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Examination the Relationship Between Coping Style and Cognitive Distortion's (individual Negative Beliefs about Covid-19) with Perceived Stress in Zahedan Medical Staff (Iran)

Ali Reza Ganjali[1], Behzad Rigi[2*], Anita Onagh[3], Hossein Ansari[4], Javad Nadimi[5]

[1] Instructor of Clinical Psychology, School of Medicine, Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran. E-mail: *javadnadimi@gmail.com*

[2] **Corresponding author*, Assistant Professor, Cellular and Molecular Research Center, Department of Clinical Psychology, School of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran. E-mail: *brkpsycho1988@gmail.com*

[3] General Practitioner, Department of General Medicine, School of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran. E-mail: *brkpsycho1988@yahoo.com*

[4] Professor of Epidemiology, Department of Biostatistics and Epidemiology, School of Health, Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran. E-mail: *b.rigi1367@gmail.com*

[5] Ph.D. Student of Clinical Psychology, Department of Clinical Psychology, School of Medicine, Shahid Beheshti University of medical sciences, Tehran, Iran. E-mail: *j.nadimi.psy@gmail.com*

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A B S T R A C T

The COVID-19 pandemic emerged at the end of 2019 and has continued to affect people around the world, which makes it important to understand the factors that shape how individuals respond to the disease. This study examined how coping styles and cognitive distortions (negative beliefs about COVID-19) are related to perceived stress among medical staff in Zahedan, Iran. In this cross-sectional study, 342 staff members from hospitals affiliated with Zahedan University of Medical Sciences were recruited through quota and convenience sampling in 2022–2023 and completed a questionnaire battery. Data were analyzed with independent-samples t – test, one-way analysis of variance (ANOVA), Pearson correlations, and multiple linear regression. The mean perceived stress score was 47.3 (SD = 14.4), the mean coping score was 77.3 (SD = 23.4), and the mean cognitive distortions score was 67.1 (SD = 17.7). Perceived stress differed by gender, $t(340) = -6.14$, $p < .001$, and by job position, $F(2, 339) = 19.96$, $p < .001$. Perceived stress correlated negatively with both coping style scores and cognitive distortion scores (higher scores on the latter indicate more adaptive thinking), and both associations remained significant after adjustment for gender and job position. These findings suggest that stronger coping skills and more adaptive thinking are linked to lower stress, and that training in stress management and in recognizing cognitive distortions may help reduce stress among medical staff.

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Introduction

Since late 2019, a novel member of the coronavirus family, SARS-CoV-2, has threatened human societies and even animals. The concern arises because this is the third time in two decades that viruses of this family have brought a deadly epidemic to the world (Wilson & Chen, 2020). Coronavirus disease 2019 (COVID-19) is the infection caused by SARS-CoV-2. It was first reported in December 2019 as a coronavirus-associated pneumonia in Wuhan, China, and on January 30, 2020, the World Health Organization (WHO) declared the outbreak a Public Health Emergency of International Concern (Huang et al., 2020). Since then, the disease has been regarded as a danger to both the lives and the mental health

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of millions of people worldwide (Eyni et al., 2021). Protecting mental health is therefore essential, because people in every segment of society may face a variety of stressors as COVID-19 spreads. In such a high-risk situation, it is vital to identify those whose mental health may be endangered, together with the ways they cope with stressful conditions, so that suitable psychological strategies and techniques can help preserve their well-being (Lai et al., 2020). Stress is a reaction to a real or imagined threat to a person's psychological, physical, emotional, or spiritual well-being, and it triggers a chain of responses and physiological adaptations. Work is one source of stress in life, and occupations that involve more contact with other people tend to carry higher stress levels (Latifzadeh & Zarea, 2015; Moghadam et al., 2014). Among the many professions, healthcare workers, that is, people who deliver medical services in hospitals or health centers, face greater pressure and a higher risk of psychological harm because they encounter numerous stressors (Parvin et al., 2005).

Beyond the routine occupational stress experienced by healthcare personnel, the COVID-19 outbreak increased patient visits and hospital admissions of infected individuals and therefore added to staff workloads. Healthcare workers were also more likely than other groups to contract the disease. Together, these factors threatened the mental health of the healthcare community and raised its stress (Chekole et al., 2020; Uvais et al., 2020). Assessing stress levels and the factors that influence them during the pandemic can support the effective management of mental health (Talevi et al., 2020). Coping styles are one potentially important influence on mental health and stress (Weiss, 2008). They refer to people's ongoing efforts to adapt to situations that upset their balance; when effective coping styles are used, emotions are regulated and stress is eased (Zupiria Gorostidi et al., 2007). Effective problem solving, sufficient experience, an adequate support system, enough sleep and personal hygiene, and a balanced lifestyle all promote effective coping. People who cannot cope effectively experience more stress, and the resulting maladjustment leads to psychological problems and disorders. Ineffective coping is a main cause of many psychological problems (Barry & Farmer, 2002).

Cognitive distortions are exaggerated, rigid, irrational, and absolute beliefs; when people think irrationally, they perceive life events differently from how those events really are (Ashori et al., 2019). The term also covers cognitive errors and biases, namely the way people appraise situations and psychological stressors, their views of themselves, the world, and the future, and the beliefs and attitudes that heighten their vulnerability to emotional disorders. When distortions recur and persist over time, they lead to psychological distress and disorders, and they are associated with many illnesses. Accurate, reality-based cognition is essential for discovering the truth and understanding the different dimensions of life, whereas a lack of awareness, mistaken awareness, and distorted cognition lead people to misjudge life events. These errors affect how people adapt to the world around them and to life in general, and thereby their quality of life. Satisfaction, tranquility, and quality of life are directly tied to thinking processes (Ansari Shahidi & Zamani, 2017). Behavioral restrictions such as quarantine and the loss of contact with family and friends generate stress and cognitive distortions, which in turn alter cognitive domains such as perceived stress, working memory, attention, decision making, and problem solving (Pourfarrokh et al., 2020).

Mental health is a key indicator of the health of societies and contributes substantially to a community's efficiency. The WHO defines health as a state of complete physical, mental, and social well-being rather than merely the absence of disease or disability (Pourfarrokh et al., 2020). Because healthcare personnel were exposed to COVID-19-related stress and anxiety during the pandemic, studying their coping skills is important for protecting the mental health of medical center staff. Although the spread of COVID-19 has declined, the lessons of this pandemic can guide future preparedness and help reduce neuropsychiatric complications among healthcare workers. Given the lack of earlier research on this question in this setting, the present study aimed to determine the relationships of coping styles and cognitive distortions (individuals' negative beliefs about COVID-19) with perceived stress among healthcare personnel in Zahedan during 2022–2023.

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Method

Design and participants

This descriptive–analytical, cross-sectional study targeted healthcare personnel working in hospitals affiliated with Zahedan University of Medical Sciences in 2022–2023. Individuals were eligible if they gave informed consent, answered every questionnaire item, and had at least one year of work experience in a Zahedan hospital. Exclusion criteria were unwillingness to continue participating, the loss of a first-degree relative during the study period, current use of psychiatric medication, a psychiatric disorder diagnosed and confirmed by a specialist, and participation in psychological training programs. Three conditions were treated as potential confounders: the loss of a first-degree relative to COVID-19, current use of psychiatric medication, and a clinically diagnosed psychiatric disorder. Because these conditions could influence psychological outcomes and bias the findings, people who had them were excluded. The Ethics Committee of Zahedan University of Medical Sciences approved the study protocol (Approval Code: IR.ZAUMS.REC.1402.384).

Sample and Sampling Method

The required sample size was calculated from a previous study (Li et al., 2021). Assuming a standard deviation of 7.5 for perceived stress scores, a Type I error rate of .05, and a maximum acceptable difference of $d = 0.8$, the minimum sample was estimated at 342 participants (Cai et al., 2020). Quota sampling was used, in proportion to the distribution of personnel across hospitals and occupational categories. The hospital strata were Ali-Ibn-Abi-Talib Hospital, Khatam-al-Anbia Hospital, and Bu-Ali Hospital, and the occupational strata were physicians, nurses, and other healthcare personnel. Within each stratum, participants who met the inclusion criteria were selected by convenience sampling.

Tools Used

Data were collected with a four-part questionnaire. The first part covered demographic characteristics: age, gender, occupational category (physician, nurse, laboratory staff, anesthesia technician, midwife, or other), and educational level. The remaining parts comprised the Perceived Stress Scale (PSS), the Coping Inventory for Stressful Situations–Short Form (CISS-SF), and the Cognitive Distortions Questionnaire.

Perceived Stress Scale

The PSS was developed by Cohen et al. (1983). It contains 16 items that measure perceived stress over the previous month, tapping individuals' perceptions and feelings about stressful events, perceived control, coping ability, and psychological pressure. Items are rated on a 5-point Likert scale from 0 (*never*) to 4 (*very often*), and Items 4, 5, 6, 7, 9, 10, and 13 are reverse scored before the total is computed. Total scores range from 0 to 64, with higher scores indicating greater perceived stress. The validity and reliability of the Persian version were examined by Behroozi et al. (2013), who reported a Cronbach's alpha of .73 and a split-half reliability of .74. Construct validity, assessed by correlating the scale with a researcher-developed criterion question, was .63 (Behroozi et al., 2013; Cohen et al., 1983).

Coping Inventory for Stressful Situations–Short Form

The CISS-SF was developed by Endler and Parker (1999) and translated into Persian by Akbarzadeh (1997). It has 21 items, seven for each of three coping styles: avoidance-oriented coping (Items 1, 4, 7, 9, 15, 18, and 21), problem-focused coping (Items 2, 6, 8, 11, 13, 16, and 19), and emotion-focused coping (Items 3, 5, 10, 12, 14, 17, and 20). Responses are given on a 5-point Likert scale from 1

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(*never*) to 5 (*always*). Each subscale score ranges from 7 to 35, and higher scores indicate greater use of that coping strategy (Endler & Parker, 1999). Reliability is high (Cronbach's α = .81), and validity has been confirmed in Iranian studies. The correlation coefficients reported for the subscales were .58 for problem-focused coping, .55 for emotion-focused coping, and .93 for avoidance coping (Kakabaraei et al., 2012).

Cognitive Distortions Questionnaire

This questionnaire has 20 items that assess cognitive distortions according to Ellis's theoretical framework and is intended to identify irrational thinking patterns that can contribute to psychological distress and maladaptive emotional reactions. Responses are given on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*), so total scores range from 20 to 100. Lower scores indicate a stronger tendency toward cognitive distortions, whereas higher scores reflect more adaptive thinking. Reliability was evaluated through internal consistency and two-week test–retest reliability, which yielded a coefficient of .77 (Ashori et al., 2019).

Data Analysis

Data were analyzed with SPSS Version 26. Before the inferential analyses, data quality and distributions were checked with graphical methods and descriptive indices. Categorical variables were summarized as frequencies and percentages, and quantitative variables as means and standard deviations. Independent-samples *t* tests were used to compare scores between the two gender groups, and one-way analysis of variance (ANOVA) was used to compare scores across the three job-position groups. Pearson correlation coefficients were calculated to examine relationships among the study variables. In addition, multiple linear regression was used to evaluate whether coping styles and cognitive distortions predicted perceived stress after accounting for demographic variables. Statistical significance was set at $p < .05$.

Results

In total, 342 healthcare personnel from Ali Ibn Abi Talib Hospital, Khatam al Anbia Hospital, and Bu Ali Hospital in Zahedan who met the inclusion criteria and consented to take part were enrolled through quota and convenience sampling. Participants were assessed on coping styles, cognitive distortions, and perceived stress. Participants' mean age was 39.8 years (SD = 9.8, range = 21–58). Of the 342 participants, 231 (67.5%) were women and 111 (32.5%) were men. By occupation, 221 (64.6%) were nurses, 42 (12.3%) were physicians, and 79 (23.1%) belonged to other professional groups, including laboratory sciences, radiology, and anesthesia personnel. Regarding education, 51 participants (14.9%) held doctoral degrees, 243 (71.0%) held bachelor's degrees, and 48 (14.1%) held associate degrees. Total PSS scores can range from 0 to 64, with higher scores signifying greater perceived stress over the previous month. The mean perceived stress score was 47.3 (SD = 14.4, range = 22–59). Using the predefined classification, stress was high in 102 participants (29.8%), moderate in 152 (44.5%), and low in 88 (25.7%).

Table 1 – *Perceived Stress by Gender and Job Position*

Variable	Group	*n*	*M*	*SD*	Test statistic	*p*
Gender	Male	111	43.3	12.3	$t(340) = -6.14$	< .001
	Female	231	52.5	13.3		
Job position	Physician	42	42.5	12.9	$F(2, 339) = 19.96$	< .001
	Nurse	221	54.3	14.3		
	Other staff	79	46.1	11.6		

Note. Perceived stress was measured with the Perceived Stress Scale (possible range 0–64). Gender differences were tested with an independent-samples *t* test and job-position differences with a one-way ANOVA.

Table 1 shows perceived stress by gender and job position. An independent-samples *t* test indicated that men ($M = 43.3$, $SD = 12.3$) reported significantly lower stress than women ($M = 52.5$, $SD = 13.3$), $t(340) = -6.14$, $p < .001$, Cohen's $d = -0.71$, mean difference = -9.20, 95% CI [-12.15, -6.25]. A one-way ANOVA also showed that perceived stress differed significantly across job positions, $F(2, 339) = 19.96$, $p < .001$, $\eta^2 = .11$. Women and nurses reported higher mean stress than the other groups.

Table 2 – *Coping Style Scores by Gender and Job Position*

Variable	Group	*n*	*M*	*SD*	Test statistic	*p*
Gender	Male	111	77.9	22.3	$t(340) = -0.23$	.822
	Female	231	78.5	23.4		
Job position	Physician	42	79.9	22.9	$F(2, 339) = 0.30$	.740
	Nurse	221	77.8	24.7		
	Other staff	79	76.4	21.1		

Note. Coping styles were measured with the Coping Inventory for Stressful Situations–Short Form (possible range 21–105). Gender differences were tested with an independent-samples *t* test and job-position differences with a one-way ANOVA.

As shown in Table 2, coping scores did not differ significantly by gender, $t(340) = -0.23$, $p = .822$, $d = -0.03$, or by job position, $F(2, 339) = 0.30$, $p = .740$, $\eta^2 = .002$.

Table 3 – *Cognitive Distortion Scores by Gender and Job Position*

Variable	Group	*n*	*M*	*SD*	Test statistic	*p*
Gender	Male	111	75.1	19.1	$t(340) = 5.30$	< .001
	Female	231	63.9	17.9		
Job position	Physician	42	78.2	18.8	$F(2, 339) = 23.11$	< .001
	Nurse	221	67.2	17.1		
	Other staff	79	55.9	19.1		

Note. Higher scores indicate more adaptive thinking (possible range 20–100). Gender differences were tested with an independent-samples *t* test and job-position differences with a one-way ANOVA.

Table 3 presents cognitive distortion scores by gender and job position. Scores differed significantly by gender, $t(340) = 5.30$, $p < .001$, $d = 0.61$, and by job position, $F(2, 339) = 23.11$, $p < .001$, $\eta^2 = .12$. Men and physicians obtained higher mean scores, which on this instrument indicates more adaptive thinking.

Table 4 – *Pearson Correlations between Perceived Stress and Coping Styles and Cognitive Distortions*

Variable	Coping styles	Cognitive distortions
Perceived stress, Pearson *r*	-.31	-.33
p	.005	.007
n	342	342

Note. $N = 342$.

Pearson correlations (Table 4) showed that perceived stress was negatively correlated with both coping style scores ($r = -.31$, $p = .005$) and cognitive distortion scores ($r = -.33$, $p = .007$) among healthcare personnel ($n = 342$).

Table 5 - *Multiple Linear Regression Predicting Perceived Stress*

Predictor	β	*SE*	95% CI	*p*
Gender				
Male	0.24	0.077	[0.094, 0.397]	.021
Female (reference)	1.00	-	-	-
Job position				
Nurse	0.187	0.033	[0.12, 0.25]	.031
Physician	-0.021	0.13	[0.013, 0.034]	.089
Other staff (reference)	-	-	-	-
Cognitive distortions	0.196	0.43	[0.11, 0.28]	.001
Coping styles	0.139	0.042	[0.05, 0.185]	.001

Note. CI = confidence interval. Reference categories were female and other staff.

A multiple linear regression was conducted to examine whether coping styles and cognitive distortions predicted perceived stress after controlling for gender and job position (Table 5). Cognitive distortion scores (β = 0.196, *SE* = 0.43, 95% CI [0.11, 0.28], *p* = .001) and coping style scores (β = 0.139, *SE* = 0.042, 95% CI [0.05, 0.185], *p* = .001) were both significant predictors of perceived stress. Among the demographic covariates, gender was significant: men differed from women (the reference group) in perceived stress (β = 0.24, *SE* = 0.077, 95% CI [0.094, 0.397], *p* = .021). Job position was also partly significant. Nurses differed from other staff (the reference group; β = 0.187, *SE* = 0.033, 95% CI [0.12, 0.25], *p* = .031), whereas physicians did not (β = -0.021, *SE* = 0.13, 95% CI [0.013, 0.034], *p* = .089). Overall, coping styles and cognitive distortions remained significantly associated with perceived stress after adjustment for gender and job position.

Discussion

This study examined perceived stress among healthcare personnel and its relationships with coping styles and cognitive distortions. Mean perceived stress was relatively high, and stress differed significantly by gender and job position, with women and nurses reporting higher stress than the other groups. The elevated stress may reflect the demanding nature of clinical settings, heavy workloads, contact with critically ill patients, and the psychological pressures built into healthcare work. Nurses, who typically spend long periods in direct contact with patients and their families, may face especially heavy emotional and occupational demands. Gender differences in stress may likewise reflect differences in job roles, emotional labor, and social expectations within healthcare workplaces. Coping scores were unrelated to gender or job position. This may mean that healthcare workers' coping strategies are shaped by factors other than demographics, such as individual psychological traits, professional experience, or workplace conditions. It is also possible that professionals in different roles meet similar stressors in hospital settings and therefore respond with comparable coping. Cognitive distortion scores differed significantly by gender and job position. Men and physicians scored higher, which on this instrument signals more adaptive thinking and a lower tendency toward distortion. Differences in cognitive appraisal and decision-making across occupational roles may partly explain this result. Physicians, for example, usually receive extensive training in analytic problem solving and clinical decision making, which may support more structured cognitive processing when they face stressful situations.

The correlation analysis showed that perceived stress was negatively related to both coping scores and cognitive distortion scores. In other words, people who reported using more coping strategies and who showed more adaptive thinking tended to report less stress. This finding agrees with theoretical models that stress the role of cognitive appraisal and coping in the experience of stress. According to these models, people who use more effective coping strategies and keep more adaptive thinking patterns are better able to handle stressful situations and regulate their emotional responses.

To examine these relationships further, multiple linear regression was run with gender and job position as covariates. Coping styles and cognitive distortions remained significantly associated with perceived stress after this adjustment, which suggests that cognitive and coping-related factors may play an important part

in how healthcare personnel experience stress. These findings should be read against the broader background of the COVID-19 pandemic. Since the pandemic began, the daily lives and functioning of the general population have been greatly affected. Healthcare workers, particularly those on the front line, have also faced added occupational stressors because of their direct exposure to infected patients and the demands of providing continuous care. These circumstances may increase psychological strain and disrupt personal, family, and work functioning more than in other social groups (Mahdizadeh et al., 2022). Earlier research also suggests that people under higher stress may have less capacity for emotional regulation and self-control. Under such conditions, they may find it harder to manage emotional reactions, choose suitable behavioral responses, and apply effective coping strategies. Elevated stress may consequently add to psychological pressure and maladaptive emotional reactions (Leclère et al., 2023; Yu et al., 2020).

Limitations

One practical limitation was the difficulty of recruiting participants, because some individuals were unwilling to cooperate with the research process. To address this, the objectives of the study and the potential benefits of taking part were explained to the relevant departments, which helped encourage cooperation in completing the questionnaires.

Conclusion

The findings indicate that greater use of coping strategies and more adaptive thinking are associated with lower perceived stress among healthcare personnel. They point to the potential importance of coping processes and cognitive appraisal in how stress is experienced in healthcare settings.

Given the demanding nature of healthcare work, especially during large-scale health crises such as the COVID-19 pandemic, attention to the psychological resources that help staff manage stress appears essential. Interventions that strengthen coping skills and promote more adaptive thinking may therefore support healthcare workers' psychological well-being. Further longitudinal and interventional studies are needed to clarify the direction and strength of these relationships.

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Informed Consent: All individual participants gave informed consent. Participation was voluntary and anonymous, and the confidentiality of responses was fully maintained.

Ethical Approval: The study protocol was reviewed and approved by the Research Ethics Committee of Zahedan University of Medical Sciences (Approval Code: IR.ZAUMS.REC.1402.384).

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