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Article

Resilience and Social Support Protect Nurses from Anxiety and Depression: Evidence from Greece in the Post-COVID-19 Era

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Abstract: Background: Nurses experience high levels of anxiety and depression since they work in a high stressful environment. Thus, identification of preventive factors against nurses' anxiety and depression is essential to improve their quality of life. In this context, our aim was to examine the impact of resilience and social support on nurses' anxiety and depression. Methods: A cross-sectional online study was implemented in Greece during September 2024. We used the Brief Resilience Scale, the Multidimensional Scale of Perceived Social Support and the Patient Health Questionnaire-4 to measure resilience, social support, anxiety and depression, respectively. Results: Our sample included 677 nurses with a mean age of 37.73 years (standard deviation; 9.38). Our multivariable linear regression models identified a negative relationship between resilience and anxiety (b=-0.94, 95% confidence interval (CI)=-1.11 to -0.77, p<0.001) and depression (b=-0.88, 95% CI=-1.05 to -0.71, p<0.001). Similarly, we found that significant others support was associated with reduced anxiety (b=-0.30, 95% CI=-0.43 to -0.18, p<0.001) and depression (b=-0.24, 95% CI=-0.37 to -0.12, p<0.001). Conclusions: Our findings suggest the protective role of resilience and social support against nurses' anxiety and depression. Managers and policy makers should adopt appropriate interventions to improve nurses' resilience and social support, and, thus, to improve their mental health and quality of life.

Keywords: resilience; social support; anxiety; depression; nurses

1. Introduction

Healthcare systems rely heavily on nurses, who provide crucial care and assistance to patients and their families [1,2]. However, the nursing profession is fraught with factors that can negatively affect mental well-being, including high-stress environments, excessive workloads, extended shifts, irregular sleep patterns, exposure to traumatic events, emotional demands, and insufficient support [3–6]. Consequently, nurses often experience elevated levels of anxiety, depression, stress, trauma, and burnout. The consequences of nurse depression and anxiety are far-reaching, affecting both individuals and organizations. These conditions can compromise the quality and safety of patient care, elevate the likelihood of errors and adverse events, diminish patient satisfaction, and contribute to increased staff turnover and absenteeism [7–10].

The COVID-19 pandemic has further exacerbated these challenges, presenting nurses with numerous obstacles that continue to affect their work quality and mental well-being. For example, global nurse staffing shortages, intensified by pandemic-related sick leaves due to SARS-CoV-2 infections, have significantly worsened the pre-existing nursing personnel deficit. This has resulted in increased workloads for active nurses [11–13]. As a result, nurses during the pandemic have experienced high levels of burnout and various mental health issues [14,15]. In particular, two recent meta-analyses including studies during the COVID-19 pandemic showed high levels of anxiety and

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depression among nurses [16,17]. Al Maqbali et al. identified 93 studies including 92,112 nurses and found that the overall prevalence of anxiety and depression was 37% and 35%, respectively [16]. Also, Ślusarska et al. identified 23 studies from nine countries and found that the overall prevalence of anxiety and depression among 44,165 nurses was 29% and 22%, respectively [17]. Similarly, an umbrella review of seven meta-analyses found that the overall prevalence of anxiety and depression among healthcare workers was 24.9% and 24.8%, respectively [18].

Resilience is typically described as the capacity to handle challenging life events, including stress, trauma, threats, and tragedy [19]. It involves the ability to bounce back swiftly from adversity and difficult circumstances [20]. Experts view resilience as a dynamic, evolving psychosocial process through which individuals facing prolonged hardship or potentially harmful experiences achieve positive psychological adaptation over time. This quality serves as a protective factor for both mental and physical well-being, enhancing one's ability to effectively manage adversity and stressful situations. Rather than being solely an individual trait, resilience involves the interaction between internal and external environmental elements [21]. Literature has demonstrated that people with higher levels of resilience are better equipped to shield themselves from psychiatric disorders [22–24]. Numerous early studies have highlighted the preventative effect of resilience on symptoms of anxiety and depression across various groups, including cardiovascular disease patients, healthcare professionals, clinical nurses, university students, and pregnant women [23,25–28].

The concept of social support encompasses the presence or accessibility of individuals on whom one can depend and from whom one can experience affection, nurturing, and appreciation. In essence, it refers to the actual or perceived external resources an individual can access through their network of friends, family members, romantic partners, and colleagues [29,30]. Social support manifests in various forms, including structural, functional, emotional, instrumental/material, and informational types [31]. Social support plays a crucial role in safeguarding mental well-being. For example, it serves as a key protective factor against depression by fostering positive social connections and indirectly shielding individuals from stress [32,33]. Furthermore, high levels of social support have been shown to have a protective effect against post-traumatic stress disorder and burnout [34,35].

The importance of resilience and social support in nurses' mental health emerged during the COVID-19 pandemic. In particular, several studies during the COVID-19 pandemic showed that resilience plays a protective role against anxiety [36–38] and depression [23,36,38–40]. However, all these studies were conducted only in Asian countries, such as China [37], South Korea [39,40], Iran [36], Taiwan [38] and Turkey [23]. Similarly, five other studies in Asian countries (four in China and one in Japan) showed a negative association between social support, anxiety, and depression [35,41–44]. However, after the end of the COVID-19 pandemic, no further studies were carried out to investigate the association between resilience, social support, anxiety and depression. Additionally, the literature on the impact of resilience and social support on nurses' anxiety and depression in Europe is very limited. In this context, our aim was to investigate the impact of resilience and social support on anxiety and depression in a sample of nurses in Greece.

2. Materials and Methods

2.1. Study Design

A cross-sectional online study was implemented in Greece during September 2024. We applied the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) guidelines [45]. We used Google forms to create a digital version of the study questionnaire, which was subsequently distributed through Facebook groups for nurses. Thus, we obtained a convenience sample. Participants were required to meet the following criteria: 1) be a practicing nurse in healthcare facilities such as hospitals, health centers, or nursing homes, 2) have a minimum of one year work experience, and 3) provide written informed consent for study participation. No compensation was offered to those who took part in the study.

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We used G*Power v.3.1.9.2 to calculate our sample size. In our study, we considered two predictors (resilience and social support) and five confounders (gender, age, educational level, work experience, and self-assessment of health status). In this context, considering an anticipated effect size of 0.02 between resilience (or social support) and outcomes (anxiety, depression), a statistical power of 95%, and a margin of error of 5%, the sample size was estimated to be 652 nurses.

2.2. Measurements

We measured the following demographic characteristics of nurses: gender (females or males), age (years), MSc/PhD diploma (no or yes), work experience (years), and self-assessment of health status (very poor, poor, moderate, good or very good).

We used the Brief Resilience Scale (BRS) [46] to measure nurses' resilience. The BRS includes six items, e.g. "I have a hard time making it through stressful events" and "I usually come through difficult times with little trouble". Answers are on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Score on the BRS is calculated as an average of all answers, and, thus, total score ranges from 1 to 5. Higher scores indicate higher level of resilience. We used the valid Greek version of the BRS [47]. In our study, Cronbach's alpha for the BRS was 0.804.

We used the Multidimensional Scale of Perceived Social Support (MSPSS) [48] to measure levels of social support among our nurses. In particular, we used the valid Greek version of the MSPSS [49]. The MSPSS includes 12 items, and measures three dimensions of social support: family support (e.g., "My family really tries to help me"); friends support (e.g., "I can count on my friends when things go wrong"); significant others support (e.g., "There is a special person who is around when I am in need"). Answers are on a seven-point Likert scale from 1 (very strongly disagree) to 7 (very strongly agree). Score on each factor ranges from 1 to 7 with higher scores to be indicative of higher levels of support. In our study, Cronbach's alpha for the factors "family support", "friends support", and "significant others support" was 0.952, 0.954, and 0.922, respectively.

We used the Patient Health Questionnaire-4 (PHQ-4) [50] to measure levels of anxiety and depression in our sample. The PHQ-4 includes two items that measure anxiety (i.e., "Over the last 2 weeks, how often have you been feeling nervous, anxious or on edge?", and "Over the last 2 weeks, how often have you been not being able to stop or control worrying?"), and two items that measure depression (i.e., "Over the last 2 weeks, how often have you been feeling little interest or pleasure in doing things?", and "Over the last 2 weeks, how often have you been feeling down, depressed, or hopeless?"). Answers are on a four-point Likert scale from 0 (not at all) to 3 (nearly every day). Score on anxiety and depression scales range from 0 to 6. Higher scores are indicative of higher levels of anxiety and depression. Total score ≥3 for each factor suggests anxiety and depressive symptoms. We used the valid Greek version of the PHQ-4 [51]. In our study, Cronbach's alpha for the factors "anxiety" and "depression" was 0.827 and 0.769, respectively.

2.3. Ethical Issues

Our study protocol received approval from the Ethics Committee of the Faculty of Nursing at the National and Kapodistrian University of Athens (approval number; 476, approved: November 2023). Moreover, our study adhered to the principles of the Declaration of Helsinki [52]. In the first page of the questionnaire the purpose of the study and use of data were explained. Participants were also informed that survey should take 8 minutes approximately for its completion, whilst their consent was granted upon its completion. Survey's completion was voluntary and anonymous. Participants had the right to withdraw from the study any time during data collection. We did not collect personal data from nurses.

2.4. Statistical Analysis

We present categorical variables with numbers and percentages. Also, we present continuous variables with mean, standard deviation (SD), median, minimum value and maximum value. Resilience, family support, friend support and significant others support were the independent

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variables, while anxiety and depression were the dependent variables. Anxiety and depression scores were continuous variables that followed normal distribution. Thus, we applied linear regression analysis. First, we performed univariate linear regression analysis between independent variables and anxiety and depression. Then, we constructed two multivariable linear regression models with anxiety and depression as the dependent variables. We adjusted our multivariable models for gender, age, educational level, work experience, and self-assessment of health status. We calculated unadjusted and adjusted coefficients beta, 95% confidence intervals (CI), and p-values. P-values less than 0.05 were considered as statistically significant. We used the IBM SPSS 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.) for the analysis.

3. Results

3.1. Demographic Characteristics

Study population included 677 nurses. Mean age of nurses was 37.73 years (SD; 9.38) with a median age of 37 years (range; 42). Most of nurses were females (89.4%). More than half of our sample possessed a MSc/PhD diploma (54.4%). Among our nurses, 89.7% considered their health status as good/very good, 6.2% as moderate, and 4.2% as poor/very poor. Mean work experience was 11.59 years (SD; 8.95) with a median of 10 years (range; 35). Demographic characteristics of nurses are shown in Table 1.

Table 1. Demographic characteristics of nurses (N=677).

Characteristics	N	%
Gender		
Males	72	10.6
Females	605	89.4
Age (years)[a]	37.73	9.38
MSc/PhD diploma		
No	309	45.6
Yes	368	54.4
Self-assessment of health status		
Very poor	18	2.7
Poor	10	1.5
Moderate	42	6.2
Good	411	60.7
Very good	196	29.0
Work experience (years)[a]	11.59	8.95

[a] mean, standard deviation.

3.2. Study Scales

Mean resilience score was 3.45 (SD; 0.65) indicating a moderate level of resilience among our nurses. Levels of social support were high in our sample. In particular, we found that our nurses received higher levels of significant others support (mean, 6.02, SD; 1.46) and family support (mean, 5.94, SD; 1.51) rather than friends support (mean, 5.77, SD; 1.47). Mean anxiety score was 2.35 (SD; 1.62), while mean depression score was 2.15 (SD; 1.58). Among our nurses, 38.0% (n=257) had an anxiety score of 3 or greater that suggested anxiety symptoms. Moreover, 32.6% (n=221) of our nurses had depression score ≥3 that was indicative of depressive symptoms.

Table 2. Descriptive statistics for the study scales (N=677).

Scale	Mean	Standard deviation	Median	Minimum value	Maximum value
Resilience	3.45	0.65	3.5	1	5

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Family support	5.94	1.51	6.5	1	7
Friends support	5.77	1.47	6.3	1	7
Significant others support	6.02	1.46	6.5	1	7
Anxiety	2.35	1.62	2.0	0	6
Depression	2.15	1.58	2.0	0	6

3.3. Impact of Resilience and Social Support on Anxiety and Depression

Our multivariable linear regression analysis showed that resilience and social support reduce nurses' anxiety (Table 3). After adjustment for gender, age, educational level, work experience, and self-assessment of health status we found a negative relationship between resilience and anxiety (b=-0.94, 95% CI=-1.11 to -0.77, p<0.001). Additionally, we found that significant others support is an independent preventive factor of anxiety (b=-0.30, 95% CI=-0.43 to -0.18, p<0.001). The other two dimensions of social support (family and friends support) were statistically significant predictors of anxiety in the univariate models but they were not in the final multivariable model.

We found similar finding regarding the impact of social support on anxiety and depression. In particular, our multivariable linear regression model identified a negative relationship between resilience (b=-0.88, 95% CI=-1.05 to -0.71, p<0.001) and significant others support (b=-0.24, 95% CI=-0.37 to -0.12, p<0.001), and depression. Family and friends support were significant predictors of depression in the univariate linear regression models, but this relationship was eliminated after the multivariable analysis. Table 4 shows linear regression models with depression as the dependent variable.

Table 3. Linear regression models with anxiety as the dependent variable (N=677).

Independent variables	Univariate models			Multivariable model[a,b]		
	Unadjusted coefficient beta	95% CI for beta	P-value	Adjusted coefficient beta	95% CI for beta	P-value
Resilience	-1.12	-1.29 to -0.95	<0.001	-0.94	-1.11 to -0.77	<0.001
Family support	-0.30	-0.38 to -0.23	<0.001	0.05	-0.07 to 0.17	0.389
Friends support	-0.29	-0.37 to -0.21	<0.001	-0.05	-0.16 to 0.05	0.299
Significant others support	-0.39	-0.47 to -0.32	<0.001	-0.30	-0.43 to -0.18	<0.001

[a] Multivariable model is adjusted for gender, age, educational level, work experience, and self-assessment of health status. [b] R^2 for the multivariable model = 29.1%, p-value for ANOVA < 0.001. CI: confidence interval.

Table 4. Linear regression models with depression as the dependent variable (N=677).

Independent variables	Univariate models			Multivariable model[a,b]		
	Unadjusted coefficient beta	95% CI for beta	P-value	Adjusted coefficient beta	95% CI for beta	P-value
Resilience	-1.04	-1.21 to -0.88	<0.001	-0.88	-1.05 to -0.71	<0.001
Family support	-0.30	-0.38 to -0.23	<0.001	0.001	-0.11 to 0.12	0.992
Friends support	-0.29	-0.37 to -0.21	<0.001	-0.05	-0.15 to 0.05	0.321
Significant others support	-0.37	-0.45 to -0.29	<0.001	-0.24	-0.37 to -0.12	<0.001

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[a] Multivariable model is adjusted for gender, age, educational level, work experience, and self-assessment of health status. [b] R^2 for the multivariable model = 26.1%, p-value for ANOVA < 0.001. CI: confidence interval.

4. Discussion

To the best of our knowledge this is the first study that examines the association between resilience, social support, anxiety and depression after the COVID-19 pandemic. Moreover, we investigated for first time the association between these variables in a European country and not only after the pandemic. We found that resilience and social support play a protective role against nurses' anxiety and depression. Moreover, our findings indicated that a significant percentage of nurses experience anxiety and depressive symptoms.

In particular, scores on PHQ-4 indicated that 38.0% of our nurses experienced anxiety symptoms, while 32.6% experienced depressive symptoms. Literature supports these findings since a meta-analysis including studies during the COVID-19 pandemic found that the overall prevalence of nurses' anxiety depression is 37% and 35%, respectively [16]. Also, a similar meta-analysis found slightly lower overall prevalence of anxiety and depression in nurses during the pandemic; 29% and 22%, respectively [17]. Additionally, an umbrella review of seven meta-analyses found that the overall prevalence of anxiety and depression among healthcare workers during the pandemic was 24.9% and 24.8%, respectively [18]. It is therefore clear that the high levels of anxiety and depression experience by nurses remain after the end of the pandemic. Indicatively, in studies conducted after the pandemic, the prevalence of anxiety ranged from 28.7% to 39.6%, while the prevalence of depression ranged from 13.6% to 52.1% [53–56]. The elevated prevalence of anxiety and depression among nurses can be attributed to their constant exposure to various stressors in their daily work environment. The COVID-19 pandemic has further exacerbated the already challenging working conditions for nurses. For example, many countries are now grappling with a widespread shortage of nursing staff. Furthermore, nurses' mental well-being is jeopardized by numerous factors, including overwhelming workloads, prolonged work hours, emotionally taxing situations, encounters with traumatic events, and disrupted sleep schedules [4–6,11–13].

Our findings indicated that resilience plays a protective role against nurses' anxiety and depression. Several studies during the COVID-19 pandemic confirmed that resilience is associated with reduced anxiety and depression among nurses [23,36–40]. In other words, nurses with higher resilience levels have fewer anxiety and depressive symptoms. Nurses who possess high levels of resilience are better equipped to combat stressors and mitigate their detrimental psychological effects. Additionally, resilience encourages nurses to accept and take on responsibilities, which in turn reduces burnout and improves their physical and mental well-being [57–60]. Consequently, resilience plays a crucial role in minimizing the negative impact of work-related stress and enhancing nurses' ability to adapt and thrive in challenging healthcare environments [61]. Resilience aids in diminishing and overcoming negative emotions such as anxiety and depression. On the other hand, nurses with low resilience struggle to effectively manage or control stress. Resilience helps to counteract or modify the adverse effects of unfavorable workplace conditions, enhances the psychological health of nursing staff, and improves the quality of care provided by nurses. Without resilience, nurses may experience poor working conditions, which can lead to psychological harm [62–66].

Our multivariable analysis identified social support as an independent predictor of anxiety and depression. In particular, we found that nurses receiving higher levels of social support have fewer anxiety and depressive symptoms. Similar studies in China and Japan confirm our findings since they found that social support reduce nurses' anxiety, and depression [35,41–44]. External resources that individuals perceive or actually have access to from their personal connections, including friends, family members, romantic partners, and colleagues, are referred to as social support. This support plays a crucial role in mental health, particularly for nurses, as it allows them to express their stressors and helps prevent or manage anxiety and depression [67]. Research has shown that social support is an effective tool for coping with stress, and individuals who receive such assistance are better equipped to handle the negative effects of stress [68]. Additionally, social support serves as a

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protective factor against anxiety and depression by fostering positive social relationships and indirectly shielding individuals from stress [32,33,66,69,70]. Furthermore, social support can be described as a network of psychological and material resources available to individuals as they cope with anxiety and depression [31]. In this context, nurses receive varying degrees of support from their family, friends, and significant others, which enables them to comprehend and value the challenges they face in balancing their work and personal life demands [41].

4.1. Limitations

Our study had several limitations. First, we employed a cross-sectional design to examine the association between resilience, social support, anxiety and depression. Therefore, we cannot establish causal relationships between these variables. Longitudinal studies are necessary to identify the association resilience, social support, anxiety, and depression through the time. Second, we obtained a convenience sample through a web-based survey. Thus, our sample was not representative of nurses in Greece. Although, we achieved the minimum required sample size we cannot generalize our findings. Future studies with random and stratified samples of nurses could add significant information. Third, we performed our study in a European country, and, thus, we cannot make inferences for nurses in other countries. Therefore, it is necessary to implement further studies worldwide to confirm our findings. Fourth, although we used valid tools to measure resilience, social support, anxiety and depression among nurses information bias is probable in our study since these tools are self-reported measurements. Fifth, we constructed our multivariable models by eliminating several confounders. However, several other variables may act as confounders in the association between resilience, social support, anxiety and depression. Future studies should eliminate more confounders to get more valid results.

5. Conclusions

Our findings suggest that higher levels of resilience and better social support result in less anxiety and depressive symptoms among nurses. Thus, resilience and social support can contribute to prevent and manage nurses' anxiety and depression. Nursing managers and policymakers should focus on identifying key groups for targeted interventions and provide comprehensive training to nurses. This training should aim to enhance their resilience, social support networks, and ability to manage workplace stressors. Additionally, initiatives should be developed to bolster resilience and social support, with particular emphasis on nurses working in high-risk units. It is essential for nurses to cultivate workplace resilience, especially during challenging and critical work situations, enabling them to transform negative experiences into positive ones. Implementing psychological empowerment strategies for nurses in hospital settings may contribute to reducing anxiety and depression while improving their resilience skills. By focusing on strengthening resilience and offering robust social support to nurses, healthcare organizations may effectively reduce the prevalence of anxiety and depression among these vital healthcare professionals.

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