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RESEARCH ARTICLE

# Resilience, Burnout and Wellbeing of Nurses during the Third Wave of COVID-19 in Cyprus

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**Abstract:**

***Background:***

Burnout is a state of physical and emotional exhaustion, and when experienced among healthcare workers, it is a sign of major concern for the health system. COVID-19 has induced a plethora of negative consequences, like extra workload on nurses, emotional stress, risk of infection to close family, and factors leading to burnout.

***Aim:***

This study aimed to measure the prevalence of burnout and resilience among nurses in Cyprus.

***Materials and Methods:***

An online questionnaire-based survey using Copenhagen Burnout Inventory and the Conor Davidson scale was carried out among all registered nurses in Cyprus. Burnout and resilience were defined at a cut-off score of 50 for each domain.

***Results:***

The prevalence of overall burnout was 54.26%. No significant difference was identified between the different demographics collected and burnout prevalence. Burnout was lower in the category of patient-related burnout (32.77%) compared to personal or work-related burnout (68.30% and 66.81%, respectively).

***Conclusion:***

There has been a significant prevalence of burnout found during the COVID-19 pandemic among nurses. On the contrary, our findings reflect that nurses have high resilience, something that is a benefit to the system as they never stop working. Nurses experiencing burnout have a higher tendency to leave their department/organization and their job, a fact that their management should have in mind. We suggest that management should be proactive and supportive in improving working conditions and providing assurance to employees. The long-term effects of the current pandemic need to be assessed later.

**Keywords:** Burnout, Connor-davidson resilience scale, Copenhagen burnout inventory, COVID-19 pandemic, Resilience, Nurses.

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## 1. INTRODUCTION

To date, the pandemic crisis of COVID-19 has been found to affect the lives and health of millions of people worldwide, and it continues to do so around the world [1]. During the pandemic, the healthcare systems have been faced with constant pressure for hospital beds, ICU beds, and ventilators. Several general hospital wards have been converted into isolation and treatment wards for COVID-19 patients. Concurrently, hospitals have been required to treat critically ill patients with extra beds in intensive care units due to an unprecedented demand for ventilators [2].

As a result, this increased number of infectious patients has threatened to collapse health systems around the world due to the consumption of medical resources [3]. The pressure on health systems due to the imminent risk of their collapse in

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various countries, has resulted in health professionals working overtime, which in turn potentially led to their isolation and other emotional disorders [4]. The pandemic has revealed the strengths and weaknesses of various health systems worldwide, but overall, it indicated a general lack of preparedness for such a crisis.

Nurses internationally have remained at the forefront and actively involved in managing this global threat [5, 6]. Health professionals who treat patients with COVID-19 are at a greater risk for developing depression, anxiety, and insomnia, as well as fear of infection for both themselves and their family members [6, 7]. Thus, the fear of transmission of infection to members of the nurses' families has led nurses to social isolation [8]. Similar results have been found during the Ebola and SARS pandemics, where depression, anxiety, and posttraumatic stress have been found to be the most common psychological disorders [4].

Cristina Maslach, in 1976, described burnout as "a syndrome of physical and mental exhaustion, in which the employees lose interest and any positive feelings they have for their patient or clients, cease to be satisfied with their work and their performance, and form a negative image of themselves" [9]. On the other hand, resilience is the ability to cope with a crisis mentally or emotionally or to return to the pre-crisis status quickly. Resilience exists when the person uses mental processes and behaviors in promoting personal assets and protecting themselves from the potential negative effects of a stressor event. Between burnout and resilience, there is a strong negative correlation as resilience includes the ability to cope and burnout is the exact opposite. Abram and Jacobowitz showed a significant inverse relationship between resilience and burnout among nurses, showing that as resilience increases, the level of the nurse's burnout decreases [10].

Researchers believe that this pandemic has exacerbated stressors in the healthcare systems, in which the existence of nurse's burnout in response to workplace stress is already an epidemic. Where the pandemic has been found to exacerbate existing risks for burnout, it has also triggered new risks, including the risk of exposure to the pathogen, long working hours, increased volume and severity of patients, critical decision-making, psychological distress, fatigue, and the high concern that professionals could be potential vectors of disease transmission to their families. Resilience, satisfaction with life, depression, and stress have been found to be potential predictors for all burnout dimensions.

A significant relationship has also been found between depression and all dimensions of burnout. Depression can have a negative impact on the health, performance, and productivity of workers, which can influence the quality of care provided and patients' health. Stress also seems to be a risk factor for burnout. High levels of stress have serious consequences for the well-being of individuals, and can lead to mental fatigue, difficulty in concentration, loss of immediate memory, and anxiety [11].

In many countries, during the pandemic, nurses have experienced heavy workload and staff shortages, as they did not have enough resources or personal protective equipment (PPE) [12 - 15]. Most importantly, it has been found that inadequate appropriate equipment, including PPEs, threatens nurses' collective ability to adhere to standard infection prevention and control practices [13]. In some cases, many decisions had been shown to have undesirable repercussions in terms of intrafamily violence, mental health disorders, and the renunciation of care [16]. Nurses with pre-existing mental health challenges had been at greater risk for burnout and even suicide.

Under these evolving stressful situations, nurses' physical and mental wellbeing needs a high level of attention [13], and the exacerbation of mental health issues and many chronic conditions are of great concern [17]. The unprecedented combination of unfavorable conditions, including a major healthcare reform and the establishment of a national health system in Cyprus, has raised serious concerns regarding the resilience and well-being of the Cypriot nurses' workforce. Thus, investigating burnout and resilience is an important research topic. The aim of this study was to investigate the burnout and mental resilience of Cypriot nurses during the COVID-19 pandemic crisis in order to identify the sources of support, policy recommendations, and interventions that need to be implemented, with the aim of strengthening and increasing the mental resilience of nurses in Cyprus and reducing the negative effects of burnout syndrome.

## 2. MATERIALS AND METHODS

### 2.1. Study Design

A descriptive cross-sectional research design was employed to assess the burnout and resilience of the nurses of the healthcare system in Cyprus as well as their intention to leave their departments, organization, or profession during the third wave of COVID-19.

### 2.2. Sample and Data Collection

An online questionnaire was developed on Google Forms and was disseminated to all nurses registered with the Cyprus Nursing and Midwifery Association (CYNMA) *via* email and the association's social media page. We have circulated the online questionnaire to 4,892 registered nurses. Participation in the study was fully voluntary and non-commercial, and all responses were anonymous. The online questionnaire was kept open between March 2021-April 2021, and the data were collected anonymously with no personally identifiable characteristics.

### 2.3. Instruments

Appropriate standardized tools with high validity and reliability that measure burnout and resilience were selected after a thorough literature search with the consensus of all investigators. The tools were used under open licensing. The self-reporting questionnaires are outlined below.

### 2.4. Connor–Davidson Resilience Scale-25 (CD-RISC)

The CD-RISC is a 25-item 5-point Likert scale that is used to measure resilience. This tool measures the ability to cope with stress and adversity. The participants had to rate the items

on how they felt for the past month. The scores for each question (0,1,2,3,4) are added and the total score ranges from 0 to 100, with higher scores reflecting greater resilience. The reliability coefficient of the Greek version of CD-RISC is 0.93 [18].

### 2.5. Copenhagen Burnout Inventory (CBI)

The Copenhagen Burnout Inventory (CBI) is a tool for burnout measurement and it is composed in total of 19 items and 3 sections of (i) personal (6 items), (ii) work-related (7 items), and (iii) client-related burnout (6 items). There are multiple questions for each of these subscales and the responses are in the form of either always, often, sometimes, seldom, and never/almost never or to a very high degree, to a high degree, somewhat, to a low degree, and to a very low degree. The response options are recoded into scores of 100, 75, 50, 25, and 0 with one item reverse scored. Higher scores indicate a higher degree of burnout. We averaged the scores as the total score and defined burnout as a CBI score >50. The version of the tool used was the one translated and validated in the Greek language with a Cronbach's alpha index value of 0.84 [19] (Table **1**).

### 2.6. Statistical Analysis

Descriptive statistics was performed using mean and SD, and frequencies and percentages where appropriate. An analysis of descriptive statistics was conducted to illustrate the demographic characteristics, level of burnout, and resilience of the participants. The internal consistency of the scales used was assessed by calculating Cronbach's alpha. The chi-square test was used to explore the existence of a statistically significant relationship between the categorical variables. The t-test was used to assess whether the means of the two groups were statistically different from each other, while for the comparison of the aforementioned scores between three or more groups, analysis of variance (ANOVA) was used (the dependent variable was assumed to be normally distributed in the population). A statistically significant difference was accepted at a p-value of less than 5%. All analyses, including descriptive statistics and inferential statistics, were carried out using Microsoft Excel and Stata ("Stata: Data Analysis and Statistical Software").

### 2.7. Ethical Consideration

The study was approved by the Cyprus Bioethics Committee with approval number "EEBK ΕΠ 2020 01 37".

## 3. RESULTS

### 3.1. Demographic Characteristics of Participants

A total of 470 nurses completed the survey. The majority of participants were women (73.6%). The most common (56.81%) age group among participants was 30-45 years of age. 56.2% of the participants had a bachelor's degree in nursing and 43% of them were having a postgraduate certificate (MSc or PhD). More than half of the nurses (55.32%) had more than 10 years' work experience. Approximately 28% of the nurses were working as front-line nurses (either COVID unit, emergency department, or ICU). Most of the participants worked in public hospitals (72%) and were from Nicosia (59.57%). 69.1% of them were married. The demographics of the responders is presented in Table **2**.

**Table 1. Results of the CBI and CDRISK25 questionnaires.**

| CBI Question | Always or to a Very High Degree (Scoring 100) % | Often or to a High Degree (Scoring 75) % | Sometimes or Somewhat (Scoring 50) % | Seldom or to a Low Degree (scoring 25) % | Never/almost Never or to a Very Low Degree (Scoring 0) % | Missing | Mean (SD) | Burnout % (n) | CDRISK 25 | Mean Score (SD) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Personal burnout** | - | | | | | | | 68.30 (321) | Able to adapt to change | 2.833 (1.027) |
| How often do you feel tired? | 10.66 | 55.22 | 29.00 | 4.69 | 0.43 | 1 | 67.75 (18.35) | - | Close and secure relationships | 2.946 (0.877) |
| How often are you physically exhausted? | 6.81 | 51.06 | 30.43 | 10.43 | 1.28 | 0 | 62.93 (20.48) | - | Sometimes fate or God can help | 2.387 (1.181) |
| How often are you emotionally exhausted? | 8.55 | 49.57 | 30.56 | 10.26 | 1.07 | 2 | 63.57 (20.74) | - | Can deal with whatever comes | 2.985 (0.804) |
| How often do you think: "I can't take it anymore?" | 3.44 | 31.40 | 32.90 | 23.01 | 9.25 | 5 | 49.19 (25.62) | - | Past success gives confidence for new challenges | 3.111 (0.849) |
| How often do you feel worn out? | 7.26 | 36.11 | 29.70 | 21.37 | 5.56 | 2 | 54.54 (25.67) | - | See the humorous side of things | 2.823 (0.969) |
| How often do you feel weak and susceptible to illness? | 5.13 | 26.71 | 33.33 | 26.50 | 8.33 | 2 | 48.45 (25.82) | - | Coping with stress strengthens | 2.725 (1.022) |
| Total average score | - | | | | | | 57.75 (24.14) | - | Tend to bounce back after illness or hardship | 2.86 (0.893) |

*(Table 1) contd.....*

| CBI Question | Always or to a Very High Degree (Scoring 100) % | Often or to a High Degree (Scoring 75) % | Sometimes or Somewhat (Scoring 50) % | Seldom or to a Low Degree (scoring 25) % | Never/almost Never or to a Very Low Degree (Scoring 0) % | Missing | Mean (SD) | Burnout % (n) | CDRISK 25 | Mean Score (SD) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Work-related burnout** | - | | | | | | | 66.81 (314) | Things happen for a reason | 2.836 (1.084) |
| Is your work emotionally exhausting? | 22.44 | 40.38 | 26.28 | 8.97 | 1.92 | 2 | 68.11 (24.28) | - | Best effort no matter what | 3.328 (0.808) |
| Do you feel burnt out because of your work | 17.77 | 37.04 | 26.98 | 13.06 | 5.14 | 3 | 62.31 (27.1) | - | You can achieve your goals | 2.979 (0.832) |
| Is your job an obstacle? | 8.1 | 22.81 | 32.62 | 23.67 | 12.79 | 1 | 47.44 (28.4) | - | When things look hopeless, I don't give up | 2.923 (0.954) |
| Do you feel worn out at the end of the working day? | 7.91 | 41.45 | 32.48 | 15.6 | 2.56 | 2 | 59.13 (23.13) | - | Know where to turn for help | 2.777 (1.056) |
| Are you exhausted in the morning at the thought of another day at work? | 7.26 | 26.92 | 36.97 | 20.94 | 7.91 | 2 | 51.18 (26.02) | - | Under pressure, focus and think clearly | 2.732 (0.977) |
| Do you feel that every working hour is tiring for you? | 5.11 | 20.21 | 36.38 | 26.38 | 11.91 | 0 | 45.05 (26.31) | - | Prefer to take the lead in problem-solving | 2.687 (0.929) |
| Do you have enough energy for family and friends during your leisure time? | 8.74 | 29.85 | 40.51 | 18.55 | 2.35 | 1 | 56.02 (23.34) | - | Not easily discouraged by failure | 2.656 (0.908) |
| Total average score | - | | | | | | 55.61 (17.9) | - | Think of self as a strong person | 2.963 (0.93) |
| **Patient-related burnout** | - | | | | | | | 32.77 (154) | Make unpopular or difficult decisions | 2.702 (0.92) |
| Do you find it hard to work with patients? | 1.71 | 11.51 | 27.29 | 35.18 | 24.31 | 1 | 32.78 (25.41) | - | Can handle unpleasant feelings | 2.663 (0.884) |
| Do you find it disappointing to work with patients? | 0.86 | 6.03 | 18.75 | 36.85 | 37.5 | 6 | 23.98 (23.45) | - | Have to act on a hunch | 2.716 (0.893) |
| Does it drain your energy to work with patients? | 6.84 | 25.64 | 25.64 | 25 | 16.88 | 2 | 45.14 (29.76) | - | Strong sense of purpose | 2.868 (0.92) |
| Do you feel that you give more than you get back when you work with patients? | 13.89 | 26.07 | 22.86 | 21.37 | 15.81 | 2 | 50.21 (32.23) | - | In control of your life | 2.831 (0.95) |
| Are you tired of working with patients? | 1.92 | 10.23 | 31.34 | 30.49 | 26.01 | 1 | 32.89 (25.69) | - | I like challenges | 2.708 (1.018) |
| Do you sometimes wonder how long you will be able to continue working with patients? | 8.78 | 18.84 | 29.76 | 23.77 | 18.84 | 3 | 43.74 (30.29) | - | You work to attain your goals | 3.06 (0.903) |
| Total average score | - | - | - | - | - | - | 38.19 (21.71) | - | Take pride in your achievements | 2.952 (1.049) |
| | - | | | | | | | | Total | 70.279 (16.51) |

**Table 2. Burnout and resilience based on demographics.**

| Independent Variable | | N (%) | Burnout (50 Cutoff) | Resilience |
|---|---|---|---|---|
| Gender | Male | 124 (26.38) | X2 1.995 (DF1)<br>p=0.158 | t=-0.174<br>p=0.862 |
| | Female | 346 (73.62) | | |
| Age | <30 | 111 (23.62) | X2 1.408 (DF3)<br>p=0.704 | Annova p=0.013 |
| | 30-45 | 267 (56.81) | | |
| | 46-55 | 64 (13.62) | | |
| | >55 | 28 (5.96) | | |
| Work experience | <5 | 72 (15.32) | $X^2$ 0.144 (DF2)<br>p=0.931 | Annova p=0.088 |
| | 5-10 | 138 (29.36) | | |
| | >10 | 260 (55.32) | | |
| Sector | Public | 336 (71.95) | $X^2$ 5.691 (DF1)<br>p=0.017<br>OR (95%CI)= 0.611 (0.41-0.92) | t=-1.159<br>p=0.247 |
| | Private | 131 (28.05) | | |
| Department | COVID unit | 132 (27.66) | $X^2$ 5.500 (DF1)<br>p=0.019<br>OR (95%CI)= 1.63 (1.08-2.47) | t=0.508<br>p=0.612 |
| | Non COVID unit | 338 (72.44) | | |
| Location/District | Nicosia | 280 (59.57) | X2 10.2104 (DF4)<br>p=0.037 | Annova p=0.602 |
| | Limassol | 97 (20.64) | | |
| | Ammochostos | 35 (7.45) | | |
| | Larnaca | 28 (5.96) | | |
| | Pafos | 30 (6.38) | | |

### 3.2. Burnout

The results of the CBI questionnaire exhibited an excellent internal consistency (Cronbach's α 0.94). Overall, 54.26% of the responders were classified as experiencing burnout (burnout=>50% on the questionnaire). Table **1** shows the breakdown of the responses of the nurses based on the CBI tool. The mean (SD) scores of the personal, work-related, and patient-related burnout domains of the questionnaire were 57.75 (24.14), 53.87 (27), and 38.38 (28.67).

As expressed by the questionnaire (> mean score of 50), 68.30% (321) accounted for personal burnout, while work-related burnout was 66.81% (314). Respondents who were experiencing patient-related burnout accounted for 32.77% (154) (Table **1**).

### 3.3. Connor-davidson Resilience Scale

The results of the CDRISK-25 questionnaire exhibited an excellent internal consistency (Cronbach's α 0.95). The respondents' answers to the CD-RISC-25 questions were examined item by item, and are reported in Table **1**. The lowest mean (SD) score was Q3 (2.39, SD 1.18) that focused on spirituality and religion, followed by Q16 (2.66, SD 0.91), which examined discouragement due to failure; the highest score (Q10: 3.32, SD 0.81) was expressed by draining confidence from positive experiences (Q5 3.11 SD 0.85) on trying your best at any consequence. The total score (average) was obtained by adding up all 25 items and dividing the sum by the number of respondents. In the sample of all respondents, the total mean score was 70.28 (SD 16.51), and the median (IQR) was 73(20). In almost half of the respondents (48.51%), the total score was ≤ 72.

### 3.4. Factors Associated with Burnout and Resilience

Factors that may affect burnout have also been examined, and the results are provided in Table **2**. The analysis indicated no statistically significant association between age, gender, marital status, academic qualification, or work experience. The sector the participants worked in terms of location and department (COVID *vs.* non-COVID) exhibited a statistically significant difference between the relevant groups for burnout (p=0.017, p=0.037, and p=0.019, respectively). Nurses in the private sector had less chances of experiencing burnout. Working in the COVID unit had significantly (p<0.05) higher odds of experiencing burnout. There was no statistically significant indication of mean CDRISK being different between males and females (p=0.862). The variables investigated for their significance in relationship with resilience metrics were found to be statistically not significant (p>0.05). Only statistical significance was observed between the three different groups of age (p=0.0126). Further analysis to determine which groups differed from each other, using the Bonferroni adjustment, indicated a statistically significant difference in CDRISK between the 46-55 *vs*. <30 (p=0.016) and 46-55 *vs.* 30-45 (p=0.012) age groups.

### 3.5. Intention to Leave

Overall, the majority of responders stated that they did not intend to change departments (61.72%), hospitals (57.57%), or profession (62.81%) (Table **3**). In-depth analysis of the intention to change departments, hospital, or jobs revealed a statistically significant difference between those who were classified as experiencing burnout. Moreover, more resilient participants had statistically significantly lower odds ratios for their desire of changing their department, hospital, or job.

**Table 3. Intention to leave based on demographics, burnout, and resilience.**

| Demographics | | Department | | | Organisation | | | Profession | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes (%) | No (%) | - | Yes (%) | No (%) | - | Yes (%) | No (%) | - |
| Gender | Male | 41.59 | 58.41 | $X^2$ (df1): 0.710 P:0.399 | 44.83 | 55.17 | $X^2$ (df1): 0.342 P:0.559 | 46.15 | 53.85 | $X^2$ (df1): 5.4382 P:0.020 |
| | Female | 37.11 | 62.89 | | 41.69 | 58.31 | | 34.04 | 65.96 | |
| Age | <30 | 45.92 | 54.08 | $X^2$ (df3): 6.295 P:0.098 | 50.49 | 49.51 | - | 44.23 | 55.77 | Fisher's P<0.001 |
| | 30-45 | 36.39 | 63.31 | | 42.91 | 57.09 | | 41.31 | 58.69 | |
| | 46-55 | 40 | 60 | | 37.29 | 62.71 | | 21.31 | 78.69 | |
| | >55 | 20 | 80 | | 19.23 | 80.77 | | 4 | 96 | |
| Work experience | <5 | 50.79 | 49.21 | $X^2$ (df2): 5.464 P:0.065 | 58.73 | 41.27 | $X^2$ (df2): 7.934 P:0.019 | 41.43 | 58.57 | $X^2$ (df2): 4.340 P:0.111 |
| | 5-10 | 38.76 | 61.24 | | 40.30 | 59.70 | | 43.08 | 56.92 | |
| | >10 | 34.73 | 65.27 | | 39.50 | 60.50 | | 32.93 | 67.07 | |
| Sector | Public | 36.63 | 63.38 | $X^2$ (df1): 1.277 P:0.259 | 37.94 | 62.06 | $X^2$ (df1): 9.821 P:0.002 | 37.89 | 62.11 | $X^2$ (df1): 0.222 P:0.638 |
| | Private | 42.61 | 57.39 | | 54.55 | 45.45 | | 35.48 | 64.52 | |
| Burnout | Yes | 51.74 | 48.26 | $X^2$ (df1): 37.795 P:<0.001 | 50.22 | 49.78 | $X^2$ (df1): 11.699 P:0.001 | 54.07 | 45.93 | $X^2$ (df1): 66.299 P:<0.001 |
| | No | 22.89 | 77.11 | | 33.98 | 66.02 | | 16.75 | 83.25 | |
| CDRISK | - | Mean 66.80 SD 16.95 | Mean 72.88 SD 15.98 | OR 0.978 (95% CI 0.966-0.990) | Mean 67.97 SD 16.79 | Mean 72.46 SD 15.90 | OR 0.983 (95% CI 0.972-0.995) | Mean 66.08 SD 15.81 | Mean 72.89 SD 16.30 | OR 0.975 (95% CI 0.963-0.987) |
| Total | - | 38.28 | 61.72 | - | 42.53 | 57.47 | - | 37.19 | 62.81 | - |

## 4. DISCUSSION

This study aimed to estimate the prevalence of burnout and resilience among nurses in Cyprus during the COVID-19 pandemic. The results showed a high prevalence of burnout among nurses, which may be related to personal and work burnout but importantly not related to patients. The increase in the prevalence of burnout was found to be related to work in public hospitals rather than in private hospitals, the city of work, and the department of work. In addition, nurses experiencing burnout demonstrated a higher tendency to leave their department/organization and jobs. However, nurses in Cyprus tend to have high resilience.

The different phases or waves of the pandemic have also caused different impacts on healthcare professionals in terms of the occurrence of burnout. The first wave of the pandemic in 2020 had a small effect on the prevalence of burnout among Cypriot nurses [20, 21] compared to other countries, such as China [22], Japan [23], Iran [24], and Italy [25]. However, a recent study conducted in Cyprus, during the first wave, showed the pandemic to have a different impact on health professionals. The greatest impact of the pandemic on workers' mental health was found among nurses, who had twice the rates of anxiety and depression than observed in doctors [21]. Though the prevalence of burnout among Cypriot nurses during the first wave of the pandemic was found to be significantly reduced to 14.1% [21] compared to an earlier study where the prevalence of burnout among Cypriot nurses was found to be 12.8%, almost 92% of nurses indicated fatigue regardless of the workplace [26]. However, both surveys used a different tool for measuring burnout in comparison to the one we used, the Maslach Burnout Inventory.

During the second wave of the pandemic, several studies have shown nurses to experience emotional exhaustion and psychological stress associated with various factors, such as age, gender, poor mental health, and also work-related factors, including increased workload, long working hours, fear of infection, as well as insufficient protection equipment [27, 28]. In addition, a large percentage of nurses experienced posttraumatic stress seeking emotional and psychological support [29]. Throughout the third wave, in which this study was conducted, it appeared that nurses had reached the limits of their endurance or even exceeded them in many European countries. According to the results of this study in comparison to earlier studies [21], it seems that between the first and third wave of the pandemic, the prevalence of burnout has quadrupled.

### 4.1. Implications for Nursing and Health Policy

The need to prevent the collapse of the health system has led to the restructuring of health services in many countries around the world [30]. In Cyprus, the Famagusta General Hospital was designated as a reference hospital for the treatment of patients with COVID-19, while in cases where patients needed hospitalization in an intensive care unit, they had to be transferred to the two major General Hospitals of Nicosia or Limassol. At the same time, in all state hospitals of Cyprus, treatment wards were set up for suspected and confirmed cases of COVID-19 infection [21, 31]. As a result, only the public hospitals in Cyprus absorbed all burden of treating patients with COVID-19, while the private hospital did not participate in the treatment of patients with COVID-19. This fact probably explains why private hospital nurses had lower burnout rates compared to public hospital nurses. Evidence from previous pandemics, such as the SARS epidemic in 2003, indicates that there is an increased rate of burnout and post-traumatic stress disorder among healthcare professionals who are directly involved in treating patients compared to those not treating patients affected by the epidemic [32].

In Cyprus, before the third wave of the COVID-19 pandemic, the number of beds available in the ICU increased

from 28 to 54, raising the need for nursing staff. The Ministry of Health planned the reallocation of nurses from other departments of public hospitals to the ICU, a fact that brought the necessity of increasing working hours but also that exhibited a lack of expertise as the ICU is a more specialized unit. This poses a significant opportunity for continuing professional development and lifelong learning for educational and vocational institutions as there is an obvious need for specialized courses focused on managing critically ill patients and also developing soft skills courses, such as stress management, compassionate care provision, as well as ensuring self-care. It should be noted that the number of Cypriot nurses per 1000 inhabitants is below the European Union average [33]. This may be attributed to the increased possibility of work-related stress, while at the same time, augmented workload in the understaffed non-COVID departments always having in mind that caring for critically ill patients is an already stressful process [34].

Moving nurses from other wards, making new ICUs, as well as inexperience in caring for those seriously ill, may have contributed to the increased burnout among nurses working in COVID wards. An additional possible explanation could be that, in Cyprus, there are no assistant nurses or healthcare assistants, so as a result, the burden of care falls exclusively on nurses. Published research focusing on the role of healthcare assistants shows the value of their contribution to the care of patients. Specifically, nurses can be decongested from daily practical care, such as bathing and dressing the patient, which may allow them to focus on therapeutic work and more appropriate use of their skills [35].

Research from different countries, such as Egypt [36] and the Philippines [37], mentions that this pandemic has caused a plethora of negative consequences that have been found to strongly affect nurses and their intention to leave. A poor work environment, understaffing, and conflict nursing duties are the major factors that may push nurses to quit their jobs [38]. In our study, the intention to change the department or even leave the profession was related to burnout. Emotional and physical fatigue, work stress, low pay as well as various difficulties in combining and balancing work with personal life, have been found to be factors associated with burnout and the tendency to leave the profession [39]. On the contrary, working in a better work environment has been found to reduce burnout levels and the intention to retire [40], while in untreated cases, this can lead health professionals to retire or even retire early.

Regarding the resilience results, they have been found to be similar to those of Abram and Jacobowitz's study, which have shown a significant inverse relationship between resilience and burnout in both the professional nurse and student nurse groups. Specifically, the research has suggested that resilience to burnout is not related to the work environment, but to life experience (age), which has been found to be a factor related to resilience [10]. Moreover, previous research shows that nurses' spiritual outlook could be a significant asset in coping with the COVID-19 pandemic, thus highlighting the significant effect of spirituality and religion on nurses in the Middle East Region. Religion, spirituality, and personal beliefs could be a source of power and strength that could mitigate the negative stressors of work and life [41]. In this study, Cypriot nurses showed a high level of resilience with a total mean of 70.28, and this may have to do with the high spiritual levels and religious beliefs of the nurses. On the other hand, the strong commitment of Cypriot nurses to their patients and their duties made the nurses give their best effort no matter what, an item that had the highest mean score in the resilience questionnaire. The increased level of resilience among Cypriot nurses in association with the low levels of burnout, strengthens this result, showing Cypriot nurses to have good relationships with patients and the nature of their work regardless of whether they are exhausted from their working conditions.

## 5. LIMITATIONS

This study has several limitations that need to be acknowledged. This was a cross-sectional study in which etiological relationships cannot be supported. The data collection was done online without being able to determine the sample. This could introduce some biased selection. In addition, most of the participants were nurses working in non-COVID units, as well as belonged to the biggest hospitals in the capital. The study population may have had other confounding factors that may have affected the outcomes, such as depression and overtime work, which were not studied in the present study. The study was conducted at a specific time during the third wave of the pandemic in Cyprus, so the generalization of the results requires special attention.

## CONCLUSION

The current pandemic indicates a need for better preparation for any future crisis. Many world and national leaders have been taken by surprise by the rapidness and destructive efficiency of COVID-19. But as proven over time, nurses responding to populations in crisis have learned not to rely on front-line resources and protection or early warning or openness about contagion risk, case numbers, and data outcomes.

During the third wave of the pandemic, a high percentage of nurses have been found to experience burnout, but this has not been related to patients. Through the difficulties brought by the pandemic, it appears that the nurses have managed to have resilience. However, burnout has appeared as a threat for nurses. The intention to leave the profession due to burnout can have profound consequences for the quality of nursing care that is provided. Even though burnout is a major research topic in the health system, little has been done in the context of health professionals, specifically nursing education. This was the first time that such a study evaluating resilience and burnout among nurses during a crisis situation in the health system (*e.g.*, the third wave of COVID-19) has been performed in Cyprus. The results presented in this paper may provide the foundation for measures to be taken both from administrative/managerial and educational partners for improving the existing situation that may stress the health system and lead to negative consequences caused by burnout.

## LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| **PPE** | = | Personal Protective Equipment |
| **CYNMA** | = | Cyprus Nursing and Midwifery Association |
| **CD-RISC** | = | Connor–Davidson Resilience Scale-25 |
| **CBI** | = | Copenhagen Burnout Inventory |

## AUTHORS' CONTRIBUTIONS

IL and MP conceived the idea, and collaborated with their colleagues, AUB, MP, IL, NS, and AP, in designing the study. NS analysed the data. NS, AP, MP, and IL wrote the manuscript. NS, MP, IL, and AP critically revised the manuscript for important intellectual content.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the *Cyprus Bioethics Committee* with approval number "ΕΕΒΚ ΕΠ 2020 01 37".

## HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee, and with the 1975 Declaration of Helsinki, as revised in 2013.

## CONSENT FOR PUBLICATION

Participation in the study was fully voluntary and non-commercial, and all responses were anonymous. The online questionnaire was kept open between March 2021-April 2021, and the data were collected anonymously with no personally identifiable characteristics.

## STANDARDS OF REPORTING

COREQ guidelines were followed.

## AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article. The data were collected for the purpose of this study. For any other use the Cyprus National Bioethics Committee needs to be asked.

## FUNDING

None.

## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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