



# Psychological, physical, and social effects of the COVID-19 pandemic on hospital nurses

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## Abstract

**Aim:** The study aim was to explore the physical, mental, and social effects of the COVID-19 pandemic on Austrian nurses working in hospitals.

**Background:** The COVID-19 pandemic required nurses to work extremely hard and over long periods, which can have physical, psychological, and social consequences.

**Methods:** This study was carried out using a qualitative descriptive design and data was collected through individual interviews using an interview guide. A qualitative content analysis was conducted taking both deductive and inductive approaches.

**Findings:** Eighteen nurses (average age of 34.7 years) participated in the study. Their *general attitude and feelings* regarding working during the COVID-19 pandemic in the hospital setting were positive. Several *behavioral changes* in the nurses' daily working and private daily lives were reported. *Psychological impacts* included the fear of infecting someone at home, insomnia, and sadness. Headaches, diarrhea, muscle tension, skin redness, and increased sweating were identified as the most common *physical impacts*. In terms of *social impact*, all nurses mentioned social isolation and the increased use of (new) media.

**Conclusions:** Working with people suffering from COVID-19 had psychological and physical effects on caregivers. Caregivers felt socially isolated in their private environments; however, they often compensated for this isolation by using social media.

**Implications for nursing and implications for nursing policy:** Staff perceived the provision of sufficient information, regular team meetings, and the employer's positive reinforcement as supportive, enhancing their feelings of security.

We recommend providing more psychological support and making structural adjustments in daily clinical practice to counteract the negative effects of working during a pandemic.

## KEYWORDS

health and safety, nursing policy, nursing, qualitative research

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## INTRODUCTION

On December 31, 2019, the China Country Office of the World Health Organization (WHO) received information about an unknown strain of pneumonia (Ryan et al., 2020, Dost et al., 2020, WHO, 2020a). The disease-causing pathogen was subsequently identified as “Severe Acute Respiratory Syndrome Coronavirus 2” (SARS-CoV-2), responsible for an infectious coronavirus disease (COVID-19) (WHO, 2020a). This novel coronavirus was identified as a new strain in a large family of coronaviruses, which had not previously been identified in humans (Tobaiqy et al., 2020). In January 2020, the first case of COVID-19 was detected and confirmed outside of China. Shortly afterwards, case reports were issued by the Republic of Korea, Thailand, Singapore, and Japan (WHO, 2020b). In March 2020, COVID-19 was declared to be a pandemic after it spread globally (Lai et al., 2020, WHO, 2020b, Tobaiqy et al., 2020). COVID-19 symptoms range from mild to severe; approximately 14% of people who contract COVID-19 become seriously ill and require medical treatment or hospital admission, whereas about 6% suffer fatal complications, for example, septic shock or cardiac arrest (WHO, 2020a, WHO, 2020b).

## Background

The treatment of severe COVID-19 complications, in many patients, demands the utmost commitment from hospital staff. They must provide the highest level of care, often with limited personnel resources. Clear communication and organizational structures are necessary to provide this care (Allenduck et al., 2017). During the COVID-19 crisis, however, inconsistencies in caregiver protection arose. For example, different health organizations provided varied recommendations regarding the use of various forms of respiratory protection (e.g., how long the protective masks could be worn), and not every hospital had enough suitable protective equipment available (Chughtai et al., 2020).

Several studies have shown that healthcare staff experienced another heavy burden, namely, frequently reporting staff concerns regarding the danger of putting their family members at risk of infection (Chen et al., 2020, Wu et al., 2020). The current study was carried out to explore how the burdens and uncertainties caused by COVID-19 in hospitals can negatively affect Austrian healthcare staff and especially the nurses who work on the frontline.

## Literature review

Current studies show that healthcare staff is at high risk of developing psychological distress and other mental health symptoms due to their exposure to COVID-19 in healthcare settings (e.g., Sun et al. (2020), Lai et al. (2020)). In a qualitative study by Lai et al. (2020), participants reported anxiety, depression, and insomnia symptoms, and more than 70% experienced psychological distress as a result of caring for

COVID-19 patients (Dosil et al., 2020). Lam et al. (2019) studied the psychological experiences of COVID-19 patients' caregivers, showing that the caregivers experienced negative emotions such as fatigue, discomfort, and helplessness at an early stage. Other quantitative study findings (Lai et al., 2020, Sun et al., 2020) have confirmed these results. One main risk factor that worsened the mental health outcomes was working on the frontline. Wu et al. (2020) showed that healthcare workers suffered psychological distress when they had to provide direct patient care, while Chew et al. (2020) concluded that numerous healthcare workers who were confronted with COVID-19 suffered from depression, moderate anxiety, and severe levels of psychological distress.

Beside the psychological effects associated with caring for COVID-19 patients, healthcare staff also experienced physical symptoms while working during the pandemic. Four of the most common symptoms reported in quantitative studies were insomnia, tiredness, throat pain, and headaches (Chew et al., 2020). Working during COVID-19 pandemic also seemed to influence the social lives of healthcare workers. The survey by Petzold et al. (2020) indicated that healthcare professionals were often concerned about becoming socially isolated and being separated from their family.

Most studies examined the psychological effects of COVID-19 on all healthcare professionals, including physicians, nurses, and allied healthcare professionals. These studies were primarily carried out in China, and the effects were measured quantitatively (e.g., Chew et al. (2020)). Studies conducted in European countries, especially focussing on nurses, are lacking. To the best of our knowledge, no qualitative study has been conducted to examine the combined physical, psychological, and social effects of COVID-19 on nurses working in hospitals. To gain deep insights into and improve our understanding and knowledge of the nurses' experiences and feelings in this context, we took a qualitative approach to gain insight into the individual meanings of the psychological, physical, and social effects of the COVID-19 pandemic and find explanations for these effects (Holloway and Galvin, 2016).

## Aim of the study

The study aim was to explore the physical, mental, and social effects of the COVID-19 pandemic on Austrian nurses working in hospitals.

## METHODS

### Research design

We used a qualitative descriptive design (Vaismoradi et al., 2013), carrying out individual interviews and a content analysis. A qualitative description method was used to directly describe and comprehensively summarize the subject of interest in the participants' native language, while adhering closely



to the data (Kim et al., 2017). A qualitative content analysis was performed (Elo and Kyngäs, 2008, Mayring, 2010, Schreier, 2012) on information gathered in individual interviews.

Criteria on the COnsolidated criteria for REporting Qualitative research (Tong et al., 2007) checklist were considered during study planning and reporting.

## Sample and setting

The participants (nurses providing bedside care) were recruited by nursing scientists and nursing directors working in healthcare institutions. The nursing directors were informed about the planned study and acted only as gatekeepers. Purposive sampling was chosen as the sampling strategy. A sampling plan (Hussy et al., 2010) was developed with the aim to include a heterogeneous and representative group of nurses. This group included younger and older nurses (<30 years, 30–50 years, and >50 years) working in private and public hospitals in urban and rural regions in two Austrian federal states. These nurses had different contact frequencies with COVID-19 patients (rare to permanent).

## Participants

The inclusion criteria were being a nurse, working in a hospital setting at the bedside, being a female or male of 18 years of age or older, having been in contact with suspected COVID-19 cases or cases that tested positive during the professional practice, and speaking and understanding the German language. Other healthcare professionals, nursing aides, nursing managers, and nurses who did not work at the bedside were excluded from the study.

## Data collection

To collect the data, 18 individual interviews were conducted in May and June 2020 with hospital nurses. Demographic characteristics were explored by asking quantitative standardized questions at the beginning of the interviews (Table 1). An interview guide based on the study by Koehler and Meyer (2017) was developed and used to conduct the interviews (Table 2). The interviews were structured to contain introductory, transition, key, final, and summary questions (Krueger & Casey, 2009). In a pilot test using this guide, six preliminary interviews were conducted, and the required adaptations were subsequently made (Mayring, 2010).

The interviews were either carried out in a quiet (home or work) environment ( $n = 17$ ) or by video conference ( $n = 1$ ). Only the interviewer and the participant were present at the interview. The interviewer made field notes during the interview.

All interviews, lasting 27 min on average, were audio recorded on a smartphone, tablet, or PC. ; The recordings were transcribed verbatim and analyzed by the authors.

**TABLE 1** Characteristics of the sample ( $n = 18$ )

Gender	<i>n</i> (%)
Female	14 (77.8)
Male	4 (22.2)
Age in years	Mean (SD)
Average age (total)	34.72 (10.1)
Average age (female)	35.35 (10.79)
<b>Education</b>	<b><i>n</i> (%)</b>
Nursing diploma	11 (61.1)
Nursing diploma with special training (e.g., in intensive care)	3 (16.7)
Nursing diploma with an academic degree	4 (22.2)
<b>Faculty/Ward</b>	<b><i>n</i> (%)</b>
Internal ward	9 (50.0)
Intensive care unit	6 (33.3)
Emergency room	2 (11.1)
Psychiatric ward	1 (5.6)

**TABLE 2** Interview guideline

Interview guideline	
Introductory questions	When and how did you first come across COVID-19?
Transition questions	Would you describe working during COVID-19 as an exceptional situation? What experience do you have in general with exceptional situations? How did you adapt to this crisis (mentally or physically)? How did you find out about the current COVID-19 developments during this time of crisis?
Key questions	How did you feel when dealing with (potential) COVID-19 patients? Were you able to observe changes in everyday behavior regarding COVID-19 itself? If so, why do you think there have been changes in behavior? What mental or psychological effects could you observe in this exceptional situation? What physical effects were you able to observe in this exceptional situation? What social effects were you able to observe in this exceptional situation? Did the crisis change your motivation to do your job? Has anything else changed with COVID-19 in your professional activities/daily life? How did you feel about these changes?
Summary	Did I summarize our discussion correctly? Did I forget something?
Ending question	Would you like to add something that has not yet been discussed in our conversation?

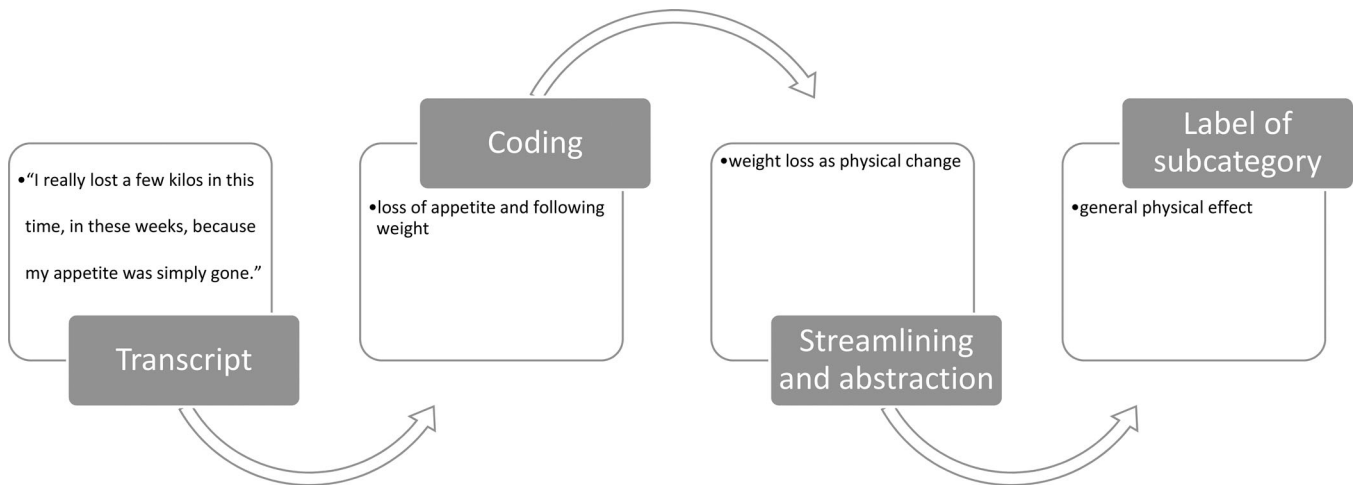


FIGURE 1 Development of a subcategory: From transcript to inductive subcategories

## Research team and reflexivity

The interviews were conducted by the authors (K. K., T. H., L. N., A. O., A. P. S., P. W.) who are both master's degree students (male and female) in the field of nursing science and actively work as nurses. The interviewers were familiar with the process of working in the hospital setting, but no work or personal relationships existed between the participants and the interviewers. Before the interviews were carried out, the interviewers received training from experienced researchers on how to conduct an interview. The participants were provided with information about the interviewers' educational and professional backgrounds as well as the purpose of and reasons for the interview.

## Data analysis

A qualitative content analysis (Mayring, 2010, Schreier, 2012) of the interview content was carried out using both deductive and inductive coding frames. The coding framework consisted of main categories, which were defined deductively based on the interview guide, and of sub-categories, which were defined inductively based on the data and represent the dimensions of the categories (see Table 2). An example that illustrates the development of an inductive subcategory is shown in Figure 1. A definition was created for each main category and subcategory, which was documented with anchor examples (Mayring, 2010). To allow different people to perform the coding, interview data were thematically segmented (Schreier, 2012). The coding frame was then discussed and refined by these researchers together with their supervisors, and a final version was created. The remaining interview content was analyzed by the authors using the final coding frame. The codes for the respective categories were generalized and summarized (e.g., binding, integration) by three authors. The summary statements were discussed with

the remaining authors. The software MAXQDA Analytics Pro was used to support the data analyses.

## Rigor

To establish credibility, the interviewers summarized the main statements again at the end of the interviews. This provided the interviewer with an opportunity for clarification and further comments. If desired, the interviewees could read and comment on their interview transcript; however, none of the participants took advantage of this offer. In addition, peer debriefing was conducted in the master's students' meetings to discuss the method used and receive feedback from supervisors and colleagues. The coding frame was developed and tested by two researchers independently based on the first six preliminary interview transcripts. These researchers subsequently reached a consensus to ensure the validity and confirmability of the interview process.

## Ethical considerations

Ethical approval for the study was obtained from the Ethics Committee of the Medical University of Graz (1237/2020). Only participants who were informed verbally and in a written form about the study and gave their written consent to participate were included in the study. The informed consent sheet was sent in advance by e-mail; the nurses had to sign and return this sheet to the interviewer to participate in the study.

## FINDINGS

In total, 18 nurses agreed to participate. Most nurses were female, between 18 and 53 years of age and had a nursing diploma but had not received any further education (Table 1).



The participants described COVID-19 as an exceptional situation, and most stated that they had already gained general experience with exceptional situations in the hospital setting.

Nevertheless, some also commented that they were neither physically nor mentally prepared for such an event.

## General attitudes and feelings

The interviewed nurses stated that they experienced both positive and negative feelings when dealing with COVID-19 patients. Positive feelings included gratitude, support from the employer, and team spirit. The nurses received gratitude in private settings from, for example, friends and acquaintances, but also from the patients, who were happy when someone came into the room and talked to them.

Employer support, provided in the form of regular team meetings, information updates about the current situation, or service instructions, was also perceived positively. Many of the respondents said that wearing protective equipment gave them a feeling of safety, which improved their attitudes toward the prevailing situation. The team spirit and support experienced as a team member was reinforced by the COVID-19 crisis, which caused many nurses to appreciate the team they were working with more deeply.

The negative feelings included fear, nervousness, frustration, and tension. The most common response given when the nurses were asked about their greatest fear was that they were afraid of bringing the virus back home. At the beginning of the crisis, the nurses were nervous and sometimes unsettled because no one knew exactly what was going to happen to them, how much work would be required, or how dangerous the virus was. Many held certain stereotypical views of China or Italy, which intensified these negative feelings. Many of the interviewed nurses felt frustrated due to the increased workload under difficult conditions and the need to comply with special requirements, for example, the use of additional protective equipment.

Some responded to this exceptional situation with neutral feelings; they perceived the situation as part of the routine or a habit and as part of their job that they must manage.

## Behavioral change

### Changing behaviors in daily work

Nurses had to perform more educational work when dealing with patients, such as explaining the correct hand hygiene or the applicable hygiene regulations on the ward. Nurses also were required to convey a sense of calm, as the patients were very anxious; however, this was challenging because they did not know what exactly was happening in the coronavirus pandemic, whether the patients were infected or not, or how badly this disease would affect them.

Another change concerned the treatment of visitors. Nurses had to instruct visitors that they were not allowed to visit

patients in the hospital and that all people who did not work directly on the ward had to leave immediately.

Many participants stated that the way they worked in a multiprofessional team changed: team cohesion was strengthened but the communication within the multiprofessional team altered during the pandemic. Nurses could communicate effectively with some medical doctors, but others avoided patient contact, and the communication about the patients could only take place between the nurses and medical doctors. Thus, nurses had to inform the doctors of the patients' conditions either face-to-face or by phone. More multiprofessional team meetings also took place to discuss the current situation.

This pandemic also led to changes in the respondents' safety measures, including general measures (e.g., wearing protective equipment like coats, hoods, gloves, or glasses) and new measures that were introduced on the ward (e.g., keeping a physical distance of 2 m between the beds or allowing a maximum of four nurses in a room when a shift change occurred).

Nurses reported on organizational changes that occurred, such as the cancellation of planned procedures, treatment of only emergency patients, and alterations in the working shifts and hours. The staff members on a ward were divided into several small teams, which were alternated over 1 or 2-week intervals to minimize the risk of infection within the team. This required the suspension of the Austrian Working Time Act and the implementation of a lock or bunk system on the COVID-19 stations. The latter meant that, when nurses entered this station, they stayed inside for three to four hours to take care of the patients but were not able to go to the toilet or to eat or drink.

A few nurses stated that the legal regulations were their main reason for changing their behavior.

### Changing behaviors in private daily life

Many nurses altered their daily behavior to perform new tasks and take on new responsibilities that emerged due to the lockdown and changed their daily routine. For example, childcare changed; children no longer could attend school and had to be home-schooled and supervised at home. Many of the respondents' partners also worked in hospitals or in a profession where home office was not an option. Nurses perceived it as a logistical challenge to reconcile their working and private lives and the demands to home-school their children.

Several nurses reported that their behavior and attitudes changed, especially in the private sphere, indicating that they became more aware of themselves and tried to find a better work-life balance (not the case before the COVID-19 crisis). Others reported that they deliberately avoided news and media to avoid constant confrontation with the COVID-19 pandemic.

As they applied hygiene measures in hospital, nurses stated that they applied personal protection or hygiene measures much more precisely in their private daily lives. Nurses mentioned the increased observance of safety distances and personal hygiene measures and especially hand hygiene. The

nurses washed and then disinfected their hands much more frequently when they were not at work than normal, primarily due to their own sense of responsibility. Many nurses wanted to protect people in their social environment and members of their private daily lives by carrying out responsible measures. Some people perceived themselves as a security risk because they knew that they could potentially infect other people.

## Effects on mental and psychological health

Most nurses reported effects on their mental and psychological health due to caring for COVID-19 patients.

When asked how the coronavirus crisis had affected their motivation to go to work, most said that they were even more motivated, noting that they were happy to have a secure job despite the crisis, they could see their work colleagues and not only have to exchange information by phone or video conference, and that they could receive positive feedback and the patients' gratitude.

Only a few participants stated that their motivation for going to work had been reduced by COVID-19, citing the high workload associated with the care of COVID-19 patients and the fear of being able to infect someone at home due to the job as primary reasons.

Negative effects of the COVID-19 pandemic reported by the nurses were anxiety and tearfulness. The more strenuous working conditions also triggered psychological stress in some respondents. A recurring theme was also the psychological stress due to fear for family members or friends. Some nurses doubted whether they wanted to do their job or wondered why they were doing this job.

Some even imagined physical symptoms, for example, feeling as though they had a fever without really having one.

A few respondents stated that the crisis had no specific effects on their mental or psychological health, citing reasons such as good communication at home or within the team. One participant explained that they considered the absence of mental and psychological effects as normal due to the attitude of other colleagues in this profession. They also mentioned that complying with the safety measures helped them to cope with the stressful situation.

## Physical effects

The respondents named general physical effects, for example, headaches, diarrhea, muscle tension, and unwanted weight loss, due to the stress they experienced during the coronavirus crisis.

One nurse reported contracting COVID-19. The course of the disease was mild, but she still cited classical symptoms, such as lack of smell and taste, mild fever, and shortness of breath.

In terms of physical effects, nurses mentioned many negative effects associated with wearing protective clothing (e.g., headaches, skin rashes, fatigue, breathing problems, and

increased sweating) and complained about suffering from wounds or sore areas due to the constant disinfection and wearing the masks.

This was accompanied by the restrictions regarding the fulfilment of physical needs, for example, not being able to use the bathroom regularly or drink enough water.

Some people changed the ways they moved in their free time. Performing more sports was mentioned as a compensation for reduced movement. Running and doing yoga were mentioned as sports most often. Some nurses indicated that they were unable to perform their usual sports activities and, therefore, performed sports less frequently.

Many respondents addressed the topic of changing sleep, relaxation, and regeneration. Many of the responses indicated that the nurses felt exhausted, as though their thoughts were going around in circles, or that they felt overwhelmed, which kept them from experiencing proper relaxation and regeneration. One of the biggest issues mentioned was sleep disorders, which were experienced by many nurses. A few respondents did not experience physical changes at all.

## Social effects

Social isolation is an issue that was mentioned by all nurses. They told the interviewers that one of the biggest challenges they faced was no longer being able to see their families, friends, and acquaintances. This concern was mentioned by nurses of both genders, of all ages, in all locations (city/country), and regardless of how many people (alone to more than eight people) lived in a common household.

However, all respondents indicated that they used the telephone or video telephony more often than usual to stay in touch with friends and family. Most often, new social media platforms, such as WhatsApp®, Skype®, Zoom®, and Microsoft Teams®, were used in the form of messages or video calls (Table 3).

## DISCUSSION

In this qualitative study, a heterogeneous group of hospital nurses was investigated to gain various insights into psychological, physical, and social effects of caring COVID-19 patients on nurses. Findings are reported in five main categories: general conditions and feelings, behavioral change, effects on mental and psychological health, physical effects, and social effects.

The study findings show that working with COVID-19 patients had different effects on the psychological health of the participants, who expressed both positive and negative feelings. The coexistence of positive and negative feelings during the COVID-19 pandemic is also mentioned in other literature (Sun et al., 2020).

Participants in our study also mentioned feeling safer when equipped properly with personal protective equipment. Cai et al. (2020) showed that a lack of protective clothing can cause



TABLE 3 Coding frame, including qualitative comments

Category	Qualitative comments
<b>General condition and feelings</b>	
Positive feelings	"I have learned to appreciate my team and my colleagues very much or even more."
Negative feelings	"...that put pressure on me ..." "At the beginning there was definitely an uncertainty."
Neutral feelings	"After 1-2 weeks, it becomes part of the routine."
<b>Behavioral change</b>	
Changing behaviors in daily work	
Dealing with patients	"So, you go there more cautiously, but not necessarily more distanced, no way, but you also have to do more educational work with the patient."
Dealing with visitors	"One of the main changes was the ban on visiting."
Dealing in a multiprofessional team	"The cohesion in the team has even increased." "There have been team meetings in advance where we talked about it because the situation was not so easy because of many pregnancies, the cohesion was definitely there. And in the meantime, a lot was done with team building."
Changes in safety measures	"What was difficult, of course, was the additional protective equipment that we simply do not have to wear so often and for so long." "We always try to work carefully, or I try to work carefully too, and pay attention to self-protection, but that was in a completely different league (...) if you worked there."
Organizational changes	"Well, I just think, in general, that the planned things have been shut down. Really only emergency procedures were allowed in the emergency rooms, visitors were not allowed, and all the security personnel that were standing in front of the entrances ..."
Personal changes	"I questioned myself. Okay, did I do everything right?" "(...) because you have always seen it in media, washing your hands, wearing face masks, that's what you have to do, that's what you have to do, when you go shopping or when you go somewhere else. It is mandatory anyway."
<b>Changing behaviors in private daily life</b>	
New tasks and responsibilities	
Changed behaviors and attitudes	"That was the factor that really stressed us out, that we suddenly had to look after them [children], that we had to guarantee care, that we had to guarantee home-schooling." "... if something like this happens, you pay more attention in general."
Personal protective/hygiene measures	"And now I am already thinking, what do I touch, how do I touch it, and what do I touch afterwards." "Also, the hand disinfection accompanies you, not only professionally but also privately." "(...) out of respect and because I do not live alone, I do not want to infect my partner and in further consequence the family of my partner, where also high-risk patients are present. That is this chain of infection, which you want to break and therefore you try to implement everything that is possible for yourself." "Again, this feeling of guilt... I cannot see people because I must protect them from me. You start thinking about that, I thought about that a lot at the beginning."
<b>Effects on mental and psychological health</b>	
No mental and psychological effects	"Because our team cohesion is so unbelievably good, we discussed stressful situations there, and it did not take long to get back on track."
Mental and psychological effects	"Am I having trouble breathing? Am I feeling a little strange?" "Since we worked an enormous amount of overtime, especially in March and April, we reached our limits." "It's bad because you never knew: Are they alright? (...) It was horrible for me." "The motivation has received a boost."
<b>Physical effects</b>	
General physical effects	
Changed ways of movement	"I really lost a few kilos in this time, in these weeks, because simply my appetite was gone." "I got infected at work. I was lucky that I did not feel bad, so I had mild symptoms and was then of course in quarantine." "I was not able to do sports as usual." "You just take time for myself and look for balance, so there were also different possibilities listed (...) and personally, I did a lot with sports, like running or doing yoga."

(Continues)



TABLE 3 (Continued)

Category	Qualitative comments
Physical effects from wearing protective/hygiene measures	<p>"Wearing masks was bad, I got a rash."</p> <p>"... you start sweating immediately, you have the feeling that you can hardly breathe through the mask."</p> <p>"(...) some days you were just dizzy, you knew you could not go to the toilet for the next 3-4 hours and you could not drink (...) and you could not eat and yes (...)"</p>
Changes in sleep, relaxation, and regeneration	<p>"I came home... tired, exhausted, ..."</p> <p>"Just before you fall asleep, when you're lying in bed and you think: "Now I'm going to be called and now it's going to start and now I have to go to work and everything is going to escalate and you hear the stories of Italy and if that's the case here, then it's going to be a disaster. In the end, you still haven't relaxed as you were told to."</p>
<b>Social impact</b>	
Social isolation	<p>"Since I like to spend a lot of time with friends, this was bad for me. The worst thing for me was that I could not see my godchildren."</p> <p>"The fact that I did not go home (to my parents) was, of course, also a big limitation and that I cannot meet anyone."</p> <p>"At home, it was sad. You feel alone when you cannot see anyone."</p>
Increased use of (new) media	<p>"...but then we started making video calls or writing WhatsApp messages."</p> <p>"I have talked on the phone a lot, with friends. And of course, I wrote lots of WhatsApp messages."</p>

stress, especially among older staff. These findings highlight the importance of providing sufficient protective clothing. In our study, we found that nurses who worked on COVID-19 wards were generally required to perform new tasks and that their responsibilities as caregivers changed. These changes affected the multiprofessional collaboration and communication.

We also found that the participants felt positive and thankful when they received gratitude from friends, acquaintances, and patients. Sun et al. (2020) came to a similar conclusion, stating that the patient's goodwill, respect, active cooperation, and gratitude was responsible for these feelings, such as appreciation.

Nursing staff were highly motivated to adapt their work processes and procedures to fit the situation and to actively participate in containing the infections.

McClung et al. (2017) identified patient safety and improvements in clinical outcomes as major factors that motivated healthcare staff to reduce infections, but these factors were not mentioned by participants in our study. This may be due to uncertainties regarding the course of the disease. Nurses did not know what clinical outcomes they should expect.

McClung et al. (2017) also found additional motivating factors, such as legal regulations (i.e., policies), regulatory considerations, and financial penalties, that were not identified as motivating factors in our study. Many of the nurses we interviewed stated that, although such guidelines existed, their recommendations were not always uniform, which also led to uncertainty.

Most of our participants stated that working during the COVID-19 pandemic had effects on their mental health, a finding that has been cited in other international studies. In a systematic review by Bohlken et al. (2020), the authors concluded that the severity of the stress and depressive and anxious symptoms experienced were influenced by the proximity to COVID-19 patients. Because the participants in our study

all had close contact with COVID-19 patients, we predicted that they may also have experienced high levels of stress; this prediction is supported by the interview statements. Some of our participants stated that they developed symptoms of depression that required treatment. It is not a standard practice for nurses to receive professional support when they come into contact with infectious patients (Chen et al., 2021). Imagining physical symptoms, psychological stress, and the fear of infecting family members were also reported as psychological effects of working with COVID-19 patients. Similar negative effects on the mental wellbeing of healthcare workers have been documented in several international studies (Cai et al., 2020, Chen et al., 2020, Chew et al., 2020). Maintaining the mental wellbeing of staff is essential to ensure that the crisis is more effectively controlled.

The most common physical effects described by participants in our study were headaches, diarrhea, muscle tension, skin rashes, breathlessness, increased sweating, insomnia, relaxation, and regeneration problems. Insomnia was confirmed as one of the main physical effects on nurses during this pandemic by the results of quantitative studies (Chew et al., 2020, Zhang et al., 2020).

Nurses in our study experienced physical effects, such as headaches, skin rashes, sweating, and breathlessness because they had to wear protective clothing for long periods. In the quantitative study by Foo et al. (2006), 35.5% of the personnel examined displayed evidence of skin irritations (acne, itching, and rashes) because they wore protective clothing over long periods, and 21.4% of the personnel showed evidence of skin irritation on their hands due to the excessive use of gloves (dry skin, itching, rashes, and wheals). Ong et al. (2020) provided clear evidence that medical staff developed headaches associated with personal protective equipment or suffered exacerbations of their preexisting headache disorders while wearing N95 masks and protective eyewear for over four hours per day.





To reduce unwanted physical effects, employers should ensure that employees do not have to continuously wear protective equipment for longer than the recommended duration. Employers should also allow employee to take more breaks. Caregivers including nurses should be instructed to pay more attention to skin care, and skin care products should be made available at the workplace. It is highly unlikely that nursing staff will be able to provide high-quality care over long periods of time unless they receive support for the above-mentioned symptoms from their employer.

All the participants in our study mentioned that working during the COVID-19 pandemic had an influence on social aspects of their lives. Social isolation was addressed as a negative effect by the respondents. In our study, we discovered that the social effects were the same, regardless of whether the participants were women or men or differed in age, marital status, or region (city/countryside). All respondents used new media to get in touch with other people. It seems as though it is simple and intuitive to use these media platforms and that these platforms are widely available to the population.

Only one of 18 interviews was conducted using a video conference method rather than as an in-person interview. This may not have an impact on the results. The study by Krouwel et al. (2019) examined whether differences between in-person interviews and video conference interviews occurred. The results show that both interview methods achieved a comparable number of words and topics/codes. In our study, no difference was noted in the lengths of the interviews; a similar number of codes in the video conference interview and the in-person interviews were counted.

## Strengths and limitations

A purposive sampling method was used, which could have influenced the results of the study. It is more likely that individuals who are willing to vocalize their experiences and feelings took part in the interviews. It could be, however, that people who experienced a traumatic situation did not want to share their feelings and declined to participate in this study. This study took place in Austria, and the participants were local residents, which might limit the potential to compare the results of the study with those of studies of nurses in other countries. This might limit the transferability of the results.

Another limitation could be the relatively short length of the interviews (i.e., 27 min). The interviewers were concerned with adhering very closely to the reporting guideline, and, for this reason, may have asked fewer questions than more experienced interviewers, potentially limiting the results. However, as no new topics emerged in the interviews, recruitment was terminated after 18 interviews, as data saturation had been achieved.

One of the strengths of this qualitative study is that nurses from different hospitals with various levels of experience were included. In Austria, nurses with different levels of education (academic and non-academic) work together. To represent what is truly happening in practice, we deliberately included

nurses with different levels of education and experience in a balanced ratio (Hussy et al. 2010). The study population consisted of more female than male participants; this represents the common gender distribution in the nursing profession (Statistik Austria, 2021). The coding frame had a high surface validity, since each main category had several sub-categories, and the codes were equally distributed.

## CONCLUSIONS

COVID-19 has affected all the people all over the world, and especially nurses working in hospitals. By carrying out a qualitative study with individual interviews, five main categories were identified: general conditions and feelings, behavioral change, effects on mental and psychological health, physical effects, and social effects.

Mental and psychological effects included anxiety, tearfulness, and psychological stress. The most common physical effect observed was insomnia, followed by physical exhaustion and headache. One important finding of this study is the social effects of COVID-19 on nursing staff. All nurses reported that social isolation, such as not being allowed to meet family and friends physically, had the largest impact on their social lives. New social media platforms were increasingly used to stay in touch with other people.

Further intervention studies are needed to develop effective educational and psychosocial strategies to reduce the burden on nurses during a crisis.

## Implications for nursing and for nursing policy

The observed effects of the COVID-19 pandemic on the nurses' psyche indicate that more psychological support, either by employing psychologists, developing team-building measures, or increasing supervision, should be offered to healthcare workers. Changed roles and additional tasks should be discussed openly in the interdisciplinary team in order to clear up ambiguities and discrepancies at an early stage. Nurses perceived the provision of adequate protective clothing and sufficient, precise, and current information, as well as the holding of regular multiprofessional team meetings at the hospital, as supportive. Therefore, these are recommended. In addition, uniformity should be ensured, especially with regard to guidelines.

More structural adjustments should be made to relieve the physical burden on healthcare personnel, for example, by setting appropriate working hours with more breaks and providing less physically restrictive protective clothing. Adequate numbers of ward staff are essential to ensure that nurses can take breaks during shifts and provide the appropriate skill mix.

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## CONFLICT OF INTEREST


The authors have declared no conflict of interest.

## AUTHOR CONTRIBUTIONS

**Study design:** Alfred Häussl, Sandra Schüssler, Daniela Schoberer. **Data collection:** Katrin Knödl, Teresa Huber, Lydia Neundlinger, Asmir Osmanovic, Anja Plank-Straner, Petra Walter. **Data analysis:** Alfred Häussl, Eva Ehmann, Angelika Pacher, Katrin Knödl, Teresa Huber, Lydia Neundlinger, Asmir Osmanovic, Anja Plank-Straner, Petra Walter. **Study supervision:** Sandra Schüssler, Daniela Schoberer. **Manuscript writing:** Alfred Häussl, Eva Ehmann, Angelika Pacher. **Critical revisions for important intellectual content:** Sandra Schüssler, Daniela Schoberer.

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