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ORIGINAL PAPER

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Investigating Nurses Stress Response Strategies During the COVID-19 Pandemic

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ABSTRACT

Background: Stress response strategies are a conscious effort to solve personal and interpersonal problems, aiming to minimize stress. **Objective:** The aim of this study is to investigate the stress response strategies of nurses during the COVID-19 pandemic. **Methods:** The sample consisted of 550 Greek nurses working in Greece and other European countries (460 women and 90 men). Ways of Coping was used as the data collection tool. Participants were invited to complete the questionnaire via online GOOGLE FORMS. The statistical processing was carried out using a descriptive and inferential analysis via the statistical package for Social Science (SPSS v.21). **Results:** Analysis of the results shows a statistically significant difference between the two genders in the questionnaire's subscales "Search for social support" (Women=1.88, Men=1.57, $p < 0.001$) and "Wishful Thinking" (Women=1.76, Men=1.51, $p < 0.001$). Also, there was a statistically significant difference in terms of country of work regarding the following subscales: 'Search for social support' (Greece=1.85, Outside Greece=1.67, $p = 0.019$), 'Wishful Thinking' (Greece=1.74, Outside Greece=1.51, $p = 0.005$) and 'Problem Solving Assertion' (Greece=1.39, Outside Greece=1.13, $p = 0.001$). **Conclusion:** Stress response strategies for nurses are fundamental in addressing the difficult situations and conditions they face due to the COVID-19 pandemic. **Keywords:** Stressful situations, strategies, COVID-19 pandemic.

1. BACKGROUND

The definition of 'stress response strategies' has been founded in psychological terms and refers to 'continually changing cognitive and

behavioral efforts to manage specific internal and external demands that are particularly painful'. This debate provokes a conscious effort to solve personal and interpersonal problems, seeking both control and minimization of stress (1). In this context, psychological mechanisms for dealing with a problem are commonly called coping strategies or skills (2).

Responses to these questions were classified by Lazarus & Folkman (1987) based on problems and emotions (3). The ways of dealing with problems are very helpful in terms of learning, clinical performance and student well-being, and their ways of dealing with these emotions can be either constructive or harmful to their health (4).

In recent decades, researchers' focus on investigating work stress in health care areas has been rapidly evolving, attracting the interest of a wide range of studies. In this context, stress is suspected to emerge through existing workplace tensions which affect the psychological well-being of employees. A lack of human resources, the demanding pace of work, the daily care of patients and various conflicts between colleagues are some of the factors that give increased work stress. A high rate of work-related stress can be found amongst healthcare providers and especially nurses whose workload is particularly high (5).

Occupational stress has been the subject of rigorous scientific study in recent decades, bringing to the surface the urgent importance of dealing with it, especially through the provision of information to health professionals regarding its nature, manifestations and modern therapeutic approaches.

According to the World Health Organiza-

tion (2018) 'work-related stress is the answer people can have when they are presented with work requirements and pressures that do not correspond to their knowledge and skills, with a continuous demand for management and adaptation' (6).

The COVID-19 pandemic is an unprecedented crisis affecting all countries and having critical consequences in the medical, social, political, economic, religious and cultural sectors (7). The new coronary covid-19 first erupted in Wuhan, China in late 2019 and caused enormous disruption to the medical community of the country and the rest of the world. This particular type of coronavirus has been classified as COVID-19 causing infections and deaths initially in China and gradually spread worldwide. Thus, the COVID-19 pandemic created an unprecedented international public health emergency in recent times.

In addition to the biological context and the changes in everyday life that this pandemic caused, overcoming it proved to be an even bigger challenge in terms of resilience capacity. Previous studies have shown that in several cases of similar pandemics there have been drastic individual and social psycho-social consequences. Yet, during this particular pandemic, high levels of stress, anxiety and depression have already been observed amongst the general population. In this context, a study conducted in Brazil on COVID-19 on nurses found a high incidence of stress and post-traumatic stress disorder (PTSD), with higher levels of stress in women and nurses compared to men and doctors respectively. This may be because nurses have closer contact with patients, leading to greater levels of fatigue and tension (8).

A study by Long et al., (2020) showed that there are two strategies to deal with stressful situations as caused to nurses by the COVID-19 pandemic. One type of response focuses on the problem in hand (i.e. the pandemic per se) and its resolution or actions to improve the situation. The other type of response is emotional orientation aimed at dealing with emotional distress. Emotions are known to eventually 'become' a certain behavior. For example, fear is associated with the desire to protect, anger leads to attack and success to fulfillment; coping strategies are also linked to emotions, i.e. confronting anger and fear is usually achieved by active orientation of the person (9).

2. OBJECTIVE

The purpose of this study is to explore both the stress response strategies of Greek nurses parties working in Greece and Europe during the COVID-19 pandemic and the degree of potential correlation between socio-demographic data and response strategies.

3. MATERIAL AND METHODS

This survey was conducted using a quantitative methodology to collect data regarding stress strategies employed by a wide sample. Thus, this is a descriptive study aiming at recording data and uncovering potential relationships amongst the study parameters (10).

Sample

The population under study was Greek nurses working both in Greece and abroad in other European countries, in

Great Britain and Australia. The sample consisted of 550 people (460 women and 90 men), working in various clinical fields. Participants were invited to fill-in a questionnaire via an online GOOGLE FORMS site. The survey questions did not ask the respondent to provide identification information (such as name, address, telephone number, etc.) or demographic information from which participants could be located or identified. The survey population was broad and diverse enough to maintain the anonymity of individual respondents. Prior to the completion of the questionnaire there was an introductory information note concerning the purpose of the study, assurance of anonymity, voluntary participation, as well as instructions for the correct completion of the questionnaire.

A Greek version of the 'Ways of Coping' (WCQ) questionnaire of Lazarus and Folkman (1984) was used to assess the sample's Stress Management Strategies. The WCQ is a reliable tool for estimating the frequency with which individuals apply a certain tactics when faced with specific problems. The WCQ was originally developed as a list of 68 topics describing a wide range of processes or methods, cognitive and behavioral that a person could use to deal with a problem or condition being assessed as unpleasant. The scale was later revised to produce a 67-item scale. The Greek version of the WCQ scale includes 38 statements and the answers are given in a 4-point Likert scale with a score ranging from "Never=0" to "Often=3". The weighting results are displayed in five sub scales that constitute the Stress Management Strategies: (a) Positive Approach, (b) Search for Social Support, (c) Wishful Thinking, (d) Avoidance and (e) Problem Solving Assertion. The score of each subscale is obtained by summing the responses of the individual statements divided by their number (average score per statement). The median, in the average score, is 2.5. The higher the score, the higher the frequency of use of the specific stress response strategy of the respondent. The reliability factor Cronbach's α in the Greek version of the questionnaire is 0.79, 0.77, 0.77, 0.74 and 0.60 respectively for the five sub-scales of the WCQ.

Statistical analysis

For descriptive statistical analysis, the continuous variables were expressed in the form of mean, (M) and standard deviation (SD), while the discrete variables were expressed in absolute frequency (N) and relative frequency (N%). For measuring the reliability of the sub-scales the internal cohesion factor was studied. This is a factor that evaluates the extent to which the questions that make up a scale measure the same concept. It was computed by using the Cronbach's α , which estimates the degree of correlation between a particular question and the overall tool. Values higher or closer to 0.7 are considered acceptable. An internal affinity factor of Cronbach's α between 0.5 and 0.6 is considered sufficient in the initial stages of a study. If the alpha value exceeds 0.8 (80%), then it is considered a particularly good reliability analysis.

To study the relationship between two continuous variables, Linear Variate Correlation via the Pearson Index was used. Spearman Correlation Index was employed in order to study the relationship between a continuous variable and a regular variable. For the comparative study of mean

values between two different groups, the t-test was used for independent samples, because the requirement of normality was met. For the comparative study of mean values between two time points, the t-test was used for dependent samples, as normality criterion was again met. To study the relationship between a continuous variable and a nominal variable, ANOVA was used. The minimum value of the statistical significance level was set at $p < 0.05\%$.

4. RESULTS

The study sample consists of 550 subjects (460 females and 90 males) with a mean age of 38.5 years ($SD=9.9$). The average working experience was 13.3 years ($SD= 10.1$). Over half the sample were married with 40% single, 45% are graduates of higher education and approximately one in three hold a master's degree. Three quarters of the partici-

		N	
Family status	Single	220	40%
	Married	279	50.7%
	Divorced	45	8.2%
	Widow	6	1.1%
Educational level	Secondary	102	18.5%
	Tertiary	250	45.5%
	MSc	169	30.7%
	PhD	29	5.3%
Employment sector	Private sector	147	26.7%
	Public sector	403	73.3%
Country of occupation	Greece	481	87.5%
	Outside Greece	69	12.5%

Table 1. Sample demographics

	CRONBACH'S α (SAMPLE)	CRONBACH'S α (KARADIMAS, 1998)
Positive Approach	0.813	0.790
Search for Social Support	0.741	0.770
Wishful Thinking	0.778	0.770
Avoidance	0.696	0.740
Problem Solving Assertion	0.524	0.600

Table 2. Internal consistency of WCQ's subscales (Ways of Coping)

	Gender	N	Mean	Std. Deviation	p-value
Positive Approach	Female	460	2.0928	,49428	0.123
	Male	90	2.0040	,51805	
Search for Social Support	Female	460	1.8808	,59763	< 0.001
	Male	90	1.5741	,62066	
Wishful Thinking	Female	460	1.7551	,63589	0.001
	Male	90	1.5070	,63918	
Avoidance	Female	460	1.7011	,50340	0.105
	Male	90	1.6056	,54479	
Problem Solving Assertion	Female	460	1.3685	,59279	0.186
	Male	90	1.2778	,59897	

Table 3. T-test for independent samples of gender-based sub-scale scores

	Family Status	N	Mean	Std. Deviation	p-value
Positive Approach	Single	220	1.9849	,50087	0
	Married	279	2.1290	,48623	
Search for Social Support	Single	220	1.7879	,60938	0.125
	Married	279	1.8734	,62336	
Wishful Thinking	Single	220	1.6529	,62414	0.056
	Married	279	1.7652	,67003	
Avoidance	Single	220	1.6980	,49936	0.729
	Married	279	1.6819	,52460	
Problem Solving Assertion	Single	220	1.3625	,61061	0.694
	Married	279	1.3414	,58085	

Table 4. Results t-test for independent samples of the scores of the sub-scales on the basis of the family situation (only for unmarried and married persons)

	Country of Occupation	N	Mean	Std. Deviation	p-value
Positive Approach	Greece	481	2.0913	,48221	0.105
	EU	69	1.9873	,59846	
Search for Social Support	Greece	481	1.8538	,60082	0.019
	EU	69	1.6691	,66390	
Wishful Thinking	Greece	481	1.7435	,63075	0.005
	EU	69	1.5126	,69037	
Avoidance	Greece	481	1.6893	,50135	0.642
	EU	69	1.6587	,57788	
Problem Solving Assertion	Greece	481	1.3851	,59265	0.001
	EU	69	1.1341	,56161	

Table 5. T-test results for independent samples of sub-scale scores based on the country of employment

pants work in the public sector with the majority working in Greece. The following table 1 details the characteristics of the sample.

Scale reliability analysis

The following table 2 shows the internal consistency analysis of the conceptual construction of the WCQ as in Cronbach's α . From the results it appears that all subscales record similar values to the corresponding indicators of the literature for the Greek version of this questionnaire.

Based on the results of the t-test for independent samples, difference, statistically significant, between the sexes was found in the subscales "Search for social support" (Women = 1.88, Men = 1.57, $p < 0.001$) and 'Wishful Thinking' (Women = 1.76, Men = 1.5 $p < 0.001$) (table 3).

The analysis was performed only for those individuals who are single or married, due to the very small number of divorced and widowed. Based on the results of the t-test for independent samples (i.e. unmarried and married individuals) statistical significant differences were found

Spearman's Rho	Positive Approach	Correlation Coefficient	,035
		Sig. (2-tailed)	,410
		N	550
	Search for Social Support	Correlation Coefficient	-,022
		Sig. (2-tailed)	,611
		N	550
	Wishful Thinking	Correlation Coefficient	-,115**
		Sig. (2-tailed)	,007
		N	550
	Avoidance	Correlation Coefficient	-,092*
		Sig. (2-tailed)	,030
		N	550
	Problem Solving Assertion	Correlation Coefficient	,065
		Sig. (2-tailed)	,130
		N	550

Table 6. Linear Variate Correlation, between the mean value of the sub-scales and the educational level

in the subscale 'Positive approach' (M married=1.98, M single=2.13, $p<0.01$) (table 4).

Based on the results of the t-test for independent samples, i.e. between the country of work, statistically significant differences were found in the subscales 'Search for social support' (Greece=1.85, Outside Greece=1.67, $p=0.019$), 'Wishful Thinking' (Greece=1.74, Outside Greece=1.51, $p=0.005$) and 'Problem Solving Assertion' (Greece=1.39, Outside Greece=1.13, $p=0.001$). (table 5, 6)

Results of the average value of the scores of the sub-scales related to the educational level were as follows:

Linear variable correlation, recorded between the educational level and the subscale - for 'Wishful Thinking' there was a statistically significant and strong negative correlation ($rs(550)=-0.115$, $p=0.007$). That is a lower educational level corresponds to a higher average frequency of the variable 'Wishful Thinking' - for 'Avoidance-Escape' there was a statistically significant strong negative correlation ($rs(550)=-0.092$, $p=0.030$). That is a lower educational level corresponds to a higher average frequency of the variable 'Avoidance-Escape'.

5. DISCUSSION

This study aimed at exploring the strategies for dealing with stressful situations experienced by Greek nurses in specific working conditions in Greece and abroad as affected by the COVID-19 pandemic and to relate these with their socio-demographic characteristics.

The findings of the study on stressful situations and ways of dealing with them found that there are differences in total scores and sub-scales based on gender, marital status, country of work, and educational level. The analysis showed that all sub-scales record similar values to the correspond-

ing indicators in the literature for the Greek version of the WCQ questionnaire.

As to whether the average value of the scores of the sub-scales on the basis of gender differs, the results of the t-test for independent samples showed a statistically significant difference between the two sexes. This was particularly noticeable in the sub-scales 'Search for social support' (Women=1.88, Men= 1.57, $p<0.001$) and 'Wishful Thinking' (Women=1.76, Men=1.51, $p<0.001$). This finding showed the importance of a social support system within the work environment, which is another important factor affecting the nurses' ability to cope with the stressful nature of the critical care environment. Our result is also supported by studies that have shown that women report using more coping strategies (11,12). Frydenberg and Lewis (1991) also reported gender differences in dealing with stress. Furthermore, they found that women use social support and support from close friends (13). Social relationships allow people to listen and encourage and reassure each other, to regulate emotions and maintain flexibility, thus helping people manage their stress. Also, according to a report by Folkman and Lazarus (1980), women employ more strategies than men to seek help and emotional support (14). Therefore, our study results from Greece, confirm findings from a wide range of the international literature.

With regards to the average number of grades of scales and subscales based on family status, a statistically significant difference was found between married and unmarried individuals in the 'Positive Approach' subscale ($p=0.001$). In line with our results is the study of Kaleas & Platsidou (2008), where statistically significant differences were also found in the age and married life of couples (15). In another survey conducted by Mila Nu Nu Htay et al., (2021), more than 70% of respondents replied that 'family support' and 'thinking positively' were positive strategies for them during the COVID-19 pandemic (16).

As for the average number of scores of scales and sub-scales possibly differing based on the country of employment, the results of the t-test for independent samples showed a statistically significant difference between the country of work. This was found in the sub-scales 'Social support search' (Greece=1.85, Outside Greece=1.67, $p<0.01$), 'Wishful Thinking' (Greece=1.74, Outside Greece=1.51, $p=0.005$) and 'Contention problem solution' (Greece=1.39, Outside Greece=1.13, $p<0.01$). A possible placement of the researcher is that in Greece, the lack of resources, the lack of professional and social support, the excessive work up to the point of exhaustion, the low pay as well as the fear of infection and spread of the disease to others, lead nurses to seek support and immediate solution of problems. From a study by Boru et al, (2013) it emerged that compromise is the method of conflict resolution that gathered higher score in the sample total and subsequent avoidance (17).

Finally, if the average value of the sub-scale scores is correlated based on the educational level, the Linear Variate Correlation, recorded between the educational level and the sub-scale: 'Wishful Thinking', statistically significant strong negative correlation ($rs(550)=-0.115$, $p=0.007$). That is, a lower educational level corresponds to a higher mean frequency of the variable Wishful Thinking while 'Avoid-

ance – Escape’, showed a statistically significant strong negative correlation ($r(550)=-0,092$, $p=0,030$). That is, a lower educational level corresponds to a higher average frequency of the variable ‘Avoidance – Escape’. In line with our results, is the findings of a study by Zyga et al., (2016) which showed that nurses who graduated from universities used significantly lower use of the strategies ‘Prayer / Daydream’ and ‘Search for divine intervention’ and significantly more of ‘Problem solving’ compared to nurses with a lower educational level (18).

This study attempts to assess for the first time the use of stress response strategies experienced by Greek nurses in specific working conditions in Greece and Europe affected by the COVID-19 pandemic and their correlation with their socio-demographic characteristics. Although this study has produced some interesting results, it is nevertheless subject to some limitations, which need to be mentioned in order to be taken into account in future research on investigating patient anxiety strategies during the COVID-19 pandemic.

6. CONCLUSION

The issue under investigation concerning the strategies for dealing with the anxiety-aggravating conditions of nurses during the COVID-19 pandemic period seems to have been a concern for researchers worldwide, resulting in an ongoing debate regarding factors affecting the mental health of nurses during the pandemic period. However, it would be advisable to further this study by approaching larger samples as possible and collecting data from both nurses and other staff in public and private hospitals, in order to compare healthcare professional groups.

The present study highlights the importance of understanding stress response strategies in order to provide an opportunity to develop appropriate intervention programs. Thus, the main objective remains to strengthen nurses who care for COVID-19 patients in their transition for reaching successful adaptation and to address the difficult situation they are experiencing. As Sarafis et al have already concluded in their study nurse’s ability to cope with the demands and stress from work may be improved with specific occupational health education and specific training programs that improve their knowledge and ability (20) while recent study findings of Tzenetidis et al have come to the conclusion that psychological work environment is of great importance during the COVID-19 pandemic and occupational rewards and benefits should be provided to HCWS including money, esteem, positive feedback, and career opportunities. (20)

Study limitations

A significant limitation of this study refers to the research tool used to collect the data and the length of time of research. The questionnaire has been validated in Greek before, which adds validity and reliability to this survey per se. However, the questionnaire was produced electronically and shared through social media and the email addresses of the nurses, who meant that the researchers were unable to observe the time spent completing it, the sincerity of the answers and the personal dedication to it during its completion. Nevertheless, the investigation ensures the criteria of validity and reliability, because all the necessary

explanations have been given in this regard.

- **Author’s contribution:** S.K., D.T., T.P.gave substantial contributions to the whole work: objective, design and discussion. Z.K., P.S., G.T.were involved in data collection and analysis. M.M., Z.K., P.S. did article preparing for drafting and revising it critically for important intellectual content. All authors gave final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
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