



The Mediating Effect of Coping Strategies on the Relationship between Perceived Stress and Quality of Life among Jordanian Registered Nurses during COVID-19: Across-correlational Study

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ABSTRACT

Background: Nurses have reported considerable levels of perceived stress during pandemics, impairing quality of life in registered nurses. Studies supported the mediating roles of some coping strategies on the correlation between perceived stress and quality of life. However, rare studies have investigated these roles among Jordanian registered nurses during the COVID-19 pandemic. **Purpose:** Mainly to examine the mediating role of coping strategies in the relationship between perceived stress and quality of life in Jordanian registered nurses during the COVID-19 pandemic. **Methods:** A cross-sectional correlational design was used with an online survey. Convenience sampling was used to select 550 registered nurses from 8 hospitals located in Amman and Irbid cities. A demographic questionnaire, the Perceived Stress Scale, the Brief COPE inventory, and the World Health Organization-related Quality of Life scale were used to collect data. Descriptive and multiple-regression analyses were used to analyze the data collected. **Results:** Religion and then substance use were commonly used as coping strategies by Jordanian registered nurses. Substance abuse only mediated the relationship between stress perception and quality of life. **Conclusion:** Substance use only played a mediating role between perceived stress and quality of life among Jordanian registered nurses. Perceived stress and substance use should be valued as important variables for improving registered nurses' quality of life. **Implications for Nursing:** The results can be used by hospital administrators and decision makers as an empirical basis for planning and implementing effective coping strategies to manage nurses' stress other than maladaptive coping strategies such as substance use.

Keywords: Coping strategies, Perceived stress, Quality of life, Registered nurses, COVID-19 pandemic.

What does this paper add?

1. Religion and then substance abuse were the most common coping strategies used by Jordanian registered nurses during Covid-19.
2. Substance abuse partially mediated the effect of stress perception on QoL in Jordanian registered nurses during Covid-19
3. Perceived Stress and substance use should be valued

as important variables for improving Jordanian registered nurses' quality of life.

Introduction

By March 2020, the first case of coronavirus disease 2019 (COVID-19) in Jordan was detected, and since then, there has been an aggressive increase in the COVID-19 cases. At the end of December 2023, there

were approximately 1 746 997 confirmed cases and 14 122 deaths in Jordan (World Health Organization, 2024). Because of the growing number of daily new and death cases of COVID-19 in Jordan, the demand for health-care services has increased and nurse-to-patient ratio has decreased, resulting in a significant increase of workload on nurses. The increased workload on the frontline health-care workers, such as nurses who managed patients with COVID-19, was significantly associated with high levels of perceived stress, consequently threatening their quality of life (QoL) (Kang et al., 2020). The COVID-19 did not affect only nurses' stress and emotional health, but also how to cope with new challenging situations (Montemurro, 2020).

Background

Perceived stress has been found to be highly prevalent among nurses during COVID-19 pandemic worldwide (Al Maqbali et al., 2021). According to the transactional theory of stress, perceived stress is defined as an individual-environmental particular relationship that is appraised by individuals as challenging or threatening and being beyond their available coping resources (Lazarus & Folkman, 1984). In a systematic review including 40 studies conducted throughout the world, the prevalence of perceived stress among nurses during COVID-19 accounted for 43% of the overall prevalence of perceived stress (Al Maqbali et al., 2021). In another systematic review including 100 studies conducted in 35 countries, it was shown that 45% of health-care providers, including nurses, had stress while providing care for the patients with COVID-19 (Fernandez et al., 2021). In Jordan, the majority of nurses (64%) reported high levels of stress during the COVID-19 pandemic (Shahrour & Dardas, 2020). Perceived stress experienced by nurses has potentially resulted from situations appraised as challenging or threatening during the COVID-19 pandemic while adaptive coping resources have not been available to manage these situations. These stressful situations included fear of transmitting infection to families, lack of health-care protocol to manage COVID-19 cases, fear of contracting COVID-19 infection, insufficient availability of PPE, being redeployed to assist in areas outside their specialty, and inadequate training on donning and doffing of PPE (Hassan et al., 2022).

The harmful consequences of stress perception on QoL in nurses during the COVID-19 pandemic are well

recognized in the literature. According to the World Health Organization (2012), QoL is a subjective and multi-dimensional concept which refers to the perception of individuals regarding their role of life in a certain culture that includes their goals, expectations, standards and interests. In a systematic review, Kotijah and Wahyuni (2022) reported that stress, anxiety and depression among health-care workers including nurses have increased during the pandemic, negatively affecting their QoL. In Jordan, Almhdawi et al. (2023) reported that QoL of Jordanian nurses was relatively low during COVID-19. Age, educational level, work experience, workplace, working shift, gender, and income were significantly correlated with QoL and mental-health problems among nurses during the pandemic (Baraka et al., 2023; Khatatbeh et al., 2023; Ndlovu et al., 2022).

Generally, nurses have been found to cope differently with stressful situations (Montemurro, 2020). Coping strategies are described as cognitive and behavioral efforts used as a response to specific threatening or challenging situations (Lazarus & Folkman, 1984). Individuals differently use problem -or emotion-focused coping strategies based on the availability of these coping resources (Lazarus & Folkman, 1984). Some individuals respond directly to the stressful situations through the use of problem-focused strategies (e.g. active coping, use of informational support, planning, and positive reframing) that aim to solve the problem or change the sources of stress (Lazarus & Folkman, 1984; Nawel & Elisabeth, 2015). However, other individuals draw to emotion-based coping strategies (e.g. self-distraction, denial, substance use, and behavioral disengagement venting, use of emotional support, humor, acceptance, self-blame, and religion) that aim to relieve negative emotions evoked by the stressor (Lazarus & Folkman, 1984; Nawel & Elisabeth, 2015). Problem-based coping strategies have been found to be associated with lesser degrees of stress and higher levels of QoL (Abdalahim, 2013; Nawel & Elisabeth, 2015). Nevertheless, such techniques can worsen the level of stress when controlling stressful situations is impossible (Abdalahim, 2013; Nawel & Elisabeth, 2015). Conversely, emotion-based coping strategies temporarily reduce stress and its negative health outcomes and some of these strategies are associated with low QoL. Even though, some studies have reported

that such coping strategies improved nurses' psychological health (Abdalrahim, 2013). In Indonesia, nurses have generally reported to use frequently adaptive coping strategies that improved their QoL, such as religion, positive reframing, instrumental support, and planning (Fathi & Simamora, 2019). However, a study has found that avoidant coping strategies, described as maladaptive coping strategies, were favored by nurses in a study conducted in Dublin (McTiernan & McDonald, 2015). During the COVID-19 pandemic, Sehularo et al. (2021), in their narrative review, found that nurses have used the following coping strategies: use of COVID-19 protective measures, avoidance strategy, social support, faith-based practices, psychological support and management support (Sehularo et al., 2021). Similarly, In Jordan, nurses have coped negatively with compassion fatigue, a dimension of QoL, using an avoidant strategy, such as substance use (Jarrad et al., 2018).

According to Lazarus and Folkman (1984), coping strategies are considered as mediators of the relationship between perceived stress and health outcomes (Lazarus & Folkman, 1984). In a cross-sectional study that examined whether coping strategies mediated the relationship between stress and QoL in parents having autistic children, the results revealed that accepting responsibility was the only coping strategy that mediated the correlation between QoL and stress (Dardas & Ahmad, 2015). In a longitudinal study, the authors investigated the mediating roles of engagement and disengagement in the relationship between stress and mental-health QoL among breast-cancer patients. They found that disengagement coping only played as a mediator in such relationship (Yang et al., 2008). A longitudinal study also investigated the mediating effect of coping methods on the relationship between perceived stress and QoL among Italian rescue workers. The results revealed three coping methods that mediated the relationship between perceived stress and compassion fatigue, including emotion support, self-blame, and self-distraction. Religion and self-blame were identified as mediators between stress perception and burnout. Moreover, self-blame and problem-focused coping mediated the relationship between stress perception and compassion satisfaction (Prati et al., 2011).

Although the above studies supported the mediating roles of some coping strategies in the relationship

between QoL and stress perception, no study has investigated such meditating roles among nurses. Individuals in different cultures and institutions considerably vary in term of the definition what a stressor is, the degree to which a given situation is appraised as stressful, and the coping strategies that are available to use in any given stressful situation (Aldwin, 2004). Based on that, it is assumed that nurses may experience stressors and coping strategies dissimilar to those experienced by the above populations, which in a different way influence QoL. Thus, the purpose of the current study was generally to examine the mediation role of coping strategies in the correlation between stress perception and QoL in registered nurses. A secondary objective was to explore the coping strategies used by Jordanian registered nurses during the COVID-19 pandemic.

Significance of the Study

The assessment of perceived stress and its effect on QoL among nurses during the COVID-19 pandemic, can be very difficult, because nurses work in complex and challenging environments. Indeed, the effectiveness of organizational interventions for mitigating stress and improving QoL among nurses is based on understanding the nature of the stress phenomenon and its relationships with health outcomes, such as QoL, in the nursing profession (Deliktas et al., 2021). The transactional theory of stress (Lazarus & Folkman, 1984) is consistently used in nursing research to understand the phenomenon of stress and its relationship with health and QoL. It emphasizes the role of individual cognitive appraisal and coping in responding to similar stressful situations (Lazarus & Folkman, 1984). However, to the best of our knowledge, there is rare research that has studied the concepts of the transactional theory of stress, such as perceived stress, coping strategies, and QoL and the relationship between them among Jordanian nurses during the COVID-19 pandemic. Thus, the current study contributes to test this theory partly in the context of COVID-19 pandemic and extend the body of literature by highlighting the relationship between these concepts among nurses and shedding light onto the mediating role of coping strategies used by Jordanian nurses during the COVID-19 pandemic.

Diminished QoL and perceived stress disturb the ability of nurses in offering high-quality patient care (Stojanov et al., 2021). Based on the results of this study,

policymakers, nursing administration, and nursing educators may be urged to study and develop effective counseling measures and stress-reduction interventions which are based on adaptive coping strategies to reduce perceived stress among nurses and thus enhance their QoL during the challenging situations, such as pandemics.

Methods

Design

A cross-sectional correlational design adhered to the STROBE guideline was used in the study. This design allowed collecting large amount of data in a relatively short time. Also, this design best suits the process of achieving our objectives, as we aim to examine the relationships between many variables in real situations at one point of time.

Sample and Settings

The target population for this study is Jordanian registered nurses, who work in Jordanian general hospitals. Accessible population is registered nurses working in middle and northern regions in Jordan, specifically Amman and Irbid cities. A convenience-sampling method was used to select the study subjects who were registered nurses working in eight large hospitals located in Amman and Irbid cities in Jordan (three private hospitals, one university hospital, two public hospitals, and two military hospitals). The

hospitals were selected to represent all types of Jordanian hospitals including private, public, university and military hospitals, which were assigned by the Jordanian Ministry of Health to manage patients with COVID-19. The inclusion criteria were as follows: 1) having at least a baccalaureate degree in nursing, and 2) having a minimum of six months of nursing experience. Registered nurses who were unwilling to participate, and those who were working in outpatient clinics were excluded.

To calculate the required sample size, *a priori* of power analysis by G*Power software was used. Based on an α level of 0.05, a power of 0.95, and a relatively medium effect size of 0.075 (Green, 2010) with nine predictors including the primary independent variables and demographic and working variables in regression analysis, the calculated sample size required for this study was 324 subjects. Because of the tight schedule of registered nurses in workplaces during the pandemic and the use of an online survey as a data-collection method, it was assumed that the non-response rate would be high. Taking into consideration an estimated non-response rate of 50% (Shahrour & Dardas, 2020), approximately 324 subjects should be further included, producing the final required sample size of 650 subjects. However, of 650 surveys sent, 550 surveys were successfully completed and returned by the subjects. The response rate in the current study was approximately 85% (see Figure 1).

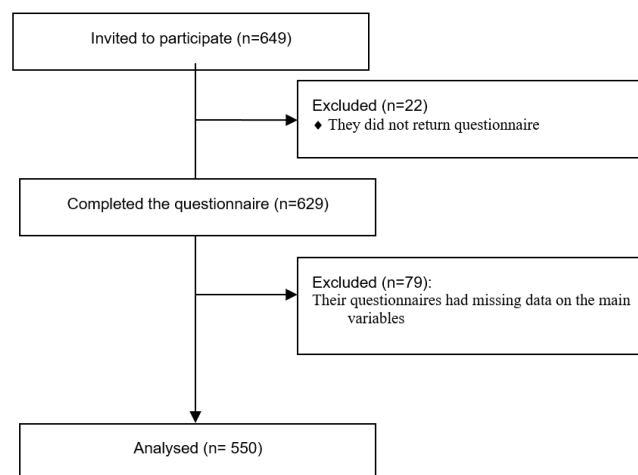


Figure 1. Study flow diagram

Measurements

An Arabic self-report questionnaire was used in the study that included four sections: Demographic and

working characteristics, the Perceived Stress Scale (PSS) (Almadi et al., 2012), the Brief COPE (Nawel & Elisabeth, 2015), and the World Health Organization

Quality of Life- BREF scale (The WHOQOL-BREF) (Group, 1998; Ohaeri & Awadalla, 2009).

The first section of the study's questionnaire involved items that addressed the subjects' demographic and working variables. The variables were as follows: Gender, marital status, educational level, monthly income, age, nursing experience in years, type of hospital (i.e., public or private hospital), and type of working shift (two-shift or three-shift type).

The second section of the questionnaire included the Arabic version of the Perceived Stress Scale (PSS) (Almadi et al., 2012), which is used to evaluate the levels of stressful appraisal or perception. It consisted of 10 items evaluated on a Likert scale ranging from 0 (never) to 4 (very often). The total scores ranged from 0 to 40, with higher scores indicating higher degrees of stress perception (Cohen et al., 1983). The scale showed valid results when used among college students. The Arabic PSS revealed acceptable levels of psychometric characteristics among the general population in Jordan. Two factors were revealed with the Cronbach's alpha of 0.74 for factor 1, 0.77 for factor 2, and 0.80 for the whole scale (Almadi et al., 2012). The Chronbach's α for the Arabic PSS in the current study was 0.79.

The third section of the questionnaire included the Arabic version of the Brief COPE inventory (Nawel & Elisabeth, 2015). It is a 28- item scale that measures the coping strategies used by individuals as attempts to handle stressful situations. The items were rated on a 4-point Likert scale, ranging from 1 (I didn't do this at all) to 4 (I do this a lot). Among registered nurses, the original Brief-COPE (English version) revealed a Cronbach's alpha of 0.872 (Gomes et al., 2013). Among Arabic healthy adults, the factor analysis showed that the Arabic version of the inventory consisted of 14 sub-scales with Cronbach's alpha coefficients ranging between $\alpha = 0.63$ and $\alpha = 0.94$ (Nawel & Elisabeth, 2015). The Chronbach's α for the Arabic Brief COPE in the current study was 0.91.

The fourth section of the questionnaire included the World Health Organization Quality of Life-brief (WHOQOL-BREF)- Arabic version (Group, 1998; Ohaeri & Awadalla, 2009). It is a shorter version of the WHOQOL-100 that can be used for patients with a particular disease, general population, and health-care providers. It includes 26 items that cover four dimensions of QoL: physical health (7 items), psychological health (6 items), social relationships (3

items), and the environment (8 items). Two items are added to assess the overall perception of QoL and the overall perception of general health. The scale items are evaluated on a 5-point Likert scale that ranges from 1 (disagree or not at all) to 5 (completely agree or extremely). According to the scoring system of the scale, the total raw scores of each domain are transformed linearly to a 0-100 scale, with higher scores indicating higher levels of QoL. The Arabic version of the scale revealed a Cronbach's α of .70, indicating an adequate level of internal consistency (Ohaeri & Awadalla, 2009). The Chronbach's α for the Arabic WHOQOL in the current study was 0.89.

Data Collection

The principal investigator contacted and asked nursing managers working in the hospitals to invite registered nurses to take part in the study. When registered nurses accepted to participate, an online Google Form including the Arabic study consent form and questionnaire was sent to them by the principal investigator through e-mail or WhatsApp. The first page of the online Google Form included an electronic Arabic consent form. Participants who clicked the "I accept" button were permitted to access and complete the Arabic study questionnaire. Subjects who did not submit the online questionnaire within one week received a reminder to kindly complete it. The study data was collected between May 2020 and August 2020.

Ethical Considerations

The study was approved by the Institutional Review Board at Jordan University of Science and Technology and followed the Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects. Participants were assured that the participation is voluntary, and that they were free to withdraw from the study at any time. Returning the completed questionnaire was considered as the participant's approval to participate in the study. Anonymity and confidentiality were assured by replacing the participants' names by numbers to avoid their identification. The study data was stored in a password- protected computer and nobody was able to use the data except the study researchers. Nobody was excluded due to her or his sex, religion, and race. Because of the use of an online survey as a data-collection method, the transmission of COVID-19 infection was considerably minimized.

Data Analysis

The IBM SPSS statistics software (version 25.20) was used to analyze the study data. Before addressing the study's research questions and testing its hypotheses, the study data was appropriately coded and entered into an SPSS file. The problem of missing values and outliers was examined. Missing data was examined using frequency distribution or descriptive statistics. Methods used to manage missing values were based on the extent of missing data, pattern of missing data, nature of missing data, role of the variable, and level of measurement of the variable. Box plots, whisker plots, and frequency distributions were used to discover outliers. The assumptions of statistical tests used to analyse the data were then examined. The assumptions of bi-variate and multi-variate normality, homoscedasticity, and multi-collinearity for multiple-regression tests were examined.

Descriptive analyses were initially conducted as appropriate. Multiple-regression tests were used to examine the associations between QoL, coping strategies, and perceived stress and the demographic and working variables. After that, the statistical method and principles suggested by Baron and Kenny (1986) were used to examine the mediating effects of coping strategies (mediators) on the relationship between stress perception (i.e. independent variable) and QoL (i.e. dependent variable). Four specific conditions must hold before a variable can be considered to be a mediator. Any other covariates should be included in the regression when testing these conditions (Bennett,

2000).

- a) Stress perception is significantly related to coping strategy.
- b) Stress perception is significantly related to QoL.
- c) Coping strategy is significantly related to QoL.
- d) The effect of stress perception on QoL must be less after controlling for coping strategy.

In step (d), if the partial correlation between stress perception and QoL becomes insignificant, full mediation is confirmed. If the partial correlation between stress perception and QoL is less than the raw correlation between stress perception and QoL (as resulted in step (b)) and still significant, partial mediation is confirmed (Bennett, 2000).

Results

Description of Sample

Most of the participating clinical nurses were female (68.9%). The mean age of the study subjects was 29.61 years (SD=5.24). Most subjects (62.2%) were married, whilst (37.8%) were single. The mean number of children among married nurses (n=313) was 1.16 children (SD=1.4). The majority (86%) of the subjects had a baccalaureate degree in nursing. As with regards to hospital type, 17.2 % of the participants were working in private hospitals, 15.2 % in public hospitals, 25.1 % in military hospitals, and 42.3 % in university hospitals. As for shift pattern, 76% of the subjects were working three shifts (A, B, and C). The subjects' nursing experience was 6.85 years on average (SD= 4.95) (See Table 1).

Table 1. Socio-demographic and professional variables of the participants (N=550)
JD = Jordanian Dinar; SD= standard deviation

Variables	Categories	Frequency (%)	Mean (SD)
Gender			
	Male	171 (31.1)	
	Female	379 (68.9)	
Marital status			
	Single	208 (37.8)	
	Married	342 (62.2)	
Educational level			
	Bachelor's degree	471 (86)	
	Master's degree	79 (14)	
Monthly income			
	200-399	82 (14.9)	
	400-599	269 (48.9)	

	600-799	166 (30.2)	
	800<	33 (6)	
Hospital classification			
	Private	326 (59.3)	
	Public	242 (40.7)	
Shift pattern			
	Two shifts	132 (24)	
	Three shifts	418 (76)	
Age			29.61 (5.24)
Nursing experience (years)			6.85 (4.95)
Number of children			1.16 (1.4)

Descriptive Statistics of the Main Study Variables

Table 2 shows the results of descriptive analysis for the main study variables (i.e., stress perception, coping strategies, and QoL). The mean score of stress

perception was 19.50. The means score of quality of life was 52.46. Religion (mean= 6.23) and then substance abuse (mean= 5.7) were used by the participants more than other coping strategies.

Table 2. Descriptive statistics of stress perception, coping strategies, and QoL

Variables	Mean (SD)
Stress perception	19.50 (5.22)
Quality of life	52.46 (9.45)
Religion	6.23(1.51)
Substance use	5.73 (.88)
Self-distraction	4.82 (1.48)
Planning	5.66 (1.39)
Acceptance	5.63(1.48)
Active coping	5.40 (1.34)
Positive reframing	5.37 (1.45)
Use of informational support	5.31 (1.63)
Emotional support	5.18 (1.64)
Self-blame	4.81 (1.63)
Venting	4.76 (1.46)
Humor	4.29 (1.67)
Denial	4.20 (1.65)
Behavioural disengagement	4.11(1.54)

SD = Standard deviation.

Correlation between the Main Study Variables and Demographic and Working Variables

Multi-variate correlation analysis for the association between the main study variables (stress perception, coping strategies, and QoL), and the demographic and working variables was conducted. The findings showed that stress perception was not significantly correlated with any of the selected socio-demographic and professional characteristics. QoL was significantly correlated with workplace (B=0.16, p=0.012). Regarding coping

strategies, active coping was significantly correlated with gender (B=-0.127, p=0.031), age (B= -0.274, p= 0.03), and nursing experience (B= 0.348, p= 0.003). Planning was significantly correlated with nursing experience (B=0.32, p= 0.007). Denial was significantly correlated with workplace (B= 0.13, p= 0.046). Acceptance was significantly correlated with nursing experience (B=0.30, p= 0.008). Self-blame was significantly correlated with gender (B= -0.117, p= 0.043), age (B= -0.272, p=0.028), and workplace (B=0.13, p=0.031). Other coping

strategies were not statistically correlated with any of the demographic and working variables.

Mediation Effects of Coping Strategies

Results from the mediation analysis using multiple-regression tests are shown below step by step. The socio-demographic and professional characteristics that were significantly correlated with stress perception, QoL, and coping strategies were controlled in each step of the mediation analysis. The results of the mediation analysis were as follows:

In the first step, the total effect of stress perception on QoL was tested, and it was found that the stress perception was negatively associated with QoL ($B = -0.349$, $t = -8.71$, $p = 0.000$).

In the second step, potential mediators were regressed onto stress perception. Self-distraction ($B = 0.096$, $t = 2.25$, $p = 0.024$), denial ($B = -0.316$, $t = -7.79$, $p = 0.00$), substance use ($B = 2.69$, $t = -3.07$, $p = 0.007$), behavioral disengagement ($B = 0.291$, $t = 7.118$, $p = 0.00$), venting ($B = 0.308$, $t = 7.58$, $p = 0.00$), humor ($B = 0.181$, $t = 4.31$, $p = 0.00$), self-blaming ($B = 0.271$, $t = 6.58$, $p = 0.00$) were significantly associated with stress perception. However, active coping ($B = -0.042$, $t = -0.988$, $p = 0.324$), emotional support ($B = -0.019$, $t = -0.445$, $p = 0.657$), use of information support ($B = 0.05$, $t = 1.18$, $p = 0.238$), positive reframing ($B = -0.052$, $t = -1.22$, $p = 0.222$), planning ($B = -0.078$, $t = -1.84$, $p = 0.066$), acceptance ($B = -0.071$, $t = -1.65$, $p = 0.098$), and religion ($B = -0.018$, $t = -0.425$, $p = 0.671$) were not significantly associated with stress perception.

In the third step, we examined the associations between each proposed mediator and QoL. The results showed that self-distraction ($B = 0.132$, $t = 3.12$, $p = 0.00$), active coping ($B = 0.257$, $t = 0.621$, $p = 0.00$), denial ($B = -0.088$, $t = -2.06$, $p = 0.039$), substance use ($B = -0.13$, $t = -3.07$, $p = 0.002$), emotional support ($B = 0.29$, $t = 7.31$, $p = 0.00$), use of information support ($B = 0.29$, $t = 7.03$, $p = 0.00$), behavioral disengagement ($B = -0.152$, $t = -3.59$, $p = 0.00$), positive reframing ($B = 0.293$, $t = 7.18$, $p = 0.00$), planning ($B = 0.295$, $t = 7.22$, $p = 0.00$), acceptance ($B = 0.276$, $t = 6.72$, $p = 0.00$), and religion ($B = 0.316$, $t = 7.78$, $p = 0.00$) had significant associations with QoL. However, venting ($B = 0.035$, $t = 0.814$, $p = 0.416$), humor ($B = -0.004$, $t = -0.10$, $p = 0.92$), self-blaming ($B = -0.079$, $t = -1.84$, $p = 0.065$) were not significantly correlated with QoL.

In the fourth step, the effect of stress perception on QoL after controlling the coping strategies (i.e., self-distraction, denial, substance use, and behavioural disengagement) was tested. Of these four coping strategies, substance use only met all the conditions of partial mediation as (1) the correlation coefficient for stress perception decreased from -0.349 (the first step) to -0.338 controlling the mediator of substance use (step 4) and (2) both variables of stress perception ($p = 0.00$) and substance use ($p = 0.02$) remained significantly correlated with QoL. The other coping strategies, such as self-distraction, denial, substance use, and behavioural disengagement, did not act as full, or even partial mediators. Figure 2 and Table 3 show the mediation model of substance use.

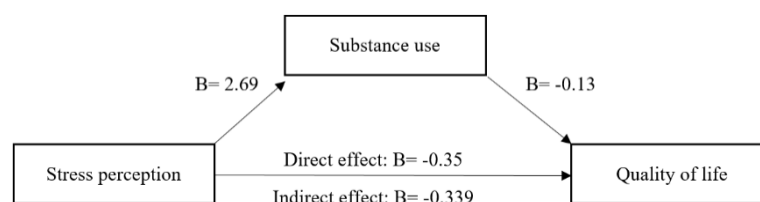


Figure 2. The mediation role of substance use

Table 3. Mediating effect of substance abuse on perceived stress and quality of life (N=550)

Steps	Description	IV	DV	Beta	P-value
1	Direct effect of perceived stress on quality of life	Perceived stress	Quality of life	-0.349	0.00
2	Direct effect of perceived stress on substance abuse	Perceived stress	Substance abuse	2.69	0.007
3	Direct effect of substance abuse on quality of life	Substance abuse	Quality of life	-0.13	0.002
4	Indirect effect of perceived stress on quality of life	Perceived stress	Quality of life	-.0338	0.00
		Substance abuse	Quality of life	0.092	0.02

Note: IV: Independent Variable; DV: Dependent Variable.

Discussion

The purposes of the current study were to examine the mediation role of coping strategies in the correlation between stress perception and QoL in Jordanian registered nurses. The results of the current study revealed that stress perception is negatively correlated with QoL. The results come in line with the results of a study conducted in Jordan showing that occupational stress affects physical and mental QoL in nurses (Hamaideh, 2011). Impaired QoL can be attributed to maladaptive physiological and emotional reactions to stress. Stress perception negatively affects physical and psychological well-being (Parsaei et al., 2020) and leads to impaired job performance, eventually resulting in job dissatisfaction and turnover. These behaviors are considered as important attributes of QoL (Parsaei et al., 2020).

The current-study results showed that religion and then substance use were used as coping strategies by registered nurses more than other coping strategies (Sehularo et al., 2021). These results do not come in line with a literature-review study that reported that avoidance strategy and social support were commonly used by nurses during the COVID-19 pandemic worldwide. However, the current-study results are consistent with a study conducted in Jordan demonstrating that religious coping was commonly used by Jordanian adults to cope with COVID-19 pandemic (Al-Shannaq et al., 2021). This may be attributed to the fact that the majority of people in Jordan are Muslims. Jordanian individuals rely on faith in Allah (God) and practice religious rituals, such as praying, to deal with stressful situations and crises. In the current study, religious coping had a negative and significant relationship with QoL. The Islamic religion is considered by Muslims as a way of life, which teaches individuals the methods to deal with stressful situations that they face (Al-Shannaq et al., 2021).

In the current study, substance use was commonly used by nurses to cope with stress, which was correlated positively with stress and negatively with QoL. These results were consistent with the results of a study conducted in Jordan that found that Jordanian nurses significantly used substances to cope with stressful situations, negatively impacting compassion fatigue (Jarrad et al., 2018). The highest frequencies of substance use among Jordanian nurses to cope with stressful situations were for coffee, analgesic drugs, cigarette smoking, and power drinks (Jarrad et al.,

2018). The current study was conducted during the COVID-19 pandemic. During the pandemic, nurses have been imposed to encounter contagion, lack of nursing staff, social isolation, and numerous other job and health difficulties that have greatly put them under considerable stress. Increased nurses' stress potentially made them use substances, which has disrupted nurses' emotional well-being and QoL (Arble et al., 2023).

The current study showed that substance use is the only coping strategy which partially mediated the correlation between stress perception and QoL among registered nurses. In other words, registered nurses who felt distressed and then practiced substance use as a coping strategy had lower levels of QoL. The results of the current study were inconsistent with the results of other studies that investigated the mediating roles of coping strategies. Previous studies have found that adaptive coping strategies, such as accepting responsibilities, planning, and religion, have mediated the relationship between stress and the dimensions of QoL in different populations, such as breast-cancer patients, parents of children with autism, and Italian rescue workers (Dardas & Ahmad, 2015; Prati et al., 2011). This inconsistency may be explained by that nurses appraised and used coping resources that were available during the pandemic. They may have been disable to use coping strategies that are typically done outdoor, such as social support, because of restrictions and lockdowns.

During the pandemic, nurses may have greatly used substances which were easily accessible and available, such as coffee, power drinks, analgesics, and cigarettes, to relieve pandemic-related stress and emotional or physical pain. Further, they may have used these substances to boost performance; for example, when having stimulants, such as coffee and power drinks, they stay awake and energetic during night shifts. These behaviors will progressively turn into dependence, affecting health and QoL (Arble et al., 2023).

The current study showed that substance abuse partially mediated the relationship between perceived stress and quality of life in Jordanian registered nurses. Partial mediation indicated that other variables, which were not measured, may mediate the relationship between perceived stress and QoL. For instance, self-efficacy was found to mediate the relationship between perceived stress and QoL or health in Spanish nurses during the COVID-19 pandemic (Peñacoba et al., 2021).

Thus, self-efficacy as a possible mediator in such relationship should be explored in future research.

Although the results of this study are of great benefits by filling out a gap in literature, the study had other limitations that should be taken into consideration in future research. Firstly, because of the cross-sectional study design, causal relationships between the study variables were not supported. Secondly, there were many confounding factors, such as coping strategies that were not included and examined in our study design, limiting internal validity. Thirdly, the convenience-sampling method was used in this study, resulting in findings that were not necessarily representative of the study population. Fourthly, the study data was collected using self-report questionnaires, which may have led to response biases, negatively affecting validity.

Implication for Nursing

The study results revealed that perceived stress was negatively correlated with quality of life among Jordanian registered nurses. The study shed light on the importance of managing registered nurses' stress to promote their QoL. In the 21st century, health-care systems worldwide are seeking to deliver high-quality care, improve patient satisfaction, and decrease nurses' turnover. However, these endeavors are impossible to happen if we have nurses with a low QoL. Understanding the determinants of low QoL in nurses, such as stress and coping strategies during difficult situations like pandemics, will help develop effective holistic programs aiming to improve nurses' QoL (Kelbiso et al., 2017).

The results also showed that religion and then substance use were commonly used by nurses as coping strategies more than other coping strategies. The results can be used by hospital administrators and decision makers as an empirical basis for planning and implementing effective coping strategies to manage nurses' stress other than those strategies that are maladaptive, such as substance use. It is also essential to inform decision makers in health-care settings in Jordan about the importance of developing and using stress-reduction programs for Jordanian nurses based on the coping strategies used by them during pandemics. Continuous-development departments in Jordanian health-care settings are in charge to conduct educational workshops that strengthen the resilience of nurses in their workplaces by using adaptive coping strategies

rather than non-adaptive ones, such as substance abuse. This will contribute to build a good work environment and achieve organizational goals effectively.

In nursing educational institutions, the findings of this study should inform decision makers in these institutions about the importance of integrating stress-reduction programs in nursing curricula which are based on adaptive coping strategies. This will help nursing students strengthen their resilience before entering the work environment. Also, nursing faculties in Jordan should be proactive in addressing nursing students' stress negatively affecting QoL. Nursing students are the future of the nursing profession. If nursing faculties do not take reasonable and realistic steps to help students manage the overwhelming demands of the nursing profession, the nursing profession could fail to thrive (Brook, 2021). With the nursing profession facing continuing pressures to recruit and retain nurses, nursing faculty members and administrators should assume more responsibility to help nursing students early be aware of the importance of using resilience-based stress-reduction programs that will help them manage their stress in the future when they enter the workplace.

Conclusion

To the best of the authors' knowledge, the current study may be the first to examine the mediation effect of various coping strategies on the correlation between stress perception and QoL in Jordanian registered nurses during the COVID-19 pandemic. The results of the current study showed that religion, and then substance abuse were the most common coping strategies used by Jordanian registered nurses. Also, the current-study results revealed that only substance abuse partially mediated the effect of stress perception on QoL in such population. In other words, registered nurses who felt distressed and then experienced substance use as a coping strategy had lower levels of QoL. Thus, hospital administrators and decision makers should plan and implement effective coping strategies to manage nurses' stress other than those strategies that are maladaptive, such as substance use.

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Conflict of Interests

There is no actual or potential conflict of interests' including any financial, personal or other relationships with other people or organizations that could inappropriately influence or be perceived to influence our work.

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