers' Social Security and Services Institute (ISSSTE) (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado).

Regarding training, 73.1% of the participants attended sessions regarding hand washing, 75% attended sessions regarding general information about COVID-19, and 50.6% did not receive training in the use of PPE. The nurses had materials such as paper towels (72.5%), masks (84.4%), hand sanitizer (68.8%), field shields (60%) and 71.9% did not have access to PPE for the direct care of people with COVID-19. It is noteworthy that 62.5% of the participants did not receive online courses about how to handle COVID-19, only 36.9% of the nurses had contact with COVID-19 patients and 33.8% of the hospitals were reconverted to COVID-19 hospital (Table 2).

Table 2. Work variables of nurses in second level care hospitals, Morelia, Michoacán, Mexico, 2020 (n= 160).

Variables	*f*	%

Training			
Hand washing	Yes	117	73.1
	No	43	26.9
COVID-19 general Information	Yes	120	75
	No	40	25
PPE use	Yes	79	49.4
	No	81	50.6
Availability of material and equipment			
Paper towels	Yes	116	72.5
	No	44	27.5
Masks	Yes	135	84.4
	No	25	15.6
Hand sanitizer	Yes	110	68.8
	No	50	31.3
Face shield	Yes	96	60
	No	64	40
PPE	Yes	45	28.1
	No	115	71.9
COVID-19 Variables			
COVID-19 online disease course	Yes	60	37.2
	No	100	62.5
COVID-19 Patient Contact	Yes	59	36.9
	No	101	63.1
COVID-19 Hospital Conversion	Yes	54	33.8
	No	106	66.3

Source: Own elaboration

In this sample, 64.4% of the participants showed moderate to high uncertainty and only 35.6% showed low uncertainty (Table 3).

Table 3. Uncertainty in nurses in second-level care hospitals, Morelia, Michoacán, Mexico, 2020 (n= 160).

Uncertainty	*f*	%
Low	57	35.6
Medium	91	56.9
High	12	7.5

Source: Own elaboration

When the relationship of uncertainty with sociodemographic and work variables was analyzed, a statistically significant relationship (p=≤0.005) was found between uncertainty and sociodemographic variables (sex and schooling), in training (COVID-19 disease generalities and use of PPE), in availability of material (masks and PPE) and in COVID-19 variables (COVID-19 online course) (Table 4).

Discussion

Regarding sociodemographic variables, the participants in this study have similar characteristics to other studies performed in China that addressed factors associated with the mental health of personnel exposed to COVID-19 and stress in nursing personnel, which include being mostly women and with a bachelor's degree in nursing [18-19]. The nurses in direct patient care in this study reported having access to paper towels for hand washing and hand sanitizer, but not to PPE. This situation has been frequently highlighted by nursing organizations and recent research, where it is mentioned that nursing personnel have limited access to PPE even in developed countries[12-13], which increases the risk of exposure to the virus and the possibility of being infected with the disease, which can lead to an increase in the level of uncertainty that nurses may experience during their work[13, 21-23].

Table 4. Relationship between uncertainty and work variables in second-level care hospitals, Morelia, Michoacán, Mexico, 2020(n= 160).

Variable		Uncertainty						*p*
		low		Medium		High		
		f	%	*f*	%	*f*	%	
Sociodemographics								
Gender	Female	49	35	83	59.3	8	5.7	.049**
	Male	8	40	8	40	4	20	
Schooling	Technical level	17	63	9	33.3	1	3.7	.014**
	Bachelor's Degree	31	30.7	60	59.4	10	9.9	
	Postgraduate	6	18.8	26	81.3	0	0	
Training								
Hand washing	Yes	38	32.5	71	60.7	8	6.8	.276
	No	19	44.2	20	46.5	4	9.3	
COVID-19 General Information	Yes	28	27.5	65	63.7	9	8.8	.016**
	No	31	51.7	25	41.7	4	6.7	
PPE use	Yes	19	24.1	52	65.8	8	10.1	.009**
	No	38	46.9	39	48.1	4	4.9	
Availability of material								
Face shield	Yes	26	27.1	62	64.6	8	8.3	.022**
	No	31	48.4	29	45.3	4	6.3	

PPE	Yes	9	20	31	68.9	5	11.1	.031**
	No	48	41.7	60	52.2	7	6.1	
COVID-19 Variables								
COVID-19 online disease course	Yes	13	21.7	43	71.7	4	6.7	.011**
	No	44	44	48	48	8	8	
COVID-19 Patient Contact	Yes	13	24.1	35	64.8	6	11.1	.068
	No	44	24.1	56	52.8	6	5.7	
COVID-19 Hospital Conversion	Yes	15	25.4	40	67.8	4	6.8	.093
	No	42	41.6	51	50.5	8	7.9	

Source: Own development.
**$p = \leq 0.005$

Nurses received training in the institution where they worked in topics such as hand washing and general statements regarding COVID-19, but not in the use of PPE; in this respect, training is essential for nurses when they are faced with emerging diseases such as that caused by the SARS-CoV-2 Coronavirus, where information is generated on a daily basis. This is especially important because PPE training is essential to ensure nurses' safety; when this does not occur, nurses feel threatened by the possibility of becoming infected when the PPE is removed and this can be a factor for the presence of uncertainty [10, 13, 20-21, 24, 28-29].

Nurses mostly did not take courses on COVID-19 available in platforms of the Mexican Health System. Although there are successful experiences in nurses focused on training with zero infection rates[20], this is not common. So, health institutions should ensure necessary, recent and evidence-based training. Mishel points out in his theory that training and credibility in the health system authorities (sources of structure) reduce uncertainty [24], suggesting also the need to strengthen the mindset of the nursing personnel, that is, the subjective interpretation they make regarding the disease in order to strengthen the stimuli framework [26, 28].

Regarding the level of uncertainty, more than half of the nurses showed moderate to high uncertainty, which confirms what has been pointed out in several studies with Mishel's theoretical reference, where the stimuli framework perceived by the nursing personnel through personal, work or institutional stressors [8-13] which have a negative effect producing uncertainty in the person [24, 29].

It was also seen that lower uncertainty was related in this study to having a higher academic degree,

receiving training on the disease, the use of PPE and personal training with online courses regarding COVID-19, since practical theoretical knowledge allows nurses to recognize their areas of improvement and identify processes that increase the risk of infection such as the placement and removal of PPE[8-9].

This confirms that sources of structure such as education or training will support the reduction of uncertainty in the nursing personnel [24, 26]. As can be seen, there are several factors that cause uncertainty in nurses who are in direct care of people with COVID-19 and require that managers and organizations of health systems take measures to mitigate mental health side effects in nurses, one of them is to provide psychological care to personnel who are on the first line of Covid-19 treatment.

Conclusions

Given that the objective of the study was to evaluate the level of uncertainty about COVID-19 in second level nursing personnel in Morelia, Michoacán, Mexico, a moderate to high level of uncertainty was identified, it was higher in women and in nurses with undergraduate and graduate schooling; Uncertainty was also higher when nurses received training regarding COVID-19 information and the use of PPE, with availability of face shields and PPE, and, finally, when nurses participated in COVID-19 online courses.

A limitation of this study was that only slightly more than one third of the nurses were in contact with patients with COVID-19, so no statistically significant relationship was found between uncertainty and maintaining contact with COVID-19 and conversion to COVID-19 hospital. Other limitations to note are the use of a non-probabilistic sample and a cross-sectional design that does not consider the changes that nurses may experience throughout the pandemic. This study allowed an approach to the reality experienced by nurses in Mexico while caring for the population during the COVID-19 pandemic, so it is expected that the results will allow nursing managers in Mexico to propose personalized interventions to improve the mental health of their personnel, especially in situations of uncertainty that they are experiencing on a daily basis.

Conflict of interests

The authors stated they have no conflicts of interests.

Funding

This research did not receive any funding.

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How to cite this article: Ruiz-Recéndiz M, Jiménez-Arroyo V, Huerta-Baltazar M, Alcántar-Zavala M, Herrera-Paredes J, González-Villegas G. Uncertainty about COVID-19 disease among nurses in hospitals in Morelia, Mexico. SANUS [Internet]. 2021 [citado ddmmaa];6:e242. Available at: URL/DOI.