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The Relationship between Life Hope Approach, Agency and Pathway Thinking with psychological Self-Care in Patients with COVID-19

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ABSTRACT

Background and Objective: Hope is essential in all aspects of life; it can enrich life and improve patients' recovery. The present study was conducted to determine the relationship between Life Hope Approach, Agency and Pathway Thinking with psychological Self-Care in Patients with COVID-19.

Methods: This descriptive cross-sectional study was conducted on 250 patients with COVID-19 hospitalized in the wards of Shahid Yahya Nejad and Ayatollah Rouhani hospitals in Babol from 2022 to 2023. Demography, psychological self-care, and Snyder Hope Scale questionnaires were provided to the patients to be filled out.

Findings: The mean score of hope was 37.8±9.6 and the mean scores of the subcomponents of agency thinking and pathway thinking were 18.6±5.6 and 19.1±4.9, respectively. The results of the linear regression model indicated the predictive role of the hope variable and its subcomponents on self-care in patients with COVID-19 (p=0.0001). After adjusting for other variables, the total hope score predicted self-care (p=0.0001), communication effectiveness (p=0.002), coping with problems (p=0.004), and physical self-care (p=0.0001). Regarding the demographic variables, age predicted self-care (p=0.028), self-awareness (p=0.028), and personal and religious activities (p=0.003). The gender variable was able to positively predict the maintenance and development of a support system (p=0.009) and negatively predict physical self-care (p=0.022). The education variable (p=0.001) was also able to positively predict individual religious activities. In addition, place of residence was a predictor of self-care performance (p=0.010), self-awareness (p=0.040), communication effectiveness (p=0.008), time effectiveness (p=0.008), and individual and religious activities (p=0.046). Length of hospital stay was only a predictor of the subcomponent of awareness (p=0.044).

Conclusion: The results of the study showed that there was a significant positive relationship between hope approach and subcomponents of agency thinking and pathway thinking with psychological self-care.

Keywords: *COVID-19, Patient, Self-Care, Psychological, Hope.*

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Introduction

Self-care is considered a new trend in health care and is now recognized as one of the subjects raised in various fields of medicine, sociology, and psychology (1). The word "care" is derived from the Latin word Cura, meaning to express concern and care (2). Self-care includes conscious and purposeful activities that are carried out by an individual to preserve life, and to improve the health of oneself and one's family (3). An important principle in self-care is participation and acceptance of responsibility on the part of the individual to prevent illness and injuries by performing health-oriented behaviors correctly (4). According to the obtained evidence, increasing self-care improves health and leads to satisfaction of individuals and families, increased quality of life, fewer outpatient visits, and reduced health costs (5). Studies have shown that self-care effectively reduces complications caused by illness. Therefore, patients should be helped to learn the skills to manage their own care program. In this regard, healthcare providers should pay attention to psychological changes in these patients, ensure continuity of care, provide professional support from the hospital to home, and increase patients' trust so that they can return to their family and community (6).

Various studies have shown that patients with COVID-19 had limited information about their condition, diagnosis, treatment, and recovery. Some people were worried about their illness, fearing that they would not receive timely medical help and that the disease would worsen, leading to complications or even death (7). Due to uncertainty about the disease (concern about prognosis and possibility of death) and physical symptoms of the disease, infected individuals experienced fear, worry, anxiety, depression, as well as negative emotions such as loneliness, guilt, and pain (8). Therefore, understanding the disease process and the psychological experience of patients, providing timely treatment, guidance, and effective psychological interventions for them is essential (7), and it seems necessary for medical personnel to convey knowledge of the disease to patients by explaining preventive measures, self-care, treatments, and medications (9).

According to the World Health Organization, preventive measures are the only non-pharmacological way to combat the COVID-19 epidemic. The management and treatment of COVID-19 is largely related to self-care, and patients with COVID-19 play a key role in their own treatment. In other words, this disease requires the patient's participation and commitment in self-care due to its long duration (10).

Studies have shown that several psychological roles, such as creating hope and intimacy with others, help individuals understand and cope with life-threatening events (11). Hope is a cognitive set that is based on a sense of success arising from various sources and goal-oriented decisions (agency thinking) and chosen paths or methods (pathway thinking) to achieve goals. Agency thinking includes the thoughts that individuals have defined about their abilities to traverse the chosen paths to achieve their goals. Pathway thinking also reflects the capacity of an individual to generate cognitive channels to achieve their goals. If either of these two cognitive elements is absent, achieving goals is impossible (12). The hope construct is not a passive emotion that appears only in dark moments of life, but rather a cognitive process through which individuals actively pursue their goals (13).

The results of a study by Islam et al. showed a decrease in hope in men and women during the COVID-19 pandemic (14). There is also a positive relationship between high levels of hope and better physical and mental health and the effectiveness of psychotherapy methods used in treatment (15). In recent years, psychologists have pointed to the hope construct as a psychological strength and believe that this construct can greatly contribute to the creation and development of health (14). The results of one study showed that hopelessness can be associated with reduced self-care and increased depression in patients with chronic illness (16). In other words, hopelessness pathways associated with illness increase negative emotions in

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the individual and can lead to reduced self-care and change in the state of the illness (17). In another study, it was shown that hopefulness helps patients formulate goals and create multiple pathways to achieve them, and reframe obstacles as challenges to overcome (18). By reducing negative metacognitive beliefs, hope gives the patient the awareness that he or she is able to control negative emotions resulting from the illness and can establish his or her therapeutic goals to increase self-care through hope pathways (17).

Given the high prevalence of COVID-19 and the importance of promoting and developing self-care programs for patients with COVID-19 to prevent early and late complications, and since hope approach can focus on the capabilities of patients and put the individual on the right path to health, the present study was conducted to determine the relationship between Life Hope Approach, Agency and Pathway Thinking with psychological Self-Care in Patients with COVID-19.

Methods

After approval by the Ethics Committee of Babol University of Medical Sciences with the code IR.MUBABOL.REC.1401.063, this cross-sectional study was conducted on patients with COVID-19 with a positive polymerase chain reaction (PCR) test hospitalized in the infectious, pulmonary, and internal medicine departments of Ayatollah Rouhani and Shahid Yahya Nejad Hospital in Babol in 2022-2023. Before participation, an informed consent was obtained from patients and confidentiality of information was taken into account. Patients were included if they were over 18 and under 70 years, hospitalized for at least 24 hours, were in a stable general condition to complete the questionnaire, did not suffer from severe physical or mental disorders, had at least a fifth-grade education, and consented to participate in the study. Participants were excluded if they were not willing to cooperate with the researcher, did not fully complete the questionnaire, or experienced any unpleasant events. Of the 286 patients with COVID-19 disease with a positive PCR test, 36 were not eligible for the study and were excluded, and therefore the study was conducted on 250 patients.

The sample size was calculated as 250 people at a 95% confidence interval, considering the estimated correlation of 0.2 between hope and self-care, 80% power, and 20% possible dropout according to the formula. To collect data, the following questionnaires were provided to patients with COVID-19 in different departments to complete:

Demographic characteristics questionnaire: This questionnaire included age, gender, education, occupation, place of residence, departments, and length of hospital stay.

Snyder Hope Scale (SHS): This scale was developed by Snyder et al. (13) to determine hope. It has 12 items with an 8-point Likert scale ranging from completely false (score 1) to completely true (score 8), with 4 items measuring the subscale of agency thinking and 4 items measuring the subscale of pathway thinking, and the other 4 items were deviating (19). The range of the total score was 8-64 and 4-32 for each of the subscales. The Cronbach's alpha coefficient for the Snyder Hope Scale was 0.86 and its subscales included motivational thinking 0.77 and pathway thinking 0.79 (20).

Psychological Self-Care Questionnaire: This is a 46-item questionnaire designed to collect data on self-care behaviors, which was developed by Yunibhand in 1991. The questionnaire has 7 subcomponents: self-awareness, communication effectiveness, coping with problems, maintaining and developing a support system, time effectiveness, religious activities, and physical self-care with a four-point Likert scale of 1 (rarely or never), 2 (sometimes), 3 (often), and 4 (always). The total score range is 46-184. (21). The validity and reliability of the Persian version of this questionnaire was conducted by Mirtabar et al. The content validity ratio (CVR) was 0.82 and the content validity index (CVI) was 0.85. Confirmatory factor analysis of the questionnaire was conducted using Amos 21 software, which indicated a good fit of the

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measurement model. The Cronbach's alpha coefficient for the 46-item Persian version of the questionnaire was 0.70. The validity of its subcomponents with Cronbach's alpha has been reported to range from 0.82 to 0.90 (22, 23).

Finally, data were analyzed using SPSS version 24. Quantitative variables were expressed as mean and standard deviation, and qualitative variables were expressed as frequency and percentage. Pearson's correlation coefficient test was used to examine the correlation between variables, whereas simple linear regression and multiple linear regression were used to determine the predictive factors, and $p<0.05$ was considered significant.

Results

More than half of the patients were female (56%) and the rest were male (44%). The mean age of female patients was 49.54±12.66 years and that of male patients was 49.54±12.66 years. The majority of women (72.1%) and men (78.2%) had a high school diploma or lower education. The highest percentage of women were housewives (70.7%), and men were self-employed (61.8%). 41.4% of women and 34.5% of men were hospitalized in the infectious disease department. The length of hospital stay in the majority of cases was 5 days or more, 90.7% in women and 88.2% in men (Table 1).

The mean score of hope was 37.8±9.6 and the mean scores of the subcomponents of agency thinking and pathway thinking were 18.6±5.6 and 19.1±4.9, respectively. This score was 39.2±10.5, 19.4±9.5, 19.8±5.5 in women and 36.2±8.4, 17.7±2.5, 18.5±4.1 in men, respectively. The mean score of self-care was 115.4±9.15. This score was 115.6±15.7 in women and 115.2±16.3 in men, respectively. The highest mean value of self-care components was related to communication effectiveness and the lowest was time effectiveness (Figure 1).

Table 1. Demographic characteristics of patients with COVID-19 hospitalized in Yahya Nejad and Rouhani hospitals according to gender (n=250)

Variable	Female (n=140) Mean±SD or number(%)	Male (n=110) Mean±SD or number(%)
Age (years)	49.54±12.66	49.74±12.70
Level of education		
Diploma or lower	101(72.1)	86(78.2)
Academic	39(27.9)	24(21.8)
Occupation		
Housewife	99(70.7)	5(4.5)
Employee	10(7.1)	14(12.7)
Self-employed	6(4.3)	68(61.8)
Unemployed	8(5.7)	13(11.8)
Other	17(12.1)	10(9.1)
Inpatient departments		
Lung	32(22.9)	26(23.6)
Infectious	58(41.4)	38(34.5)
Internal medicine	24(17.1)	18(16.4)
Other	26(18.6)	28(25.5)
Length of stay		
Less than 5 days	13(9.3)	13(11.8)
5 days and more	127(90.7)	97(88.2)

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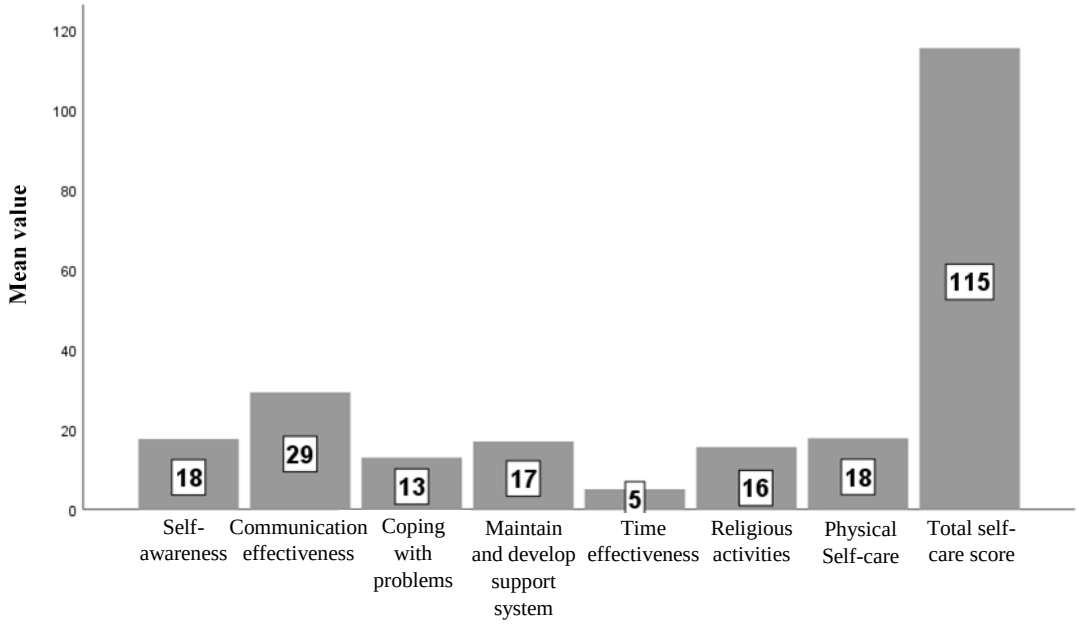

Figure 1. Mean score of the self-care questionnaire and its components in patients with COVID-19

There was a significant positive association between hope and subcomponent of agency thinking with self-care [(p=0.0001, r=0.220) and (p=0.0001, r=0.251)], communication effectiveness [(p=0.012, r=0.159) and (p=0.002, r=0.196)], coping with problems [(p=0.001, r=0.208) and (p=0.004, r=0.183)], and physical self-care [(p=0.001, r=0.209) and (p=0.0001, r=0.253)], respectively. There was a significant positive association between subcomponent of pathway thinking and self-care (p=0.0001, r=0.240), communication effectiveness (p=0.001, r=0.200), and physical self-care (p=0.0001, r=0.222). The data indicated a significant positive association between self-care and all of its subcomponents (p=0.0001). The highest association of self-care with its subcomponents was related to communication effectiveness (p=0.0001, r=0.698). There was also a significant positive association between hope and all of its subcomponents (p=0.0001). The highest association of hope with its subcomponents was related to agency thinking (p=0.0001, r=0.924) (Table 2).

The results of the linear regression model of hope and self-care in patients with COVID-19 indicated a positive predictive role of the hope variable on self-care (β=0.251, p=0.00001). For every one-unit increase in hope, the self-care performance of patients with COVID-19 increased by 0.251 units. With the increase in the hope construct, self-care increased in infected patients. The hope construct was able to explain 6.3% of the variance changes in self-care.

The findings indicated that the subcomponents of hope were also positive predictors of self-care. With the increase in the use of agency thinking (β=0.220, p=0.00001) and pathway thinking (β=0.240, p=0.00001), the improvement in self-care performance was greater in patients. These components were able to explain 4.8% and 5.8% of self-care performance, respectively. There was a significant positive association between the hope variable (β=0.196, p=0.002) and its subcomponents including agency thinking (β=0.159, p=0.012) and pathway thinking (β=0.290, p=0.001) with the variable of communication effectiveness. In other words, increasing hope and its subcomponents led to the improvement of effective communication in patients. These components were able to explain 3.8%, 2.5%, and 4% of self-care performance, respectively. The findings showed that the hope variable (β=0.183, p=0.004) and its agency thinking (β=0.208, p=0.001) led to better coping with problems in patients with COVID-19. 3.3% and 4.3%

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of the variance changes in coping with problems were explained by the hope construct and pathway thinking construct, respectively. Also, hope (β=0.235, p=0.0001) and its components including agency thinking (β=0.209, p=0.001) and pathway thinking (β=0.222, p=0.0001) had a significant positive association with physical self-care performance and could explain 5.5%, 4.4%, and 4.9% of the variance in physical self-care, respectively (Table 3).

Multiple linear regression was used to evaluate the association between the variables of age, gender, education, place of residence, length of stay, and total hope score on self-care and its components. Based on the results of multiple linear regression, after adjusting for other variables, total hope score (β=0.366, p=0.0001), age (β=0.181, p=0.028), and place of residence (β=5.283, p=0.010) were significant positive predictors of self-care performance and overall, they were able to explain 11.9% of the variance in self-care performance. The variables of gender, education, and length of stay could not be predictors of self-care (Table 4).

Table 2. Pearson correlation matrix for the association between hope and self-care in patients with COVID-19 (n=250)

Variable	1	2	3	4	5	6	7	8	9	10	11
Hope	1										
Pathway thinking	0.898** 0.0001	1									
Agency thinking	0.924** 0.0001	0.662** 0.0001	1								
Self-care	0.251** 0.0001	0.240** 0.0001	0.220** 0.0001	1							
Self-awareness	0.090 0.157	0.111 0.080	0.057 0.372	0.467** 0.0001	1						
Communication effectiveness	0.196** 0.002	0.200** 0.001	0.159** 0.012	0.698** 0.0001	0.510** 0.0001	1					
Coping with problems	0.183** 0.004	0.119 0.060	0.208** 0.001	0.484** 0.0001	-0.098 0.123	0.232** 0.0001	1				
Maintaining and developing a support system	0.073 0.249	0.065 0.307	0.068 0.281	0.422** 0.0001	0.178** 0.005	-0.078 0.220	0.317** 0.0001	1			
Time effectiveness	0.071 0.265	0.057 0.367	0.071 0.265	0.435** 0.0001	0.180** 0.004	0.360** 0.0001	0.365** 0.0001	-0.053 0.402	1		
Religious activity	0.029 0.652	0.038 0.552	0.016 0.800	0.591** 0.0001	0.011 0.862	0.144** 0.023	0.107 0.092	0.394** 0.0001	0.125** 0.048	1	
Physical self-care	0.235** 0.0001	0.222** 0.0001	0.209** 0.001	0.365** 0.0001	0.122 0.055	0.018 0.772	0.033 0.608	-0.015 0.815	0.068 0.282	0.174** 0.006	1

**Correlation is significant at the 0.05 level (two ranges)

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Table 3. Results of the linear regression model of hope and self-care and its dimensions in patients with COVID-19 (n=250)

Model	Dependent variable	Independent variable	Non-standard beta	Standard deviation	Standard beta	R^2	p-value	95% CI	
								Min	Max
1	Self-care	Hope	0.413	0.101	0.251	0.063	0.0001	0.214	0.613
2	Self-care	Agency thinking	0.616	0.174	0.220	0.048	0.0001	0.273	0.958
3	Self-care	Pathway thinking	0.775	0.199	0.240	0.058	0.0001	0.383	1.168
4	Self-awareness	Hope	0.039	0.028	0.090	0.008	0.157	-0.015	0.093
5	Self-awareness	Agency thinking	0.042	0.047	0.057	0.003	0.372	-0.051	0.135
6	Self-awareness	Pathway thinking	0.095	0.054	0.111	0.012	0.080	-0.011	0.201
7	Communication effectiveness	Hope	0.144	0.046	0.196	0.038	0.002	0.054	0.234
8	Communication effectiveness	Agency thinking	0.200	0.079	0.159	0.025	0.012	0.045	0.355
9	Communication effectiveness	Pathway thinking	0.200	0.090	0.290	0.040	0.001	0.112	0.467
10	Coping with problems	Hope	0.068	0.023	0.183	0.033	0.004	0.022	0.114
11	Coping with problems	Agency thinking	0.132	0.039	0.208	0.043	0.001	0.054	0.209
12	Coping with problems	Pathway thinking	0.087	0.046	0.119	0.014	0.060	-0.004	0.177
13	Maintaining and developing a support system	Hope	0.038	0.033	0.073	0.005	0.249	-0.027	0.103
14	Maintaining and developing a support system	Agency thinking	0.061	0.056	0.068	0.005	0.281	-0.050	0.171
15	Maintaining and developing a support system	Pathway thinking	0.066	0.065	0.065	0.004	0.307	-0.061	0.194
16	Time effectiveness	Hope	0.012	0.011	0.071	0.005	0.265	-0.009	0.033
17	Time effectiveness	Agency thinking	0.021	0.018	0.071	0.005	0.265	-0.016	0.057
18	Time effectiveness	Pathway thinking	0.019	0.021	0.057	0.003	0.367	-0.023	0.061
19	Religious activity	Hope	0.015	0.033	0.029	0.001	0.652	-0.050	0.080
20	Religious activity	Agency thinking	0.014	0.057	0.016	0.0001	0.800	-0.097	0.126

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21	Religious activity	Pathway thinking	0.039	0.065	0.038	0.001	0.552	-0.090	0.167
22	Physical self-care	Hope	0.097	0.025	0.235	0.055	0.0001	0.047	0.147
23	Physical self-care	Agency thinking	0.146	0.044	0.209	0.044	0.001	0.061	0.232
24	Physical self-care	Pathway thinking	0.180	0.050	0.222	0.049	0.0001	0.081	0.278

Table 4. Results of the multiple linear regression model of hope and background variables in association with self-care and its components in patients with COVID-19 (n=250)

Variable	Self-care and its subcomponents							
	Self-care	**Self-awareness**	**Commination effectiveness**	**Coping with problems**	**Maintaining and developing a support system**	**Time effectiveness**	**Religious activity**	**Physical self-care**
Total hope score								
p-value	0.0001	0.266	0.002	0.004	0.429	0.616	0.826	0.0001
Non-standard beta	0.223	0.070	0.192	0.186	0.050	0.032	-0.014	0.245
Standard beta	0.366	0.031	0.142	0.069	0.026	0.006	-0.007	0.101
Age								
p-value	0.028	0.028	0.063	0.845	0.267	0.073	0.003	0.969
Non-standard beta	0.144	0.147	0.121	-0.013	-0.074	0.121	0.202	0.003
Standard beta	0.181	0.049	0.068	-0.004	-0.030	0.016	0.081	0.001
Gender								
p-value	0.918	0.974	0.175	0.511	0.009	0.141	0.174	0.022
Non-standard beta	0.006	-0.002	-0.085	-0.043	0.170	0.096	0.087	-0.147
Standard beta	0.207	-0.018	-1.220	-0.312	1.726	0.320	0.890	-1.181
Education								
p-value	0.118	0.571	0.100	0.848	0.098	0.857	0.001	0.064
Non-standard beta	0.098	0.036	-0.102	0.012	0.106	0.012	0.210	0.118
Standard beta	3.576	0.350	-1.677	0.103	1.228	0.044	2.448	1.080
Residence								
p-value	0.010	0.040	0.008	0.736	0.291	0.008	0.046	0.474
Non-standard beta	0.165	0.134	0.169	0.022	-0.069	0.176	0.130	0.046
Standard beta	5.283	1.130	2.417	0.161	-0.696	0.584	1.318	0.370
Length of hospital stay								
p-value	0.678	0.044	0.573	0.205	0.187	0.518	0.162	0.964
Non-standard beta	0.026	0.131	0.036	-0.084	0.086	-0.043	-0.091	0.003
Standard beta	1.379	1.811	0.833	-0.988	1.421	-0.231	-1.505	0.038
R^2	0.119	0.082	0.126	0.044	0.072	0.053	0.083	0.092

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The results indicated that the variables of age (β=0.049, p=0.028), place of residence (β=1.130, p=0.040), and length of hospital stay (β=1.811, p=0.044) were able to positively predict self-awareness after adjusting for other variables. These variables were able to explain 8.2% of the variance in self-awareness of patients with COVID-19 (Table 4).

The findings showed that total hope score (β=0.142, p=0.002) and place of residence (β=2.417, p=0.008) were able to positively predict communication effectiveness. The effect of the above components on communication in patients with COVID-19 after adjusting for other variables was 12.6% (Table 4). The results also showed that the total hope score was able to positively predict coping with problems (β=0.069, p=0.004) and, after adjusting for other variables, it was able to explain 4.4% of the variance in coping with problems in patients with COVID-19 (Table 4).

The data showed that the gender variable was able to significantly predict the maintenance and development of the support system (β=1.726, p=0.009). In other words, women were more likely to maintain and develop a support system. The effect of the gender component on the maintenance and development of the support system of patients with COVID-19, after adjusting for other variables, was 7.2% (Table 4). The results of multiple linear regression showed that the place of residence was a significant positive predictor of the time effectiveness component (β=0.584, p=0.008) and in the present study, it was able to predict and explain 5.3% of the changes related to time effectiveness (Table 4).

According to the data, the variables of age (β=0.081, p=0.003), education (β=2.448, p=0.001), and place of residence (β=1.318, p=0.046) were able to positively and significantly predict religious activity. The effect of the above component on the religious activity of patients with COVID-19 was 8.3% after adjusting for other variables (Table 4). The results showed that the total hope score (β=0.101, p=0.0001) could positively predict physical self-care performance and gender (β=-1.181, p=0.022) could negatively predict physical self-care performance. These variables could explain 9.2% of the variance in physical self-care of patients with COVID-19 after adjusting for other variables (Table 4).

Discussion

The results of data analysis showed that there was a significant positive association between hope and the subcomponents of agency thinking and pathway thinking with self-care. Increasing the hope construct and using agency thinking and pathway thinking improved and promoted self-care performance in patients with COVID-19. Nasiri et al. have also shown that people who had more hope had more self-esteem and greater commitment to health-related activities. These people believed that they could be more adaptable in dealing with life challenges and develop the internal discourse to finish this task and that they should not fail or be disappointed (15). Hope for the future had the highest association with existential well-being (24). In the explanation of the above finding, it can be acknowledged that hope is a psychological element and can be associated with a sense of satisfaction, purposefulness, and health. Therefore, the existence of a positive and strong relationship between hope and self-care is largely logical and expected. Since increasing self-care can reduce the patient's need for primary care, reduce the use of hospital resources, and also reduce health costs (5), strengthening the hope construct in patients is essential and of great importance to improve self-care performance.

The findings showed that there was a significant positive association between the construct of hope and some self-care components, including communication effectiveness, coping with problems, and physical self-care. With increased hope, patients were more connected, more capable in coping with problems, and had higher physical self-care. Studies indicated that hope is directly correlated with positive emotions (25) and inversely correlated with negative emotions (13). Hopeful people have more emotions and

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connectedness. Asgari et al. also believe that hope is an emotional force that directs the imagination towards positive things, energizes and equips people, and acts as a catalyst for action and work. Hope causes joy, optimism, happiness, flexibility, and the ability to escape from the problems and harms that are imposed on the individual in life (26). Hopeful people are highly motivated. Such a resource gives the individual a sense of meaning and strength in the face of problems (24). Having hope and meaning in life in problematic circumstances is among the ways that help people experience less stress when facing harmful events, misfortunes, and problems and maintain their health at an optimal level. People who live with purpose and hope are better able to engage in activities (27). People who have more hope have better coping skills in dealing with stress, use less denial, and use more problem-focused coping methods. Therefore, these conditions contribute to better coping with problems (12). In this regard, Snyder et al. believe that hopeful and optimistic people are less likely to suffer from poor physical health when facing life's problems. Therefore, the level of hope can be a strong predictor of health (13). There is an association between high levels of hope and people's success in activities, better physical and mental health, and more effective treatment methods in patients (15). Therefore, patients with a positive perception of hope have more effective communication, better coping with problems, and better self-care, thus ensuring improved physical health and increased mental health during the illness.

The results of data analysis showed that the variable of age was significantly and positively associated with self-care and some of its components, including self-awareness and personal and religious activity. These results were in contrast to similar studies which showed that old age was an effective factor in the weakness of patients' self-care (28), and that patients' age was not significantly associated with patients' self-care performance (29). In this regard, in a systematic review of mental health complications in the COVID-19 pandemic, Vindegaard et al. reported that older patients with the disease were more anxious and pessimistic about their condition, while younger people had a more positive attitude towards this issue (30). However, in line with the results of the present study, it was demonstrated that young people showed more severe reactions compared to adults, given the ambiguous predictions they had about death (31). On the other hand, studies have shown that longevity is significantly and positively correlated with religious observances and attachments (32), and it can be acknowledged that older people have stronger religious beliefs and consequently greater self-awareness, which is consistent with the present study.

The findings showed that the variable of gender was able to positively predict the maintenance and development of a support system and negatively predict physical self-care. Evaluation of gender differences in the present study showed that the mean score of maintenance and development of a support system was higher in women but the mean score of physical self-care was lower. In a study by Moeini et al., there was no significant relationship between gender and patients' self-care performance (29). In a systematic review of mental health complications in the COVID-19 pandemic, it was reported that female patients are more likely to express their emotions and show anxiety, while men tend to suppress their emotions and show their anger (30). In examining the relationship between gender and the fear and anxiety caused by the COVID-19 pandemic, Metin et al. showed a strong relationship between gender and the fear and anxiety caused by the disease. The outbreak of the disease had a more negative impact on women. Women perceived COVID-19 as a greater threat to personal and population health than men and had more fear and anxiety (33). In this regard, Mohammadi Zeidi et al. have shown that one of the most important psychological variables affecting the regular implementation of health behaviors in COVID-19 is fear (34). This makes it necessary to have more support in women's community. In fact, benefiting from social support causes less stress and maintains the individual's health at an optimal level (27). Moreover, solidarity between family members during the crisis is deeply inspiring for patients, especially women. The relationship network factor can have a great impact on the stress caused by COVID-19 (35).

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Studies have also shown that women, as the beating heart of the family and society, have a great responsibility in these communities. Being mothers, daughters, and sisters, as well as many other roles that women play in the family and society, may be the reason for less attention to self-care regarding their physical health. Therefore, the health of this group requires more attention (36). Contrary to the results of the present study, in a study by Parham et al., the average self-care score in women was higher than that of men, and women had better self-care than men (37). In explaining these findings, it should be said that the sources of hope are different for the two genders. In men, economic satisfaction, job, etc. are more important, while in women, they are more affected by the health of the family, children, etc. (12). It seems that these differences may be due to the influence of cultural factors on the self-care behaviors of patients.

Based on the results, the variable of education could positively and significantly predict the component of personal and religious activity of self-care. A study by Mahdilouy et al. showed that the mean self-care score in people with education more than high school diploma was also higher compared to people with lower education, which could indicate that education is a facilitating factor in various dimensions of the self-care process. Higher education level was associated with more effective self-care among patients; thus, education in groups with lower literacy levels should be emphasized (38). Furthermore, in their study, Moeini et al. showed that the level of education is significantly related to self-care behaviors. People with less than high school education had a worse situation in terms of self-care behaviors. Hier level of education of patients increases their awareness about self-care of the disease (29). Today, religious coping behaviors, including prayer, faith in God, and participation in collective rituals, are considered to be one of the main determinants of health behaviors because they can have positive effects on behavioral strategies for self-care (39). Since self-care behavior requires knowledge, skills, and resources, with the increase in awareness of various aspects of the disease, it can be expected that individual activity in self-care performance will increase in people with higher education (40). It can also be stated that people with higher education have easier access to educational resources.

Research data have shown that the place of residence was a predictor of self-care and components of self-awareness, communication effectiveness, time effectiveness, and religious activity. In other words, compared to urban residents, rural people had higher self-care and self-awareness performance, were more religiously active, spent more time participating in activities to enjoy themselves, and spent more time resting or getting enough sleep. Beiranvandpour et al. believed that the environment can affect an individual's behavior. Self-care is also a behavior that is affected by various factors, and the environment is one of the most important factors affecting it (40). Amirian et al. have shown that the physical, social, and emotional dimensions were more favorable in rural patients than in urban patients. The lifestyle of rural people and their activity can serve as a model for urban patients (41). Rural patients believed that the expansive life, beautiful nature, open space, and clean air all contributed to their well-being (42). Moreover, the occupation of most villagers is gardening, and more physical activity in the countryside can lead to more individual activity, while in the case of urban patients, people have a sedentary lifestyle and are more dependent on mechanical life (41). In explaining the above findings, it can be admitted that close social relations between families in the village and the existence of special customs and traditions are one of the possible reasons for these differences. In other words, such differences due to cultural and religious differences and the type of special religious rituals and customs in rural areas can be considered probable.

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In this study, it was shown that the variable of length of stay was only a significant positive predictor of self-awareness. Patients who were hospitalized for a longer period of time had more self-awareness. The results of this study were inconsistent with previous studies which showed that the duration of illness was not significantly associated with self-care performance (29) or that patients who were recently diagnosed with the disease had better performance (43). Adwan et al. also showed that there was a weak and inverse relationship between the duration of illness and self-care. This means that with the increase in the duration of illness, self-management and disease control activities decreased (44), while Mahdilouy et al. reported that the self-care score was higher among patients with longer duration of illness (38). In explanation of the above finding, it can be stated that the increase in hospitalization time is the best opportunity for self-care education to promote self-awareness about COVID-19 in patients with the help of the medical staff during the provision of care services. It seems that the difference in patients' self-care status based on the duration of infection in other studies is also due to various factors such as self-care education programs for patients, the level of awareness and attitude towards self-care, and how patients' self-care is measured.

According to the results of the present study, it can be concluded that with the increase in hope and other adaptive human strengths among patients, the level of self-care in them increases, and this can lead to improved health and accelerated recovery from the disease. Although the findings of this study have partially filled the knowledge gap regarding the relevant variables in the self-care performance of patients with COVID-19, it is necessary to be cautious in applying the results of this study to other groups and other cultural samples. Moreover, considering the association between hope and some demographic variables with self-care, it is suggested that health-care organizations provide a basis for strengthening patients' perception of self-care by considering motivating factors.

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