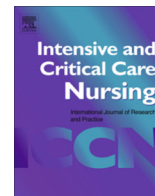




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Research article

Nurses' perceptions and demands regarding COVID-19 care delivery in critical care units and hospital emergency services



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ABSTRACT

Background: The COVID-19 pandemic is a public health challenge that puts health systems in a highly vulnerable situation. Nurses in critical care units (CCUs) and hospital emergency services (HESs) have provided care to patients with COVID-19 under pressure and uncertainty.

Objective: To identify needs related to safety, organisation, decision-making, communication and psycho-socio-emotional needs perceived by critical care and emergency nurses in the region of Madrid, Spain, during the acute phase of the epidemic crisis.

Methods: This is a cross-sectional study (the first phase of a mixed methods study) with critical care and emergency nurses from 26 public hospitals in Madrid using an online questionnaire.

Results: The response rate was 557, with 37.5% reporting working with the fear of becoming infected and its consequences, 28.2% reported elevated workloads, high patient-nurse ratios and shifts that did not allow them to disconnect or rest, while taking on more responsibilities when managing patients with COVID-19 (23.9%). They also reported deficiencies in communication with middle management (21.2%), inability to provide psycho-social care to patients and families and being emotionally exhausted (53.5%), with difficulty in venting emotions (44.9%).

Conclusions: Critical care and emergency nurses may be categorised as a vulnerable population. It is thus necessary to delve deeper into further aspects of their experiences of the pandemic.

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Implications for clinical practice

- There is a need to ensure a nurse-to-patient ratio that takes into consideration the complexity of caring for patients with COVID-19 in critical care units, as well as the recognition of advanced nursing roles which imply taking on emerging clinical competencies.
- Measures such as condensing care interventions into maximum exposure periods of four hours, facilitating breaks for basic needs and venting emotions may contribute to improving the physical and emotional wellbeing of nurses.
- It is crucial to provide nurses with sufficient protective equipment, a minimum level of training and clinical practice guidelines with clear and precise instructions.
- Interventions aimed at providing psycho-emotional support to nurses should be maintained in the medium term.
- Communication between frontline nurses and mid-level care managers is key to ensuring efficient care management in times of crisis.

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Introduction

On January 30, 2020, the Director-General of the World Health Organization (WHO) declared the outbreak of the novel coronavirus 2019 (COVID-19), in the People's Republic of China, a Public Health Emergency of International Concern (PHEIC) (Ministerio de Sanidad, Consumo y Bienestar Social [Spanish Ministry of Health, Consumer Affairs, and Social Welfare], 2020a). The spread and seriousness of this infection led the WHO to declare COVID-19 a pandemic on March 11, 2020 (WHO, 2020). In Europe, the rapid spread of the virus in some countries led governments to declare a state of emergency, imposing total or partial lockdown restrictions for their population, the partial closure of borders and cessation of productive and educational activities as essential measures (CIDOB, 2020).

As of May 26, 2020, the number of reported cases in Europe was 1361100 with Spain being the third most affected country (European Centre for Disease Prevention and Control, 2020), with 236259 confirmed cases and 27117 deaths (Ministerio de Sanidad, Consumo y Bienestar Social [Spanish Ministry of Health, Consumer Affairs, and Social Welfare], 2020b). The region of Madrid was the most affected in Spain, with a total of 68066 cases. Of these, it is estimated that 41913 required hospitalisation, with 3538 individuals admitted to Critical Care Units (CCUs) (Ministerio de Sanidad, Consumo y Bienestar Social [Spanish Ministry of Health, Consumer Affairs, and Social Welfare], 2020b). Intensive care units (ICU) saw an increase of up to 300% in the number of critical care patients in hospitals, which posed an unprecedented challenge in terms of healthcare delivery and logistics (Ferrer, 2020). Caring for people affected by COVID-19 has put intense pressure on nursing care (Catton, 2020), especially in the CCU, where, in order to meet this demand, it was necessary to rearrange nurses' shifts, recruit nurses who were working in other services, reinstate retired professionals or hire temporary staff (Lucchini et al., 2020; Jackson et al., 2020; Raurell-Torredà, 2020).

Background

CCU nurses have had to manage the risk of contagion, occasionally with insufficient protective measures (Iserson, 2020) and provide regular care using personal protective equipment (PPE). In addition, they have had to familiarise themselves with new and changing diagnostic protocols and pharmacological treatments and have witnessed patients dying alone due to strict isolation measures. Hospital Emergency Services (HES) have been under high pressure to provide care during the most critical moments of the pandemic (Comelli et al., 2020; Estalella et al., 2020) with nurses caring for patients with uncertain serological status and severe symptoms under continuously updated triage and referral criteria.

Studies in countries that had previously had a high incidence of Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) or Ebola, identified the way that the experience of care affected professionals (Chang et al., 2006; Chen et al., 2006; Kim, 2018; Liu and Liehr, 2009). The nurses' levels of anxiety, depression and lack of sleep only decreased from the second week of the outbreak of the crisis onwards, with the implementation of isolation measures, clear instructions and procedures and sufficient and good quality PPE (Chen et al., 2006). Commitment to the profession and remaining in it after the epidemic were found to be related to their perception of high risk of contagion (Chang et al., 2006). Positive aspects were also highlighted, such as greater professional growth (Kim, 2018) and an awareness of the need to prepare for future crises (Lam et al., 2019; Liu and Liehr, 2009).

In the current pandemic, both CCU and HES nurses have been delivering care in highly stressful environments and under high

pressure to provide care. Exploring their experiences seems to be key to establishing action plans in order to ensure the sustainability of care management.

The aim of this study is to identify the safety, organizational, decision-making, communication, and psycho-socio-emotional needs perceived by the CCU and HES nurses in the region of Madrid during the acute phase of the COVID-19 crisis in Spain.

Methods

A quantitative-qualitative mixed methods sequential research design (Bergman, 2008; Creswell and Plano Clark, 2011; Morse and Miehau, 2009) was used, consisting of two phases: (1) a cross-sectional study using an online questionnaire with closed questions and (2) a qualitative phenomenological study using in-depth interviews. The present article focuses on phase 1.

The study was conducted in 26 public hospitals in the region of Madrid, classified as: high complexity hospitals (HCHs), intermediate complexity hospitals (ICHs) and low complexity hospitals (LCHs). All nurses caring for patients with COVID-19 and patients suspected to have COVID-19 in CCUs and HESs who voluntarily agreed to participate were considered to be the study population. The following were excluded: nursing professionals delivering care in medium-stay hospitals, highly specialised hospitals, or auxiliary hospitals in the public hospital network in the Madrid region; nursing professionals providing care in inpatient care units.

A non-probabilistic sampling method was used taking accessibility to participants as a criterion, as there was no official register of the total number of nurses caring for patients in CCUs and HESs during the crisis. The sample was reached by contacting staff in the middle level of care management (CCU and HES supervisors), associate professors and clinical collaborators who participate in the follow-up of students during their clinical placements, and the professional and personal networks of the members of the research team. This was done by emailing and mass text messaging.

For data collection, we used a questionnaire developed by the research team using as references the SARS Team Questionnaire (Lee et al., 2005), the Practice Environment Scale of the Nursing Work Index (PES-NWI) (de Pedro-Gómez et al., 2009), the Medical Office Survey on Patient Safety Culture (MOSPSC) (Torijano-Casalengua et al., 2013) and the Granada Burnout Questionnaire applied to nurses (de la Fuente et al., 2015), including socio-demographic, occupational and academic variables. Our questionnaire consists of 31 items rated with a four-point Likert scale, and measures the following dimensions: safety (10 items); organisation (6 items); decision making (4 items); communication and relationships between the members of the team (5 items) and psycho-socio-emotional needs (6 items). The questionnaire was edited and distributed using the SurveyMonkey platform, could be accessed through a link and a Quick Response (QR) code, and was accompanied by a letter of invitation to participate. Data were collected between April 1 and 15, 2020 (the peak period of the pandemic in Spain) (Fig. 1).

A descriptive analysis of the data was performed by measuring absolute and relative frequencies for all variables. Differences in proportions were tested using Student's *t*-tests. Analyses were performed at 95% confidence levels ($p \leq 0.05$) using the Stata 12 program.

The present study was approved by the Research Ethics Committee of the Autonomous University of Madrid under file number CEI-106-2063. The questionnaire was created using the SurveyMonkey platform in order to preserve the anonymity of the respondents, who were informed about the objectives of this study and invited to participate in it by means of a cover letter.

Results

A total of 622 questionnaires were returned, of which 65 (12.5%) were eliminated for not meeting the inclusion criteria. The variable “current work unit” was missing from 32 questionnaires. The decision was made not to exclude these questionnaires. As a result, 557 questionnaires were finally analysed in this study.

Of the total number of participants, 87.4% were women, 69.1% were between 26 and 45 years old and 50.2% had more than 10 years professional experience. Seventy-four percent of the nurses held a bachelor’s degree, while 24.8% held a postgraduate degree (specialty, Master’s or a Ph.D.). With respect to the COVID-19 patient care unit, 38.2% of the sample delivered care in HESs, while 56% did so in CCUs. Of the latter group, 35.3% had been working in the CCU for less than a month (10.3% of them for less than a week). Almost 50% of the nurses reported having dependents. In both units, only 11.7% had received training in the care of patients with COVID-19 compared to 87.6% who had not (Table 1). All hospitals reported participation, which was distributed as follows by level of complexity: 55.6% for HCHs, 34.8% for ICHs and 6.2% for LCHs.

With respect to the questionnaire scores, the variables of great interest are described by dimension. In the safety dimension, 37.5% of the nurses always think about the possibility of becoming infected by COVID-19 over the course of their healthcare practice; 62.8% reported that they are always afraid of infecting the people with whom they live and 46.5% always think about the possibility of being an asymptomatic carrier. In the organisational dimension, about one third felt that there was not enough nursing staff (28.2%) or other non-healthcare support staff (31.1%) to properly carry out the work. In addition, 33.6% considered it to be the case that the healthcare centre never provided enough fluid and food to cover the needs caused by physical exhaustion during the work shifts. With regard to decision making, 23.9% stated that they had to exercise a greater degree of autonomy in the clinical management of patients with COVID-19 than in their usual practice. When asked about the communication and relationship aspects between the members of the healthcare team, 21.1% mentioned that middle and senior managers never enquired about the needs of the healthcare team and 53.5% considered that it was not possible to meet

the psycho-emotional needs of the family members of patients with COVID-19. Additionally, 44.9% reported that they always felt emotionally exhausted at the end of the working day, and 26.8% acknowledged that they never fall asleep easily or have a good nights sleep (Table 2).

In analyzing the relationships between the responses and each of the socio-demographic, occupational, and academic variables, significant differences ($p < 0.05$) were observed for the following variables:

Regarding the academic level, differentiating between basic (undergraduate) and advanced (postgraduate) training, it was found in the safety dimension that nurses with advanced training were less afraid of making mistakes and perceived a lesser lack of knowledge. They also considered themselves to have been asked to participate in tasks for which they had not been trained, and reported having fewer problems in relation to rest and sleep. Regarding communication, nurses with basic training more often considered there to be good working relationships between physicians and nurses (Table 3).

As for professional experience, nurses with fewer than ten years of experience think about the possibilities of making mistakes while caring for patients with COVID-19 and of becoming infected and infecting people they live with more frequently. Also, they tended to consider themselves more often to have had to exercise more autonomy in the clinical and pharmacological management of patients than they usually do, and, furthermore, they considered themselves to have taken on decisions made by other professionals which caused them moral suffering. However, they acknowledged more frequently both making use of humor or distractions to cope with the emotional burden, as well as having the possibility of venting emotions with supportive people, even though they have more trouble sleeping. In the case of more experienced nurses, their perception of having protective material that ensures their safety when caring for patients with COVID-19 is significant (Table 3).

Finally, considering the differences based on the work unit (CCU or HES), in the safety dimension, CCU nurses felt that protective equipment was available and that they were more often asked to perform tasks for which they had not been trained. In organizational matters, the patient-nurse ratio was considered to be excessive or very excessive more often in CCUs than in HESs. In addition,

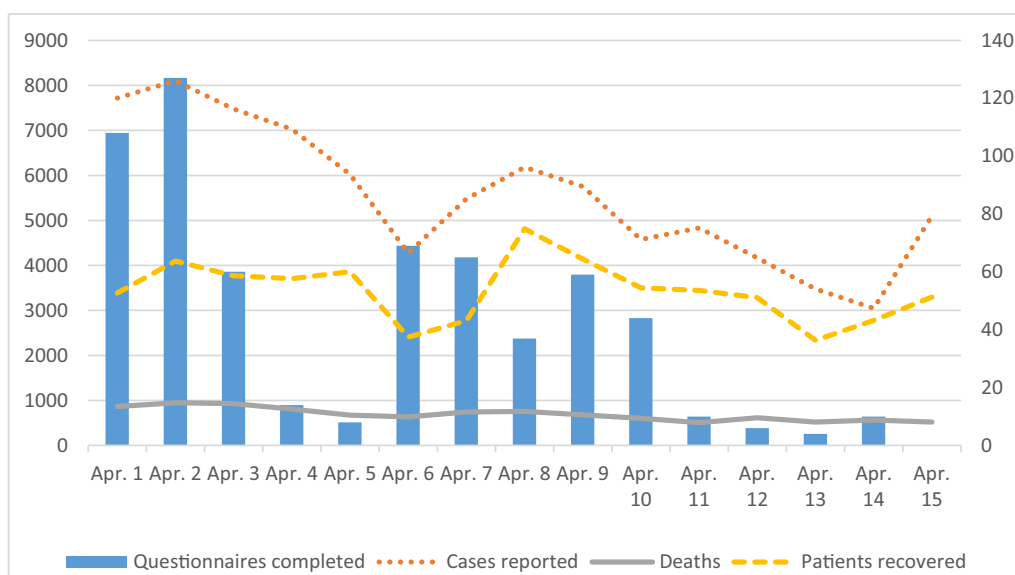


Fig. 1. Description of the data collection period (COVID-19 cases reported, deaths, and patients recovered in Spain) and questionnaires completed. Source of epidemiological data: Spanish Ministry of Health, Consumer Affairs, and Social Welfare.

Table 1
 Socio-demographic, occupational, and academic characteristics of the participating nurses.

	Total 557 (%)	HES nurses 213 (38.2%)	CCU nurses 312 (56%)	Missing 32 (5.8%)	p
Age (years)					0.315
<25	82 (14.7)	30 (14.1)	46 (14.7)	6 (18.8)	
26–35	210 (37.7)	84 (39.4)	117 (37.5)	9 (28.1)	
36–45	175 (31.4)	74 (34.7)	92 (29.5)	9 (28.1)	
46–55	67 (12)	19 (8.9)	44 (14.1)	4 (12.5)	
>55	20 (3.6)	6 (2.8)	13 (4.2)	1 (3.1)	
Missing	3 (0.5)	–	–	3 (9.4)	
Sex					0.997
Female	487 (87.4)	187 (87.8)	273 (87.5)	27 (84.4)	
Male	66 (11.9)	26 (12.2)	38 (12.2)	2 (6.3)	
Missing	4 (0.7)	–	1 (0.3)	3 (9.4)	
Academic level					0.654
Degree in Nursing	412 (74)	159 (74.7)	234 (75)	19 (59.4)	
Specialist	37 (6.7)	17 (8)	17 (5.5)	3 (9.4)	
Master's Degree	91 (16.3)	33 (15.5)	53 (17)	5 (15.6)	
Ph.D. (Doctor)	10 (1.8)	3 (1.4)	6 (1.9)	1 (3.1)	
Missing	7 (1.3)	1 (0.5)	2 (0.64)	4 (12.5)	
Usual work unit					0.000
HES	169 (30.3)	162 (76.1)	7 (2.2)	–	
CCU	205 (36.8)	–	205 (65.7)	–	
Inpatient Care	71 (12.8)	28 (13.2)	20 (6.4)	23 (71.9)	
Other	108 (19.4)	23 (10.8)	80 (25.6)	5 (15.6)	
Missing	4 (0.7)	–	–	4 (12.5)	
Professional experience (years)					0.247
<1	50 (9)	13 (6.1)	34 (10.9)	3 (9.4)	
1–5	142 (25.5)	53 (24.9)	79 (25.3)	10 (31.3)	
6–10	77 (13.8)	36 (16.9)	39 (12.5)	2 (6.3)	
11–15	84 (15.1)	36 (16.9)	46 (14.7)	2 (6.3)	
>15	201 (35.1)	75 (35.2)	114 (36.5)	12 (37.5)	
Missing	3 (0.5)	–	–	3 (9.4)	
Time working in the current unit					0.000
<1 week	49 (8.8)	14 (6.6)	32 (10.3)	3 (9.4)	
1 week-1 month	107 (19.2)	21 (9.9)	78 (25)	8 (25)	
1–2 months	40 (7.2)	15 (7.1)	24 (7.7)	1 (3.1)	
2 months-1 year	63 (11.3)	29 (13.7)	31 (9.9)	3 (9.4)	
>1 year	293 (52.6)	133 (62.4)	147 (47.1)	13 (40.6)	
Missing	5 (0.9)	1 (0.5)	–	4 (12.5)	
Previous training in the care of patients with COVID-19					0.566
Yes	65 (11.7)	23 (10.8)	39 (12.5)	3 (9.4)	
No	488 (87.6)	189 (88.7)	273 (87.5)	26 (81.3)	
Missing	4 (0.7)	1 (0.5)	–	3 (9.4)	
Dependents (grandparents, parents and/or offspring)					0.507
Yes	260 (46.7)	98 (46)	154 (49.4)	8 (25)	
No	297 (53.3)	115 (54)	158 (50.6)	24 (75)	

organisational problems were more frequently identified in CCUs. With respect to decision making, CCU nurses more frequently exercise greater autonomy in the administration of drugs for and in the clinical management of patients with COVID-19. Furthermore, CCU nurses had a greater perception of teamwork and considered there to be better working relationships between physicians and nurses (Table 3).

Discussion

The average profile of the nurses who provided support in the participatory CCUs and HESs of this study during the outbreak is that of a nurse in a phase of professional maturity, with more than 10 years of clinical experience, basic training and dependents in half of the cases. CCU nurses worked in units with large staff changes where recruitment or relocation of staff to support the increase in demand for care is close to 10%. Eighty-seven percent of the respondents were female, in line with other studies (Wenham et al., 2020) which indicate that 90% of the workforce during this crisis was female.

Participants report a subjective perception of lack of safety in relation to the possibility of becoming infected with COVID-19 and of being asymptomatic carriers, thus posing a risk of contagion to their work and family environments. This may be related to the

lack of PPE, the lack of knowledge of this novel coronavirus, and the lack of well-defined protocols for managing patients infected with SARS-CoV-2. Kim (2018) identified this same feeling of fear and lack of safety among the nurses in her study regarding MERS, who mentioned, as the main causal factors, the changes in infection control protocols, their lack of knowledge of the disease, and becoming aware of their own vulnerability.

In terms of organisation, there is a noticeable imbalance between workloads and human resources. This may be related to the increased workload involved in the care of patients with COVID-19. Lucchini et al. (2020) report a 33% increase in CCU workload, with mean scores of 84 on the Nursing Activities Score (NAS), well above the normal value of 63, due to the high number of patients dependent on mechanical ventilation, indications for prone positioning, time spent putting on and taking off PPE and indications for extracorporeal life support techniques. Lucchini et al. (2020) also report on the need to ensure nurse-patient ratios of 1:1.5. In addition, the Spanish Society of Intensive Nursing and Coronary Units (SEIUC) recommends a ratio of 1:2 (the usual average nurse-patient ratio prior to the COVID-19 pandemic was 1:2.5) (Cruz-Lendínez et al., 2019), with one expert nurse for every 4–6 beds to provide support at times of peak workload and points out that a NAS greater than 61 increases the risk of patient mortality (Raurell-Torredà et al., 2020).

Table 2
Assessment of the questionnaire's closed questions.

	Lowest level of agreement Never	Sometimes	Most of the time	Highest level of agreement Always	Missing
	n (%)	n (%)	n (%)	n (%)	n (%)
SAFETY					
I have equipment to ensure that I am safe when caring for patients infected with COVID-19.	9 (1.6)	180 (32.3)	280 (50.3)	86 (15.4)	2 (0.4)
Asepsis measures are followed to prevent spreading the virus within the healthcare setting.	31 (5.6)	205 (36.8)	256 (46)	62 (11.1)	3 (0.5)
I am afraid of making mistakes in the care of patients infected with COVID-19 due to the pressure on care.	13 (2.3)	242 (43.5)	169 (30.3)	130 (23.3)	3 (0.5)
I feel that I lack sufficient knowledge on the care of patients infected with COVID-19.	22 (4)	315 (56.6)	137 (24.6)	80 (14.4)	3 (0.5)
The center ensures that it trains staff in the procedures and how to use protective equipment.	109 (19.6)	282 (50.6)	121 (21.7)	42 (7.5)	3 (0.5)
Patient care protocols for patients infected with COVID-19 are well defined.	137 (24.6)	303 (54.4)	96 (17.2)	19 (3.4)	2 (0.4)
Healthcare workers are asked to perform tasks for which they have not been trained.	48 (8.6)	294 (52.8)	141 (25.3)	71 (12.8)	3 (0.5)
I think about the possibility of becoming infected with COVID-19 while carrying out my healthcare duties.	14 (2.5)	176 (31.6)	154 (27.6)	209 (37.5)	4 (0.7)
I think about the possibility of being a probable asymptomatic carrier.	6 (1.1)	133 (23.9)	157 (28.2)	259 (46.5)	2 (0.4)
I am afraid of infecting the people I live with/I have contact with.	6 (1.1)	78 (14)	122 (21.9)	350 (62.8)	1 (0.2)
ORGANISATION					
Nursing staffing levels are sufficient to be able to do the job properly.	157 (28.2)	230 (41.3)	150 (26.9)	19 (3.4)	1 (0.2)
Non-healthcare staffing levels are sufficient to do the job properly.	173 (31.1)	253 (45.4)	111 (19.9)	18 (3.2)	2 (0.4)
How do you view the patient-nurse ratio? (Highly appropriate – Highly excessive).	145 (26)	278 (49.9)	126 (22.6)	6 (1.1)	2 (0.4)
There are problems in the organization and distribution of work.	22 (4)	303 (54.4)	154 (27.8)	76 (13.6)	1 (0.2)
There is sufficient time for rest and switching off between shifts.	166 (29.8)	275 (49.4)	100 (18.1)	13 (2.3)	2 (0.4)
The hospital provides fluids and food to prevent physical exhaustion during shifts.	187 (33.6)	210 (37.7)	113 (20.3)	45 (8.1)	2 (0.4)
DECISION MAKING					
I participated actively in the decision-making process regarding the reorganization of care activities.	148 (26.6)	243 (43.6)	120 (21.5)	43 (7.7)	3 (0.5)
I feel that I had to exercise a greater degree of autonomy in the administration of drugs compared to in usual practice.	91 (16.3)	227 (40.8)	147 (26.4)	89 (16)	3 (0.5)
I feel that I had to exercise a greater degree of autonomy in the clinical management of COVID-19 patients compared to in usual practice.	26 (4.7)	217 (39)	180 (32.3)	133 (23.9)	1 (0.2)
I feel that I had to take on decisions made by other professionals that have caused me moral suffering.	116 (20.8)	321 (57.6)	79 (14.3)	40 (7.2)	0
COMMUNICATION AND RELATIONSHIPS BETWEEN TEAM MEMBERS					
There is a lot of teamwork between physicians and nurses.	51 (9.2)	260 (46.7)	188 (33.8)	58 (10.4)	0
There are good working relationships between physicians and nurses.	9 (1.6)	200 (35.9)	286 (51.7)	59 (10.6)	1 (0.2)
Middle and senior managers are open to proposals for improvement from the healthcare team.	87 (15.6)	276 (49.6)	147 (26.4)	47 (8.4)	0
Middle and senior managers inquire about the needs of the healthcare team.	123 (22.1)	277 (49.7)	124 (22.3)	32 (5.8)	1 (0.2)
Middle and senior managers try to meet the needs of the healthcare team.	73 (13.1)	295 (53)	153 (27.5)	35 (6.3)	1 (0.2)
PSYCHO-SOCIO-EMOTIONAL NEEDS					
It is possible to attend to the psycho-emotional needs of patients infected with COVID-19.	195 (35)	293 (52.6)	44 (8)	22 (4)	3 (0.5)
It is possible to attend to the psycho-emotional needs of the families of patients infected with COVID-19.	298 (53.5)	221 (39.7)	26 (4.7)	7 (1.3)	5 (0.9)
Humor and other distraction strategies are used by the healthcare team to help team members cope with the emotional burden.	33 (5.9)	215 (38.6)	221 (39.7)	87 (15.6)	1 (0.2)
I feel emotionally exhausted at the end of the working day.	3 (0.5)	105 (18.9)	197 (35.4)	250 (44.9)	2 (0.4)
I have the possibility of venting my emotions by sharing them with people who support me.	85 (15.3)	187 (33.6)	184 (33)	97 (17.4)	4 (0.7)
I can fall asleep easily and have a good night's sleep.	149 (26.8)	284 (51)	94 (16.9)	29 (5.2)	1 (0.2)

Furthermore, most nurses pointed out that the way their work was organised did not allow them to rest and disconnect between shifts, leaving them feeling emotionally exhausted and unable to fall asleep easily or have a good night's sleep. Previous studies report ICU management experiences aimed at ensuring that there are good handover and rest periods with special shifts and task distribution. Concentrating care interventions with maximum exposure periods of four hours, facilitating breaks for basic needs and venting of emotions and overlapping shifts for one hour are encouraged (Huang et al., 2020; Raurell-Torredà, 2020).

With regard to communication, most nurses perceived that managers did not take into account their voice, were not open to their proposals and failed to meet their needs. This lack of communica-

tion may be linked to the sense of moral suffering that they report in relation to taking on non-consensual decisions (Cacchione, 2020). According to Jun et al. (2020), teamwork and group cohesion in times of crisis provide essential support to enhance coping and resilience. Additionally, middle managers, who are responsible for implementing care plans in care units, must take into account care nurses' experience when managing the response to the existing demands in situations of crisis (Estalella et al., 2020).

The results suggest that nurses made more autonomous clinical and pharmacological management decisions than in their regular care practice, which was more pronounced in ICUs. This was also pointed out by other authors (Lake, 2020) and led to healthcare systems, such as the American healthcare system, adopting

Table 3

Descriptive analysis of the questionnaire's closed questions (>10 years' professional experience vs. <10 years, basic vs. advanced training, and UCC vs. HES) → only statistically significant differences.

	Professional experience			Academic level			Unit		
	<10 years n (%)	>10 years n (%)	p-value	Undergraduate n (%)	Postgraduate n (%)	p-value	HES n (%)	UCC n (%)	p-value
SAFETY									
I have equipment to ensure I am safe			0.049			0.117			0.004
Never	4 (1.4)	5 (1.7)		6 (1.5)	3 (2.2)		7 (3.3)	2 (0.6)	
Sometimes	102 (37.9)	77 (27)		132 (32)	46 (33.3)		82 (38.5)	86 (27.6)	
Most of the time	127 (47.2)	153 (53.6)		218 (52.9)	60 (43.5)		96 (45.1)	174 (55.8)	
Always	36 (13.3)	50 (17.5)		56 (13.6)	29 (21)		28 (13.2)	50 (16.0)	
I am afraid of making mistakes			0.025			0.046			0.518
Never	3 (1.1)	10 (3.5)		8 (1.9)	5 (3.6)		3 (1.4)	8 (2.6)	
Sometimes	121 (45)	121 (42.6)		175 (42.6)	64 (46.4)		97 (45.5)	135 (43.4)	
Most of the time	72 (26.7)	97 (34.1)		120 (29.2)	48 (34.8)		69 (32.4)	91 (29.3)	
Always	73 (27.1)	56 (19.7)		108 (26.3)	21 (15.2)		44 (20.7)	77 (24.8)	
Perceived lack of knowledge			0.093			0.020			0.260
Never	6 (2.2)	16 (5.6)		11 (2.7)	11 (8)		11 (5.2)	9 (2.9)	
Sometimes	148 (55)	166 (58.4)		229 (55.7)	82 (59.4)		125 (58.7)	174 (55.9)	
Most of the time	75 (27.8)	62 (21.8)		107 (26)	30 (21.7)		52 (24.4)	76 (24.4)	
Always	40 (14.8)	40 (14.1)		64 (15.6)	15 (10.9)		25 (11.7)	52 (16.7)	
Healthcare workers are asked to perform tasks for which they have not been trained			0.225			0.004			0.000
Never	20 (7.4)	28 (9.8)		27 (6.6)	21 (15.2)		34 (15.9)	11 (3.5)	
Sometimes	138 (51.5)	155 (54.4)		216 (52.5)	75 (54.4)		126 (59.2)	152 (48.9)	
Most of the time	68 (25.37)	73 (25.6)		115 (28)	24 (17.4)		33 (15.5)	103 (33.1)	
Always	42 (15.67)	29 (10.1)		53 (12.9)	18 (13)		20 (9.4)	45 (14.5)	
I think about the possibility of becoming infected with COVID-19 while carrying out my healthcare duties			0.004			0.984			0.618
Never	3 (1.1)	11 (3.8)		10 (2.4)	4 (2.9)		5 (2.4)	8 (2.6)	
Sometimes	71 (26.4)	105 (37.1)		131 (32)	43 (31.2)		68 (32.1)	99 (31.8)	
Most of the time	80 (29.7)	74 (26.1)		116 (28.3)	38 (27.5)		54 (25.5)	94 (30.2)	
Always	115 (42.7)	93 (32.8)		153 (37.3)	53 (38.4)		85 (40.1)	110 (35.4)	
I am afraid of infecting the people I live with/I have contact with			0.035			0.368			0.990
Never	2 (0.7)	4 (1.4)		4 (1)	2 (1.5)		2 (0.9)	3 (0.9)	
Sometimes	26 (9.6)	51 (17.9)		51 (12.4)	25 (18.1)		29 (13.6)	43 (13.8)	
Most of the time	63 (23.4)	59 (20.7)		92 (22.3)	29 (21)		46 (21.6)	71 (22.8)	
Always	178 (66.2)	171 (60)		265 (64.3)	82 (59.4)		136 (63.9)	195 (62.5)	
ORGANISATION									
How do you view the patient-nurse ratio? (Highly appropriate - Highly excessive)			0.189			0.346			0.000
Appropriate	55 (20.4)	84 (29.6)		86 (20.9)	39 (28.3)		73 (34.4)	59 (18.9)	
Highly appropriate	1 (44.2)	134 (47.2)		5 (1.2)	1 (0.7)		103 (48.6)	165 (52.9)	
Excessive	137 (20.8)	55 (49.5)		210 (51.1)	64 (46.4)		34 (16.0)	84 (26.9)	
Highly excessive	76 (2.6)	11 (3.8)		110 (26.8)	34 (24.6)		2 (0.9)	4 (1.3)	
There are problems in the organisation and distribution of work			0.467			0.007			0.054
Never	12 (4.4)	10 (3.5)		9 (2.2)	12 (8.7)		14 (6.6)	7 (2.2)	
Sometimes	152 (56.5)	150 (52.6)		230 (55.8)	70 (50.7)		118 (55.4)	166 (53.2)	
Most of the time	74 (27.5)	80 (28)		117 (28.4)	36 (26.1)		56 (26.3)	91 (29.2)	
Always	31 (11.5)	45 (15.8)		56 (13.6)	20 (14.5)		25 (11.7)	48 (15.4)	
The hospital provides fluids and food to prevent physical exhaustion during shifts			0.207			0.016			0.001
Never	83 (30.8)	103 (36.3)		139 (33.7)	45 (32.8)		90 (42.5)	85 (27.2)	
Sometimes	102 (37.9)	107 (37.7)		163 (39.6)	46 (33.6)		64 (30.2)	136 (43.6)	
Most of the time	56 (20.8)	57 (20)		85 (20.6)	26 (19)		38 (17.9)	67 (21.5)	
Always	28 (10.4)	17 (6)		25 (6.1)	20 (14.6)		20 (9.4)	24 (7.7)	
DECISION MAKING									
Feels that he or she has had to exercise a greater degree of autonomy in the administration of drugs compared to in usual practice			0.013			0.248			0.000
Never	33 (12.4)	57 (20)		61 (14.8)	29 (21)		50 (23.5)	35 (11.3)	
Sometimes	106 (39.7)	120 (42.1)		174 (42.3)	51 (37)		103 (48.4)	113 (36.3)	
Most of the time	74 (27.7)	73 (25.6)		113 (27.5)	33 (23.9)		39 (18.3)	99 (31.8)	
Always	54 (20.2)	35 (12.3)		63 (15.3)	25 (28.4)		21 (9.9)	64 (20.6)	
Feels that he or she has had to exercise a greater degree of autonomy in the clinical management of COVID-19 patients compared to in usual practice			0.000			0.178			0.000
Never	6 (2.2)	20 (7)		16 (3.9)	10 (7.2)		19 (8.9)	6 (1.9)	
Sometimes	85 (31.6)	131 (45.9)		164 (39.8)	51 (37)		91 (42.7)	111 (35.6)	
Most of the time	99 (36.8)	81 (28.4)		92 (22.3)	39 (28.3)		66 (31)	107 (34.3)	
Always	79 (29.3)	53 (18.6)		140 (34)	38 (27.5)		37 (17.4)	88 (28.2)	

Table 3 (continued)

	Professional experience			Academic level			Unit		
	<10 years n (%)	>10 years n (%)	p-value	Undergraduate n (%)	Postgraduate n (%)	p-value	HES n (%)	UCC n (%)	p-value
Feels that he or she has had to take on decisions made by other professionals that have caused him/her moral suffering			0.010			0.990			0.276
Never	57 (21.2)	59 (20.7)		85 (20.6)	30 (21.7)		50 (23.5)	61 (19.5)	
Sometimes	139 (51.7)	180 (63.2)		239 (58)	78 (56.6)		112 (52.6)	190 (60.9)	
Most of the time	50 (16.8)	29 (10.2)		58 (14.1)	20 (14.5)		35 (16.4)	39 (12.50)	
Always	23 (8.5)	17 (5.9)		30 (7.2)	10 (7.2)		16 (7.5)	22 (7.1)	
COMMUNICATION AND RELATIONSHIPS BETWEEN TEAM MEMBERS									
There is a lot of teamwork between physicians and nurses			0.624			0.792			0.039
Never	25 (9.3)	26 (9.1)		40 (9.7)	11 (8)		23 (10.8)	26 (8.3)	
Sometimes	120 (44.6)	138 (48.4)		188 (45.6)	67 (48.5)		110 (51.6)	134 (42.9)	
Most of the time	92 (34.2)	96 (33.7)		143 (34.7)	44 (31.9)		57 (26.8)	121 (38.8)	
Always	32 (11.9)	25 (8.7)		41 (10)	16 (11.6)		23 (10.8)	31 (9.9)	
There are good working relationships between physicians and nurses			0.953			0.031			0.008
Never	4 (1.5)	5 (1.7)		6 (1.5)	3 (2.2)		0 (0)	9 (2.9)	
Sometimes	98 (36.6)	101 (35.4)		143 (34.7)	53 (38.7)		89 (41.8)	99 (31.8)	
Most of the time	136 (50.7)	150 (52.6)		227 (55.1)	59 (43.1)		106 (49.8)	164 (52.7)	
Always	30 (11.2)	29 (10.2)		36 (8.7)	22 (16)		18 (8.5)	39 (12.5)	
PSYCHO-SOCIO-EMOTIONAL NEEDS									
Humor and other distraction strategies are used by the healthcare team to help team members cope with the emotional burden			0.043			0.115			0.442
Never	15 (5.6)	17 (6)		21 (5.1)	11 (8)		12 (5.6)	19 (6.1)	
Sometimes	89 (33.1)	125 (44)		169 (41)	43 (31.4)		76 (35.7)	130 (41.6)	
Most of the time	122 (45.3)	99 (34.8)		163 (39.6)	56 (40.9)		93 (43.7)	115 (36.9)	
Always	43 (16)	43 (15.1)		59 (68.7)	27 (19.7)		32 (15)	48 (15.4)	
I have the possibility of venting my emotions by sharing them with people who support me			0.000			0.741			0.805
Never	28 (10.5)	57 (20.2)		63 (15.4)	21 (15.3)		33 (15.6)	46 (14.9)	
Sometimes	79 (29.5)	106 (37.6)		142 (34.7)	41 (29.9)		66 (31.1)	109 (35.3)	
Most of the time	110 (41)	73 (25.8)		134 (32.8)	48 (35.1)		74 (34.9)	100 (32.4)	
Always	51 (19)	46 (16.3)		70 (17.1)	27 (19.7)		39 (18.4)	54 (17.5)	
I can fall asleep easily and have a good night's sleep			0.022			0.006			0.859
Never	83 (30.9)	64 (22.5)		108 (26.3)	38 (27.5)		59 (27.7)	82 (26.4)	
Sometimes	135 (50.4)	149 (52.3)		225 (54.7)	56 (40.6)		104 (48.8)	161 (51.8)	
Most of the time	34 (12.7)	59 (20.7)		58 (14.1)	35 (25.4)		39 (18.3)	50 (16.1)	
Always	16 (6)	13 (4.5)		20 (4.9)	9 (6.5)		11 (5.2)	18 (5.8)	

changes in the regulation of professional competencies during the crisis, such as the waiving of medical prescriptions for diagnostic tests or certain drugs or allowing advanced nurse practitioners to make decisions without medical supervision (Centers for Medicare Medicaid Services, 2020).

However, this situation was not considered to be negative in the case of more experienced and better trained nurses, who felt that they implemented care interventions that were consistent with their level of competence and whose perception of the care they provided was safe and under control. Unfortunately, this expertise is not officially supported with training in Spain despite the proposals put forward by the SEEIUC (Raurell-Torredà, 2020). As pointed out by Glasper (2020), considerable periods of training and years of experience are required to become a competent critical care nurse. During this crisis, many nurses have provided care at the CCU outside of their own field of expertise, which required extensive mentoring by expert nurses. In this sense, it is interesting to reflect on the findings of Chen et al. (2009), which highlight the value of sharing knowledge among co-workers in terms of strengthening professional commitment.

Finally, it should be noted that nurses' widespread perception of the impossibility of attending to the psycho-socio-emotional needs of patients and families, coupled with difficulties in venting their emotions, increases the feeling of emotional fatigue. Nurses turn

out to be a group that is likely to experience more frequent and intense anxiety, depression, insomnia and psychological stress symptoms, primarily those working on the front line in HCHs (Lai et al., 2019). In addition, experts have also reported the risk for vicarious traumatization and compassion fatigue in nurses caring for patients with COVID-19 in CCUs and HESs (Alharbi et al., 2020). Willingness to care was found to be positively associated with professionalism, safety and self-confidence, and negatively associated with stress and negative experiences (Oh et al., 2017; Lee and Kang, 2020). Thus, it is recommended that initiatives to care for the mental health of clinicians during the crisis be maintained over time in the event of future outbreaks (McAlonan et al., 2007)

Limitations

This study has limitations that should be taken into consideration. Firstly, the questionnaire used was designed taking as references other questionnaires that have been modified to adapt them to the Spanish context, such as the PES-NWI, the MOSPSC and the Granada Burnout Questionnaire. It was not possible to conduct a pilot study analyzing the items' capacity for discrimination, although this would have been desirable. Secondly, the sampling

method was intentional, making use of professional-personal networks for access to and recruitment of participants, which could condition the generalisation of the results.

The needs identified during this first phase of the study gave us clear indications of where to go next using a qualitative approach (phase 2). There is a need to explore in depth the experience of nurses in order to shed more light and clarity on the needs identified and to explore the coping strategies developed to be urgently addressed by healthcare systems (Teti et al., 2020).

Conclusions

In response to the COVID-19 pandemic, CCU and HES nurses reported feeling insecure for fear of becoming infected and potentially carrying the virus. Nurses experienced increased workloads under stressful and precarious conditions, as well as an increase in autonomous decision-making. Communication with their immediate managers was not perceived as productive and they expressed difficulty in meeting patients' needs, particularly at the psycho-socio-emotional level. This study shows the discomfort experienced by nurses during the response to this pandemic as a result of the imbalance between workload and human resources and the lack of communication with mid-level managers. As a result, nurses expressed a high degree of emotional exhaustion, with difficulty in expressing their emotions. These nurses may be categorised as a vulnerable population, as they are overexposed to COVID-19 in their work environment and susceptible to developing psycho-emotional problems in the short and medium term. It is necessary to delve deeper into aspects related to their experiences in order to shed more light on aspects that could not be addressed using a quantitative approach.

Founding source

No founding source at the moment of submission.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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