



# The Open Public Health Journal

Content list available at: <https://openpublichealthjournal.com>



## RESEARCH ARTICLE

### Stress Coping Styles in Family and Relatives of Coronavirus Disease 2019 (COVID-19) Patients in the South of Iran: Application of Lazarus and Folkman's Theory of Stress Coping

Reza Faryabi<sup>1</sup>, Tahereh Rahimi<sup>2</sup>, Salman Daneshi<sup>3</sup>, Ehsan Movahed<sup>1,\*</sup>, Ali Reza Yusefi<sup>1</sup>, Mohadeseh Shojaei Shahrokhbadi<sup>4</sup>, Ding-Geng (Din) Chen<sup>5</sup>, Saeedeh Azaraeen<sup>6</sup> and Cain C. T. Clark<sup>7</sup>

<sup>1</sup>Department of Public Health, School of Public Health, Jiroft University of Medical Sciences, Jiroft, Iran

<sup>2</sup>Department of Public Health, School of Public Health, Jahrom University of Medical Sciences, Jahrom, Iran

<sup>3</sup>Department of Public Health, School of Health, Jiroft University of Medical Sciences, Jiroft, Iran

<sup>4</sup>Department of Statistics, University of Pretoria, Pretoria, South Africa

<sup>5</sup>Department of Biostatistics, Gillings School of Global Public Health, University of North Carolina-Chapel Hill, North Carolina, USA

<sup>6</sup>Researcher of Jiroft University of Medical Sciences, Jiroft, Iran

<sup>7</sup>Centre for Intelligent Healthcare, Coventry University, Coventry, CV15FBUK

#### Abstract:

##### Background:

The ongoing outbreak of Coronavirus disease 2019 (COVID-19) is a major challenge for mental health care systems and causes and exacerbates mental anxiety.

##### Objective:

This study sought to investigate the coping styles of stress in families and relatives of COVID-19 patients in the south of Iran, according to Lazarus and Folkman's Transactional theory of Stress coping model.

##### Methods:

The present cross-sectional study was performed in the period from March 5 to July 5, 2020. Data collection was done electronically using a standard questionnaire on Lazarus and Folkman's coping methods. Finally, the output data of the electronic questionnaire were analyzed using descriptive and inferential statistics.

##### Results:

A total of 276 people participated in the present study. There was a statistically significant difference between age and all emotion-oriented coping style domains ( $P < 0.05$ ), except planful problem solving ( $P = 0.817$ ) and positive reappraisal ( $P = 0.153$ ). The results of the present study showed that from the emotion-oriented coping, the domain of self-controlling (55.9%) received an unfavorable score, but in the problem-oriented coping (60.02%), the two domains of social support (71.27%) and positive reappraisal (70%) obtained scores above 50%.

##### Conclusion:

Families and relatives need help to improve coping with stress in the area of self-controlling. The results of the present study showed that emotion-oriented coping (self-controlling) had less effect on family stress than problem-oriented coping (domains of social support and positive reappraisal). Also, with domains of social support and positive reappraisal, the stress in the families was reduced. Factors influencing coping styles were age, literacy, source of information, and underlying disease. Since the COVID-19 pandemic condition is a unique stressful situation, it is necessary to implement psychological and educational interventions to gain the ability to control stress, especially in relatives with COVID-19.

**Keywords:** Psychological distress, Coronavirus disease 2019, Family, Psychologic theory, Folkman's coping methods, Covid 19.

#### Article History

Received: March 22, 2022

Revised: April 27, 2022

Accepted: June 17, 2022

## 1. INTRODUCTION

The rapid spread of COVID-19, severe infection, death in severe cases, and the lack of specific drugs for treatment pose a threat to human life and health, and also have a great impact on mental health, while individuals differ in the degree of emotional problems. Therefore, it can be predicted that the prevalence of COVID-19 would contribute to general psychological reactions, such as stress, anxiety, and fear, facilitating mental disorders, such as acute stress disorder, post-traumatic stress disorder, depression, and suicide [1, 2]. Although infectious diseases produce a wide range of emotional responses, not all people experience the same amount of emotional impact and have different coping strategies, as people did during the MERS-CoV outbreak in which perceived stressors and coping strategies were different [1].

Stress is the physiological response of the body to any kind of change, threat, or internal and external pressure, that causes mental imbalance, and stress is an inevitable event in everyone's life [3]. In COVID-19, as a potential source of psychological crises, stressors can include longer quarantine, fear of infection, frustration, boredom, insufficient resources, insufficient information, financial loss, and fear of being labeled [4]. Also, intervention in psychological crises should include two simultaneous activities: (1) intervention for fear of illness and (2) intervention for adaptation problems to prevent and manage violence and suicidal behaviors [5]. Therefore, awareness of psychological reactions and perceptions among the general public during an epidemic can determine the severity of the risk and the need for mental health interventions [6]. Therefore, before implementing interventions, it is necessary to examine the status of the effect of stressors on individuals and how people adapt to these stressors. One of the models that examine the adaptation of people to stressors is the transactional stress model of Lazarus and Folkman. The Folkman transactional model has the structures of primary evaluation, secondary evaluation, stress, and adaptation. In discussing the initial assessment, the individual may assess the situation as threatening or, conversely, harmless. The second stage, or secondary evaluation, examines the type of action that the individual should take about that situation or environment. The sense of danger and the extent of it depends on the possibilities that the person feels they have, and this is related to the information that the environment, life experiences, and personal characteristics have yielded. New information may be effective in reassessing a person's situation and re-evaluating it. Indeed, in Trougakos *et al.*, the authors examined the stress and anxiety caused by COVID-19 using Lazarus and Folkman's Transactional theory and the theory of self-determination at work, home and health [7]. Their model predicts that a form of problem-focused coping will mitigate the effects of COVID-19 anxiety. Additionally, according to Trougakos, anxiety and stress due to Covid-19 were found to impair critical work (goal progress), home (family engagement) and health (somatic complaints) causing increased emotional suppression and lack of psychological need fulfillment.

Thus, the main assumption of the Lazarus-Folkman interactive model is that primary assessment, secondary assessment, and coping strategies mediate between stressors and the consequences of stress in individuals [8, 9]. The results of Morowatisharifabad *et al.*, who used the Lazarus and Folkman model on stress in hemodialysis patients showed the subcategories of perceived susceptibility, perceived severity, and casual focus were the most effective factors in the stress appraisal in HD patients. Indeed, patients need help to improve their evaluation in subcategories of motivational relevance, perceived control over outcomes, perceived control over emotion, and self-efficacy. In this regard, one of the best models that can be used to identify the appraisals in patients is Lazarus and Folkman's Transactional theory [10]. The study by Anderson *et al.* copes with aging [11] and the studies by Ma *et al.* [12]. and Crowe BM *et al.* [13] cope with stressful work conditions and job motivation, emphasizing the effect of Lazarus and Folkman's transactional theory on stress. Thus, past studies in different countries show that Lazarus and Folkman's transactional theory can be effective against stress in different situations, places and people.

In Wang's study, 16% of participants in the study had moderate to severe depression. About 28.8% had moderate to severe anxiety and 18% had moderate to severe stress due to the psychological impact of COVID-19. In Huang's study, the closer COVID-19 was to participants (contact with patients), the stronger the anxiety and anger. In the Al-Rabiaah's study, stress levels were significantly related to generalized anxiety disorder [1, 2]. There is currently limited information on factors pertaining to how people cope with the stress of the COVID-19 epidemic, especially based on psychological theories. Moreover, there is no study regarding the adaptation of stress in those around the patient using the interactive stress model of Lazarus and Folkman, therefore, this study sought to investigate the coping styles of stress in families and relatives of COVID-19 cases in the south of Iran, according to Lazarus and Folkman's Transactional Theory of Stress coping model.

## 2. MATERIALS AND METHODS

### 2.1. The Study and Setting

This cross-sectional study was performed on the relatives of patients with COVID-19 between the period of March 5 to July 5, 2020.

### 2.2. Sampling

This study was performed on 276 participants. The inclusion criteria for the study participants were having COVID-19, patients' family members, and relatives in the South of Iran.

### 2.3. Data Collection

Data collection was done virtually in 7 cities in the south of Kerman province, Iran. The demographic questionnaire and standard questionnaire on Lazarus and Folkman's coping methods, which consisted of 66 questions, were used electronically to collect data. The purpose of this questionnaire is to assess people's thoughts and actions to cope with stressful

\* Address correspondence to this author at the Department of Public Health, School of Public Health, Jiroft University of Medical Sciences, Jiroft, Iran; Tel: 0989133908319; E-mail: ehsanmovahed89@yahoo.com

life events. In the Lazarus and Folkman questionnaire, the answers are of the four-choice Likert type and it includes I did not use (score zero), I used to some extent (score 1) I used it most of the time (score 2) and I used it a lot (score 3). This questionnaire includes eight domains of confronting coping (score 0 to 18), distancing and positive reassessment (scores 0 to 21). The domains confronting coping, distancing, self-controlling, and escape-avoidance are related to the emotion-centered coping styles considered undesirable, and the areas of seeking social support, accepting responsibility, planful problem solving, and positive reassessment are problem-oriented coping styles. To calculate the scores in each domain in the case of problem-oriented coping style domains, a score of less than 50% achievable score was considered weak, between 50 to 75% of the average achievable score was moderate and a score above 75% of the achievable score was considered good. Also, to classify the scores in each domain for the areas of emotion-oriented coping styles, obtaining a score less than 50% of the achievable score yielded a classification of 'well', between 50 to 75% was 'moderate', and obtaining a score above 75% was considered 'weak'. In Alipour *et al.*, the reliability of this assessment was 0.85 [14]. In the Folkman and Lazarus study, the internal consistency was 0.75, and the reliability of its subdomains was 0.61 for distancing coping style, and up to 0.79 for positive reappraisal [15]. Also, in the research of Agha Yousefi *et al.*, the reliability of the questionnaire was calculated in the sample using Cronbach's alpha and a coefficient of 0.76 was obtained, which indicates the high reliability of the questionnaire [16].

#### 2.4. Ethics Approval

This project acquired ethical committee approval from the Jiroft university of medical science (IR.JMU.REC.1399.003).

All research was conducted in accordance with the ethical standards of the Institutional Research Committee and with the 1964 Helsinki declaration and its latest amendment.

#### 2.5. Statistical Analysis

The output data of the electronic questionnaire were

entered into SPSSv18 software and analyzed using descriptive statistical tests, independent t-test, and ANOVA.

### 3. RESULTS

Overall, 276 people participated in the study, and 67.8% of them were in the age group of 41-60 years. The majority of participants in the study (51.8%) were women, and the occupation of the majority (72.1%) was recorded as employees. In terms of education, 47.1% had a diploma, 92.4% were married, and 69.9% lived in the city. Regarding the symptoms of the disease, the highest percentage was related to asymptomatic (34.8%), followed by fever (33.7%), shivering (23.9%), cough (15.2%), and apnea (13.8%).

Regarding the underlying disease, the highest percentage was related to the absence of underlying disease (48.6%), blood pressure (25.7%), cardiovascular disease (19.9%), diabetes (14.1%), and respiratory disease (10.1%) (Table 1).

Regarding the underlying disease, the highest percentage was related to the absence of underlying disease (48.6%), blood pressure (25.7%), cardiovascular disease (19.9%), diabetes (14.1%), and respiratory disease (10.1%). (Table 1).

The domains of seeking social support, positive reappraisal, and self-controlling, with an average percentage above 50%, had the highest scores in Table 2. In terms of the difference in the mean score of domains related to emotion-oriented coping style, according to some specific variables in this study, there was a significant difference between age and all domains, except emotion-oriented coping style itself, literacy, and self-controlling ( $P < 0.05$ ) (Table 3).

In terms of the difference in the mean score of areas related to problem-oriented coping style, there were significant differences ( $P < 0.05$ ) related to age and seeking social support and accepting responsibility, literacy and all domain and the problem-oriented coping style itself, source of information and all domain and problem-oriented coping styles itself, symptoms of disease and accepting responsibility, planful problem solving positive reappraisal and problem-oriented coping styles, smoking and planful problem solving positive reappraisal, and problem-oriented coping styles, (Table 4).

**Table 1. The status of the underlying diseases in the participating.**

Variable	N	%
Absence of underlying disease	134	48.6
Diabetes	39	14.1
Cancer	7	2.5
Hypertension	71	25.7
Heart disease	55	19.9
Respiratory disease	28	10.1
Organ transplants	6	2.2

Table 2. The status of the score obtained base on the Lazarus and Folkman's questionnaire in participants.

Variable	Mean	SD	Score Range	Average Percentage
Confrontive coping	7.39	3.17	0-8	41.05
Distancing	8.10	3.54	0-18	45
Self-controlling	11.75	4.37	0-21	55/95
Seeking social support	12.83	3.99	0-18	71.27
Accepting responsibility	4.49	3.01	0-12	41.37
Escape-avoidance	8.72	4.91	0-24	33.36
Planfull problem solving	11.42	5.72	0-21	38.54
Positive reappraisal	12.66	3.54	0-18	70
Emotion- oriented coping style	35.94	11.28	0-81	37.44
Problem- Orientes coping style	41.42	11.79	0-69	60.02
Coping styles	77.36	20.34	0-150	57.51

Table 3. Status of emotion-oriented coping style domains base on the demographic variables in patients with Covid-19 disease.

Variable	Groups	Confronting Coping	Distancing	Self-controlling	Escape-avoidance	Emotion- oriented Coping Style
		Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
Age	20-40	6.48 $\pm$ 2.10	7.38 $\pm$ 2.23	13.36 $\pm$ 3.69	6.46 $\pm$ 3.57	24.03 $\pm$ 6.43
	41-60	7.81 $\pm$ 3.49	8.48 $\pm$ 3.95	11.05 $\pm$ 4.46	9.78 $\pm$ 5.09	37.02 $\pm$ 12.85
	61 and above	6.69 $\pm$ 2.21	6.84 $\pm$ 2.64	12.30 $\pm$ 4.28	5.76 $\pm$ 4.06	31.61 $\pm$ 6.29
<b>P-value</b>		0.006	0.031	0.000	0.000	0.055
Literacy	Under diploma	7.42 $\pm$ 3.04	7.98 $\pm$ 4.12	11.23 $\pm$ 4.39	9.28 $\pm$ 4.65	35.89 $\pm$ 11.51
	Diploma	7.63 $\pm$ 3.69	8.28 $\pm$ 3.77	10.90 $\pm$ 4.32	9.52 $\pm$ 5.45	36.33 $\pm$ 12.87
	Bachelor and less	6.95 $\pm$ 2.35	7.91 $\pm$ 2.43	10.28 $\pm$ 3.33	7.17 $\pm$ 3.34	36.17 $\pm$ 7.55
	Masters and above	7.33 $\pm$ 2.19	7.90 $\pm$ 3.61	10.28 $\pm$ 4.83	7.33 $\pm$ 5.15	32.90 $\pm$ 10.42
<b>P-value</b>		0.568	0.881	0.000	0.005	0.637
Source of information	Healthcare staff	7.86 $\pm$ 3.09	9.06 $\pm$ 3.58	11.72 $\pm$ 4.34	9.58 $\pm$ 4.73	38.31 $\pm$ 11.33
	Social networks	6.71 $\pm$ 1.93	7.33 $\pm$ 2.23	13.50 $\pm$ 3.52	6.39 $\pm$ 3.10	34.01 $\pm$ 6.42
	Radio and TV	7.77 $\pm$ 3.66	8.41 $\pm$ 4.10	10.68 $\pm$ 4.39	10.02 $\pm$ 5.10	36.82 $\pm$ 12.98
	Friends and acquaintances	7.26 $\pm$ 3.92	8.26 $\pm$ 4.10	10.39 $\pm$ 5.24	9.34 $\pm$ 6.54	35.17 $\pm$ 15.35
	Read books and newspapers	8.14 $\pm$ 3.80	8.00 $\pm$ 3.87	12.42 $\pm$ 4.54	10.71 $\pm$ 5.67	38.42 $\pm$ 12.29
<b>P-value</b>		0.112	0.000	0.096	0.000	0.270
Marital status	Married	7.42 $\pm$ 3.24	8.15 $\pm$ 3.62	11.54 $\pm$ 4.45	8.95 $\pm$ 4.99	36.03 $\pm$ 11.64
	Single	7.07 $\pm$ 2.13	7.41 $\pm$ 2.29	14.28 $\pm$ 1.84	6.00 $\pm$ 2.54	34.80 $\pm$ 5.33
<b>P-value</b>		0.599	0.401	0.005	0.008	0.632
Underlying disease	No	7.00 $\pm$ 3.11	7.61 $\pm$ 3.54	12.21 $\pm$ 4.52	7.92 $\pm$ 4.45	33.72 $\pm$ 10.70
	Yes	7.82 $\pm$ 3.19	8.61 $\pm$ 3.48	12.32 $\pm$ 4.14	9.57 $\pm$ 5.24	38.29 $\pm$ 11.44
<b>P-value</b>		0.031	0.020	0.035	0.005	0.001
Disease symptoms	No	7.13 $\pm$ 2.84	7.41 $\pm$ 3.07	10.11 $\pm$ 4.24	8.58 $\pm$ 4.46	33.32 $\pm$ 8.67
	Yes	7.53 $\pm$ 3.33	8.43 $\pm$ 3.37	12.62 $\pm$ 4.19	8.80 $\pm$ 5.14	37.34 $\pm$ 12.25
<b>P-value</b>		0.315	0.030	0.000	0.721	0.005
Mental illness	No	7.01 $\pm$ 2.80	7.95 $\pm$ 3.50	11.11 $\pm$ 4.38	9.15 $\pm$ 5.02	35.44 $\pm$ 11.27
	Yes	7.97 $\pm$ 3.58	7.32 $\pm$ 3.16	12.96 $\pm$ 4.19	8.09 $\pm$ 4.69	36.69 $\pm$ 11.31
<b>P-value</b>		0.013	0.393	0.003	0.081	0.367
Smoking	No	7.28 $\pm$ 3.24	7.58 $\pm$ 3.57	11.30 $\pm$ 4.40	8.86 $\pm$ 4.91	35.34 $\pm$ 11.49
	Yes	7.93 $\pm$ 3.73	9.40 $\pm$ 3.13	14.09 $\pm$ 3.34	8.02 $\pm$ 4.92	39.09 $\pm$ 9.63
<b>P-value</b>		0.187	0.007	0.000	0.300	0.044

**Table 4. Status of problem-oriented coping style domains base on the demographic variables in patients with Covid-19 disease.**

Variable	Groups	Seeking Social Support	Accepting Responsibility	Planfull Problem Solving	Positive Reappraisal	Problem-oriented Coping Style
		Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
Age	20-40	13.01 $\pm$ 2.63	5.75 $\pm$ 2.16	11.77 $\pm$ 4.62	13.30 $\pm$ 2.78	43.84 $\pm$ 9.12
	41-60	13.03 $\pm$ 4.19	4.03 $\pm$ 3.19	11.28 $\pm$ 6.04	12.38 $\pm$ 3.83	40.73 $\pm$ 12.77
	61 and above	8.92 $\pm$ 5.66	3.84 $\pm$ 2.47	11.30 $\pm$ 7.01	13.00 $\pm$ 2.73	37.07 $\pm$ 8.71
<b>P-value</b>		0.001	0.000	0.817	0.153	0.061
Literacy	Under diploma	11.59 $\pm$ 5.18	3.80 $\pm$ 2.68	10.17 $\pm$ 6.10	12.21 $\pm$ 3.77	37.78 $\pm$ 11.51
	Diploma	12.91 $\pm$ 4.10	3.90 $\pm$ 3.06	11.07 $\pm$ 5.73	12.28 $\pm$ 3.52	40.18 $\pm$ 12.35
	Bachelor and less	13.25 $\pm$ 2.22	5.76 $\pm$ 2.48	12.41 $\pm$ 4.89	13.27 $\pm$ 3.11	44.70 $\pm$ 9.93
	Masters and above	14.38 $\pm$ 3.26	5.90 $\pm$ 3.49	13.71 $\pm$ 6.23	14.28 $\pm$ 3.73	48.27 $\pm$ 9.67
<b>P-value</b>		0.023	0.000	0.034	0.030	0.000
Source of information	Healthcare staff	13.57 $\pm$ 3.42	3.82 $\pm$ 2.60	13.82 $\pm$ 6.38	13.48 $\pm$ 3.62	44.89 $\pm$ 11.16
	Social networks	12.00 $\pm$ 3.54	5.86 $\pm$ 2.10	12.18 $\pm$ 4.62	13.68 $\pm$ 2.51	43.55 $\pm$ 9.15
	Radio and TV	13.01 $\pm$ 4.43	4.04 $\pm$ 3.40	10.68 $\pm$ 5.96	12.00 $\pm$ 3.83	39.73 $\pm$ 12.86
	Friends and acquaintances	13.52 $\pm$ 3.59	3.60 $\pm$ 3.20	9.78 $\pm$ 6.82	11.08 $\pm$ 4.39	38.00 $\pm$ 14.91
	Read books and newspapers	14.57 $\pm$ 3.20	2.71 $\pm$ 2.13	10.00 $\pm$ 4.35	13.00 $\pm$ 2.08	40.28 $\pm$ 7.71
<b>P-value</b>		0.000	0.000	0.023	0.001	0.038
Marital status	Married	12.79 $\pm$ 4.10	4.39 $\pm$ 3.05	11.29 $\pm$ 5.80	12.54 $\pm$ 3.63	41.02 $\pm$ 12.02
	Single	13.33 $\pm$ 2.05	5.71 $\pm$ 2.14	12.95 $\pm$ 4.36	14.19 $\pm$ 1.43	46.19 $\pm$ 7.13
<b>P-value</b>		0.554	0.054	0.202	0.040	0.054
Underlying disease	No	12.91 $\pm$ 3.84	3.35 $\pm$ 3.16	11.66 $\pm$ 6.09	12.34 $\pm$ 3.70	41.27 $\pm$ 12.62
	Yes	12.75 $\pm$ 4.15	4.64 $\pm$ 2.84	11.16 $\pm$ 5.3	13.00 $\pm$ 3.33	41.57 $\pm$ 10.90
<b>P-value</b>		0.737	0.414	0.471	0.121	0.833
Disease symptoms	No	12.80 $\pm$ 4.01	3.68 $\pm$ 2.88	10.31 $\pm$ 5.90	11.77 $\pm$ 3.60	38.57 $\pm$ 11.31
	Yes	12.85 $\pm$ 3.98	4.29 $\pm$ 2.99	12.01 $\pm$ 5.54	13.14 $\pm$ 3.42	42.93 $\pm$ 11.79
<b>P-value</b>		0.916	0.001	0.019	0.002	0.003
Mental illness	No	13.00 $\pm$ 2.89	4.23 $\pm$ 2.92	11.04 $\pm$ 5.81	12.32 $\pm$ 3.66	40.60 $\pm$ 11.30
	Yes	12.59 $\pm$ 4.13	4.89 $\pm$ 3.11	11.97 $\pm$ 5.55	13.17 $\pm$ 3.29	42.63 $\pm$ 12.54
<b>P-value</b>		0.409	0.073	0.189	0.052	0.163
Smoking	No	12.84 $\pm$ 4.06	4.38 $\pm$ 3.04	10.98 $\pm$ 5.86	12.46 $\pm$ 3.66	40.67 $\pm$ 12.09
	Yes	12.81 $\pm$ 3.61	5.09 $\pm$ 2.76	13.70 $\pm$ 4.28	13.72 $\pm$ 2.56	45.34 $\pm$ 9.25
<b>P-value</b>		0.973	0.1253	0.004	0.030	0.016

#### 4. DISCUSSION

The results of the present study indicate that, from the emotion-oriented coping styles, the domain of self-controlling received an unfavorable score, but in the problem-oriented coping styles, the two domains of seeking social support and positive reappraisal obtained a moderate to high and desirable score, respectively. The results of the present study were in line with the study of Agha-yousefi [17 - 19] in terms of seeking social support. Moreover, in Morowatisharifabad *et al.*, social support was emphasized as the most important source to reduce stress and depression [20]. In explaining these results, it is likely that this disease causes changes in physical condition, severe psychological issues, reduced duration of recreational activities and social communication, and therefore, having social support and positive reappraisal can be a great way to alleviate stress. The results of the present study showed that positive reappraisal had a high mean; that finding is similar to

the results of Faryabi and Ghaffari [17, 21]. Positive reappraisal increases the level of confrontation and can increase mental health [22], and as a self-regulatory source, can increase positive effects and reduce negative effects [23]. In terms of the domain of self-controlling, the results of the present study were inconsistent with the study of Golchin [18]. Indeed, it can be hypothesized that the presence of COVID-19, as compared to other previous studies, contributed to an ineffective control of emotions, hurried handling of events, and loss of focus on the situation and coping with the disease. In terms of the difference in the mean score of domains related to emotion-oriented coping style, we noted a significant difference between age and all domains ( $P < 0.05$ ).

There was also a statistically significant difference in emotion-oriented coping styles between the domains of self-controlling and escape-avoidance according to demographic variables. However, in the emotion-oriented coping style, there

was a statistically significant difference between the field of distancing according to literacy, source of information, disease symptoms, and smoking. The study by Fu *et al.*, showed that 29.8% of the participants in the study had a negative emotional response to COVID-19, and there was a statistically significant relationship between passive coping style in the face of COVID-19 and literacy [24]. The results of our study showed that underlying disease, smoking, and symptoms of the disease were associated with emotion-oriented coping styles, which was consistent with Alizadeh *et al.* [25]. Severe symptoms, such as body aches, fever, and lung involvement, appear to cause family and relatives to think about the disease and their condition; in both studies [24, 24], people with worse symptoms and underlying disease tend to deny and avoid the stressful situation [25].

When individuals imagine themselves exposed to an untreated situation and face illness and a long course of treatment; they are more likely to use an emotion-oriented strategy [21]. In Mohammadkhani [26], there was an inverse relationship between emotion-oriented style and students' general health. In the present study, the escape-avoidance domain was a notable variable for exposing the stress status of families and relatives against COVID-19. The results of Gerin *et al.* [27] also showed that, out of the eight domains of coping styles, only the escape-avoidance domain was a useful variable for predicting coronary heart disease. Avoidance coping style, which is a negative and emotional way of dealing with stressful life events, prevents the expression of feelings and emotions and facilitates emotional inhibition, and is a risk factor that predisposes a person to coronary heart disease [28]. Age, source of information, and literacy of individuals were identified as effective components in the problem-oriented style ( $P < 0.05$ ). The results of Ghazanfari *et al.*, showed that there was a significant relationship between mental health and coping strategies. Indeed, the more a person uses a problem-based coping strategy, the healthier they appear to be, and conversely, an emotion-oriented coping strategy increases physical symptoms, anxiety, social dysfunction, and depression [29]. However, in our study, the presence or absence of disease had no effect on the use of coping styles. Therefore, improving people's literacy and paying attention to the source of information, such as using social networks and supporting family, friends, and health workers, can help people deal with the problem and reduce stress in people. In our study, there was no apparent relationship between age, gender, and marital status and coping strategies, whilst in the study by Nguyen *et al.* [30], age, gender, social class, and personality traits were influential factors in coping strategies. The use of checklists and different populations in the two studies may be a cause of discrepancy. In the present study, literacy was identified as an influential variable in the use of problem-oriented coping strategies, but in Nguyen *et al.* [30], social class was associated with coping strategies. Typically, people with higher education are in a higher social class, and therefore, in stressful situations, they tend to use more problem-solving coping strategies. In the problem-oriented coping strategy, planful problem solving and positive reappraisal was more commonly used. In Wu *et al.* [31], in concordance with our findings, the authors showed that the use of a problem-solving coping

strategy is an important factor in the association between anxiety and depressive symptoms and the change in substance use. So, people who are more resilient tend to employ problem-oriented coping strategies and use problem-solving skills, counseling, and goal-setting skills in difficult situations, such as severe symptoms of disease and smoking.

Due to the severe global situation, COVID-19 posed a great threat to families and was viewed as uncontrollable in the early period of the disease, causing people to suppress their emotions and follow an emotion-oriented coping approach. By suppressing emotions, the destructive effect on people increases [32]. Indeed, in Reeve *et al.* [33], the use of two strategies of problem solving and focus on emotion was identified as effective guides against stress. In Alexander and Harrison [34], low effect and ineffective strategies, such as distancing were mentioned as vulnerable factors against stress, whilst in Sudraba [35], addicts used the emotion-oriented coping strategy more, but in our study, smoking in family and friends was associated with both strategies. Different populations and the presence of COVID-19 can affect the choice of strategy in individuals. Indeed, emotion-oriented coping focuses on controlling emotional distress and focuses on the emotional factors associated with it, not the situation itself. Instead of coping, these individuals tend to experience problems. Negative life events, perceived stress, more use of negative coping techniques, anger, and helplessness, and less use of positive coping techniques and cognitive coping are significantly and independently associated with smoking and drug use [36].

In terms of coping style or type of adaptation, smoking has been recognized as an important factor that may be associated with both types of coping styles. In Gan *et al.*, a passive-maladaptive pattern prevailed when dealing with stressful events in daily life [37]. In addition, study participants who showed less differential ability to control situations related to stressful events in daily life showed a weaker strategy for coping with SARS-related events than stressful events in daily life [37]. This could be the case with COVID-19 due to the prevalence of false beliefs and rumors on social media and in society about the protective effect of alternative therapies, *e.g.*, opium use [38].

The use of both types of coping styles depends on the level of social support in addicts. Indeed, the usefulness of social support may affect the subjective assessment of stressors, the choice of effective coping strategies, self-esteem, and individual skills. Previous studies have shown that people with high social support are more resilient in the face of stressful life events and use better coping methods [39]. In other words, inefficient coping of family and relatives with stressors in the long run has negative consequences, such as depression, anxiety, and drug use. Conversely, people who choose a more appropriate coping style are more likely to have broader social support and better mental health, and, as a result, are less likely to be exposed to drugs and have problem-solving skills in stressful situations.

## 5. LIMITATIONS

Although we present a novel addition to the literature,

there are numerous limitations of the present study that should be considered 1: Patients' families did not cooperate fully in completing the questionnaires due to stress and anxiety about the disease. 2: Questionnaires were completed virtually; a number of people did not have electronic devices or facilities, and also had not been taught how to work with it. 3: The present study was conducted in southern Iran only, which harms its' national and international generalizability.

## CONCLUSION

In the present study, the escape- avoidance coping style, planful problem solving, and positive reappraisal were useful variables for the prediction of the stress status of families and relatives.

Therefore, given the importance of the Lazarus and Folkman model, it is recommended that providing structured education to families and others, can markedly reduce stress. Moreover, by using coping techniques, this confidence and resilience increased in families, providing very favorable and calm conditions for the care of COVID-19 patients. Therefore, in addition to medical and psychological interventions for patients with COVID-19, psychological interventions for those around them and their caregivers, such as teaching coping strategies, seems necessary.

## AUTHORS' CONTRIBUTIONS

Conceptualization was done by R.F and E.M. Data curation was done by S.D and T.R. Formal analysis was conducted by A.Y. Investigation was done by MSH.K. Methodology was selected by D.C and S.A. Project administration was done by A R.F and E.M. Writing the original draft was done by E.M and R.F, and review & editing were done by A.Y and MSH.K. All authors have read and agreed to the published version of the manuscript.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This project acquired an ethical Committee approval from the Jiroft University of Medical Science (IR.JMU.REC.1399.003).

## HUMAN AND ANIMAL RIGHTS

No animals were used for studies that are the basis of this research. All the humans were used in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013 (<http://ethics.iit.edu/ecodes/node/3931>).

## CONSENT FOR PUBLICATION

Informed written and verbal consents were taken from all participants prior to data collection.

## STANDARDS OF REPORTING

STROBE guidelines were followed.

## AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available from corresponding author [E.M] upon reasonable request.

## FUNDING

None.

## CONFLICT OF INTEREST

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

## ACKNOWLEDGEMENTS

We would like to acknowledge families and relatives of COVID-19 patients who helped the researchers in the data collection.

## REFERENCES

- [1] Huang L. rong Liu H: Emotional responses and coping strategies of nurses and nursing college students during COVID-19 outbreak. MedRxiv 2020. Preprint [<http://dx.doi.org/10.1101/2020.03.05.20031898>]
- [2] Wang C, Pan R, Wan X, *et al.* Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health* 2020; 17(5): 1729. [<http://dx.doi.org/10.3390/ijerph17051729>] [PMID: 32155789]
- [3] Alizadeh S, Morrowati Sharifabad MA, Ghaffari M, Mehrabi Y, Askari J, Zare S. Effectiveness of interventions based on lazarus and folkman transactional model on improving stress appraisal for hemodialysis patients in Tehran. *Saudi J Kidney Dis Transpl* 2020; 31(1): 150-9. [<http://dx.doi.org/10.4103/1319-2442.279935>] [PMID: 32129208]
- [4] Brooks SK, Webster RK, Smith LE, *et al.* The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *Lancet* 2020; 395(10227): 912-20. [[http://dx.doi.org/10.1016/S0140-6736\(20\)30460-8](http://dx.doi.org/10.1016/S0140-6736(20)30460-8)] [PMID: 32112714]
- [5] Sun L, Sun Z, Wu L, *et al.* Prevalence and risk factors of acute posttraumatic stress symptoms during the COVID-19 outbreak in Wuhan, China. MedRxiv 2020. Preprint
- [6] Cowling BJ, Ng DMW, Ip DKM, *et al.* Community psychological and behavioral responses through the first wave of the 2009 influenza A(H1N1) pandemic in Hong Kong. *J Infect Dis* 2010; 202(6): 867-76. [<http://dx.doi.org/10.1086/655811>] [PMID: 20677945]
- [7] Trougakos JP, Chawla N, McCarthy JM. Working in a pandemic: Exploring the impact of COVID-19 health anxiety on work, family, and health outcomes. *J Appl Psychol* 2020; 105(11): 1234-45. [<http://dx.doi.org/10.1037/apl0000739>]
- [8] Goh YW, Sawang S, Oei TPS. The Revised Transactional Model (RTM) of occupational stress and coping: An improved process approach. *Aust N Z J Organ Psychol* 2010; 3: 13-20. [<http://dx.doi.org/10.1375/ajop.3.1.13>]
- [9] Thiel CE, Connelly S, Griffith JA. The influence of anger on ethical decision making: Comparison of a primary and secondary appraisal. *Ethics Behav* 2011; 21(5): 380-403. [<http://dx.doi.org/10.1080/10508422.2011.604295>]
- [10] Morowatisharifabad MA, Ghaffari M, Mehrabi Y, Askari J, Zare S, Alizadeh S. Experiences of stress appraisal in hemodialysis patients: A theory-guided qualitative content analysis. *Saudi J Kidney Dis Transpl* 2020; 31(6): 1294-302. [<http://dx.doi.org/10.4103/1319-2442.308338>]
- [11] Anderson EM, Larkins S, Beaney S, Ray RA. Coping with ageing in rural Australia. *Aust J Rural Health* 2020; 28(5): 469-79. [<http://dx.doi.org/10.1111/ajr.12647>] [PMID: 32989901]
- [12] Ma J, Liu C, Peng Y, Xu X. How do employees appraise challenge and hindrance stressors? Uncovering the double-edged effect of conscientiousness. *J Occup Health Psychol* 2021; 26(3): 243-57. [<http://dx.doi.org/10.1037/ocp0000275>] [PMID: 33764082]
- [13] Crowe BM, Van Puymbroeck M. Enhancing problem- and emotion-focused coping in menopausal women through yoga. *Int J Yoga*

- Therap 2019; 29(1): 57-64.  
[http://dx.doi.org/10.17761/2019-00020] [PMID: 30789778]
- [14] Alipour A, Hashemi T, Babapour J, Toosi F. The relationship between coping strategies and students' happiness. *J Psychol Univ Tabriz* 2010; 5(18): 20-9.
- [15] Folkman S, Lazarus RS, Gruen RJ, DeLongis A. Appraisal, coping, health status, and psychological symptoms. *J Pers Soc Psychol* 1986; 50(3): 571-9.  
[http://dx.doi.org/10.1037/0022-3514.50.3.571] [PMID: 3701593]
- [16] Aghayosefi A CF, Shaghghi F, Motiai G. Effectiveness of teaching techniques of coping in coping strategies of infertility Womens. *behbood J* 2012; 16(2): 455-64.
- [17] Faryabi R, Mirzaee R, Salari E, Javadi A. Investigating the effect of education based on original article lazarus and folkman's transactional stress model on coping skills of Jieroft university of medical sciences health care workers. *J Jiroft Uni Med Sci* 2016; 2(2): 152-62.
- [18] Golchin NJJoFoMH. The efficacy of cognitive behavioral therapy on using coping strategies and decreasing pain among females with chronic back pain. *J Fund Mental Health* 2011; 13(50): 9-160.  
[http://dx.doi.org/10.22038/JFMH.2011.1016]
- [19] Agha-Yousefi A, Choubsaz F, Shaghghi F, Motiei G. The effect of coping techniques training on coping strategies of infertile women in Kermanshah. *J Kermanshah Univ Med Sci* 2012; 16(2): 155-64.
- [20] Morowatisharifabad MA, Movahed E, Farokhzadian J, Nikooie R, Askarishahi M, Bidaki R. promotion h: Antiretroviral therapy adherence based on information, motivation, and behavioral skills model and its association with depression among HIV-positive patients: Health promotion strategy towards the 909090 target. *J Edu Health Prom* 2019; 8: 192.
- [21] Ghaffari M, Morowatisharifabad MA, Mehrabi Y, Zare S, Askari J, Alizadeh S. What are the hemodialysis patients' style in coping with stress? a directed content analysis. *Int J Community Based Nurs Midwifery* 2019; 7(4): 309-18.  
[http://dx.doi.org/10.30476/IJCBNM.2019.81324.0] [PMID: 31641680]
- [22] A survey of relationship between coping styles and mental health in patients undergoing hemodialytic treatment. *J Fund Mental Health* 2008; 10(38): 117-22.  
[http://dx.doi.org/10.22038/JFMH.2008.1765]
- [23] Pogrebtsova E, Craig J, Chris A, O'Shea D, González-Morales MG. Exploring daily affective changes in university students with a mindful positive reappraisal intervention: A daily diary randomized controlled trial. *Stress Health* 2018; 34(1): 46-58.  
[http://dx.doi.org/10.1002/smi.2759] [PMID: 28512859]
- [24] Fu W, Wang C, Zou L, *et al.* Psychological health, sleep quality, and coping styles to stress facing the COVID-19 in Wuhan, China. *Transl Psychiatry* 2020; 10(1): 225.  
[http://dx.doi.org/10.1038/s41398-020-00913-3] [PMID: 32066695]
- [25] Alizadeh S, Morrowati Sharifabad MA, Ghaffari M, Mehrabi Y, Askari J, Zare S. Effectiveness of interventions based on lazarus and folkman transactional model on improving stress appraisal for hemodialysis patients in Tehran. *Saudi J Kidney Dis Transpl* 2020; 31(1): 150-9.  
[http://dx.doi.org/10.4103/1319-2442.279935] [PMID: 32129208]
- [26] Mohammadkhani S, Bashgharah R. Emotional intelligence and coping styles as predictors of general health. *Res psychol health* 2008; 37-47.
- [27] Gerin W, Pieper C, Marchese L, Pickering TG. The multi-dimensional nature of active coping: differential effects of effort and enhanced control on cardiovascular reactivity. *Psychosom Med* 1992; 54(6): 707-19.  
[http://dx.doi.org/10.1097/00006842-199211000-00011] [PMID: 1454965]
- [28] Omran MTS, Sadeghpour M, Yaghoubi AA, Shamsi R. A Comparison of Coping Styles and Quality of Life in Patients with Coronary Heart Disease and Healthy People. *J Babol Univ Med Sci* 2017; 19(3): 7-14.  
[http://dx.doi.org/10.22088/jbums.19.3.7]
- [29] Ghazanfari F. The relationship between mental health and coping strategies in citizenship of Khoramabad city. *J Fund Mental Health* 2008; 10(37): 47-54.  
[http://dx.doi.org/10.22038/JFMH.2008.1775]
- [30] Nguyen LK, Spitzberg BH, Lee CMJV. victims: Coping with obsessive relational intrusion and stalking: The role of social support and coping strategies 2012; 27(3): 414-33.  
[http://dx.doi.org/10.22038/JFMH.2008.1775]
- [31] Wu Q, Slesnick N, Zhang J. Understanding the role of emotion-oriented coping in women's motivation for change. *J Subst Abuse Treat* 2018; 86: 1-8.  
[http://dx.doi.org/10.1016/j.jsat.2017.12.006] [PMID: 29415845]
- [32] Trougakos JP, Chawla N, McCarthy JM. Working in a pandemic: Exploring the impact of COVID-19 health anxiety on work, family, and health outcomes. *J Appl Psychol* 2020; 105(11): 1234-45.  
[http://dx.doi.org/10.1037/apl0000739] [PMID: 32969707]
- [33] Reeve KL, Shumaker CJ, Yearwood EL, Crowell NA, Riley JB. Perceived stress and social support in undergraduate nursing students' educational experiences. *Nurse Educ Today* 2013; 33(4): 419-24.  
[http://dx.doi.org/10.1016/j.nedt.2012.11.009] [PMID: 23246284]
- [34] Alexander SJ, Harrison AG. Cognitive responses to stress, depression, and anxiety and their relationship to ADHD symptoms in first year psychology students. *J Atten Disord* 2013; 17(1): 29-37.  
[http://dx.doi.org/10.1177/1087054711413071] [PMID: 21825110]
- [35] Sudraba V, Millere A, Deklava L, *et al.* Stress coping strategies of drug and alcohol addicted patients in latvia. *Procedia Soc Behav Sci* 2015; 205: 632-6.  
[http://dx.doi.org/10.1016/j.sbspro.2015.09.099]
- [36] Siqueira L, Diab M, Bodian C. Adolescents becoming smokers: The roles of stress and coping methods. *J Adol Health* 2004; 27(6): 399-408.  
[http://dx.doi.org/10.1016/S1054-139X(00)00167-1]
- [37] Gan Y, Liu Y, Zhang Y. Flexible coping responses to severe acute respiratory syndrome-related and daily life stressful events. *Asian Journal of Social Psychology* 2004; 7(1): 55-66.  
[http://dx.doi.org/10.5812/ijpbs.103509]
- [38] Saeedi M, Omrani-Nava V, Maleki I, *et al.* Opium addiction and COVID-19: Truth or false beliefs. *Iran J Psychiatry Behav Sci* 2020; 14(2): e103509.  
[http://dx.doi.org/10.5812/ijpbs.103509]
- [39] Monroe SM, Bromet EJ, Connell MM, Steiner SC. Social support, life events, and depressive symptoms: A 1-year prospective study. *J Consult Clin Psychol* 1986; 54(4): 424-31.  
[http://dx.doi.org/10.1037/0022-006X.54.4.424] [PMID: 3745594]