

# Providing a health-promotion behaviors model in elderly: Psychological capital, perceived social support, and attitudes toward death with mediating role of cognitive emotion regulation strategies

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## Abstract

**Background and Aims:** The aim of this study was to present a health-promotion behaviors model in the elderly based on psychological capital, social support, and attitudes toward death mediated with mediating role of emotional cognitive regulation strategies in the elderly in Ardabil.

**Methods:** The research method was correlational which was done by the path analysis method. The statistical population of the study consisted of all elderly people in Ardabil in 2020, from which 250 people were selected by convenient sampling method and were investigated with research tools including Health-Promotion Lifestyle Profile (1998), attitudes toward death profile (1994), Psychological Capitals (2007), social support (1988) and Cognitive Emotion Regulation (2001). Data were analyzed by Amos-24 software and using structural equation modeling.

**Results:** The results showed that psychological capital, social support, and attitude towards death directly affect health-promotion behaviors and also indirectly improve them through cognitive emotion regulation strategies. These results can have a significant impact on promoting health and improving the quality of life of the elderly population.

**Conclusions:** Based on the findings of the present study, it can be claimed that the proposed model for the health of the elderly has an acceptable fitness and this model can be used in developing educational programs and intervention techniques to improve the health of this group of people.

## KEYWORDS

attitude toward death, cognitive emotion regulation strategies, elderly, health promotion behaviors, perceived social support, psychological capital

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## 1 | BACKGROUND

The elderly population is one of the most important demographic phenomena in the world at the end of the twentieth century and the beginning of the twenty-first century. Aging is a period of growth that is accompanied by certain changes. Aging changes include issues such as decreased physical fitness, changes in the body's response to medication, experiencing important life events such as retirement, living in a nursing home, declining income, loss of social support, and less participation in society.<sup>1</sup>

Given the dramatic increase in the elderly population in Iran in recent decades, and considering the fact that 50% of Iran's population is now young, it is predicted that by 2050 we will face an explosion of aging and 26 million and three hundred thousand of Iran's population will be elderly.<sup>2</sup> As the elderly population grows, the specific needs of the elderly, including medicine, psychology, and rehabilitation, increase. Aging is a process with reduced performance and independence and increased disease and the need for care, all of which make the elderly vulnerable.<sup>3,4</sup>

Elderly people may also be psychologically and emotionally disadvantaged due to physical weakness, low perceived social support, loneliness, and reduced ability to perform daily life tasks, and report more depression and anxiety based on research findings, and experience some anxiety or even existential crises.<sup>5</sup> Therefore, considering the size of this community, paying attention to education and the ability of the elderly to meet the challenges of this period and improve behaviors that promote aging health is an important step in preventing the damage of the aging period.

One of the ways to promote the health of the elderly and the most basic way to prevent the injuries of old age is self-care.<sup>6,7</sup> In fact, self-care is a promising path that affects the resilience of the elderly.<sup>8</sup> Self-care as a learned regulatory function means the ability to perform self-care practices.<sup>9</sup> and is the way in which individuals strive to prevent illness and disability and improve their health.<sup>10,11</sup> Self-care activities can lead people to stay healthy and well, adapt and reduce disability and health care costs.<sup>12</sup> The most important achievement of strengthening self-care is that participants make the right decisions about the proper use of health care and choose and implement appropriate self-care behaviors.<sup>13</sup> Research shows that self-care behaviors directly improve health and quality of life and reduce morbidity and mortality.<sup>14</sup> Based on the Orem and Vardiman<sup>15</sup> model of self-care, Hemmati and Hashemloo have identified five dimensions of self-care in Iranian society, which include physical self-care, emotional self-care, social self-care, daily self-care, and self-care during illness. Therefore, understanding the psychological, social, value, and attitude factors in the self-care of the elderly can help to understand and apply the patterns of self-care in the Iranian elderly.<sup>16</sup>

Another factor that seems to play an important role in the self-care of the elderly is psychological capital. Psychological capital is one of the indicators of positive psychology, which is defined by characteristics such as a person's belief in his/her abilities to achieve success, have perseverance in pursuing a goal, create positive

documents about himself/herself and endure problems.<sup>17</sup> In other words, a positive assessment of the situation and the probability of success is driven by motivational-based efforts and perseverance.<sup>18</sup> According to Luthans et al.<sup>19</sup> psychological capital can be considered as a competitive advantage through investing in individuals. Four indicators of self-efficacy, hope, positive thinking, and resilience are considered for psychological capital.<sup>20</sup> Hodges<sup>21</sup> confirmed the relationship between psychological capital and self-care.<sup>21</sup> In Iran, Barghi et al.<sup>22</sup> showed that there is a relationship between psychological capital and self-care of the elderly.

Social support can be another effective factor in the self-care of the elderly. Social support plays an important role in relieving the negative effects of the disease on the patient's psychological dimension and is associated with less distress experience, a greater sense of control, improved self-confidence, reduced negative effects on life, and improved quality of life.<sup>23</sup> Social support is considered in both received and perceived forms. Perceived social support indicates the individual's assessment of the availability of support when necessary and needed, but the received support is the amount of support received by the individual.<sup>24</sup> Stacey et al.<sup>25</sup> examined the relationship between self-care and social support and concluded that these two variables have a significant relationship with each other. Reife et al.<sup>26</sup> inspected the impact of social support on coping techniques and showed that by increasing social support, individuals use more effective coping methods and experience a better mental health status. Stapley et al.<sup>27</sup> concluded that self-care behaviors and social support play an important role in people's health and their ability to stress.

Existential issues such as attitudes toward death are not necessarily clinical but can be distressing if left untreated.<sup>28</sup> Self-care in the elderly can be affected by attitudes toward death. Today, death studies, as an interdisciplinary field, investigates behaviors and feelings related to death, dying, and mourning. The sociology of death deals with how death shapes and directs the structure of institutional values, beliefs, and arrangements because death is a global phenomenon, but the attitude towards it is different from one society to another.<sup>29</sup> Researchers state that the approach acceptance of death indicates the belief in a good life after death. They consider death acceptance as an approximate and relative comfort along with an individual's awareness of personal mortality.<sup>30</sup> Neimeyer<sup>31</sup> showed that neutral acceptance and death acceptance have a positive relationship with mental health and a negative relationship with depression, and neutral acceptance has a positive relationship with perceived physical health and death avoidance has a negative correlation with perceived physical and mental health. Flocke et al. (2010) in their study examined the factors affecting the lifestyle of the elderly and concluded that having an unhealthy lifestyle is a major cause of mortality and preventable complications among the elderly.<sup>32</sup> Azaiza et al.<sup>33</sup> evaluated the attitude toward death in the elderly and showed that community and family support is very important in reducing death anxiety in the elderly. Sansó et al.<sup>34</sup> in a study showed that there is a relationship between self-care styles and coping with death.

Emotions have a biological basis but can affect the ways in which they are expressed, and cognitive emotion regulation is defined as the process of initiating, maintaining, modifying, or changing the onset, intensity, or persistence of inner feelings and emotions related to social, psychological, and physical processes in the achievement of a goal.<sup>35</sup> People use different methods to regulate their emotions, and one of the most common of these methods is to use emotional cognitive regulation strategies. Therefore, one of the variables that can play a mediating role among research variables is emotional regulation. Emotional regulation is defined as the process of initiating, maintaining, modifying, or changing the intensity or persistence of inner feelings and emotions associated with psychosocial, physical, and social processes in achieving one's goals.<sup>36</sup> The ability to regulate cognitive emotion is universal.<sup>37</sup> Therefore, in response to their experiences, people control and regulate their emotions through different methods.<sup>38</sup>

Coping strategies include blame yourself, reception, rumination, positive focus restoration, focus on planning, positive evaluation, viewpoints, catastrophe, and blame others, which each has its own consequences.<sup>39</sup> Volandes et al.,<sup>40</sup> in their research, examined the health-promoting factors in the elderly and showed that one of the most important self-care behaviors that promote health in the elderly is emotional regulation.<sup>41</sup> Haga et al.<sup>42</sup> in a study reported the relationship between cognitive emotion regulation, social support, and self-efficacy as a component of psychological capital.

Previous studies have shown that various factors can affect older adults' health. The majority of studies have also highlighted the possibility of improving the health of older adults. Thus, further research into possible factors affecting older adults' health can contribute to improving their health. Accordingly, a survey of the role of each component of psychological capital, social support, and attitudes toward death with a focus on the impact of emotions on older adults' health can pave the way for finding effective solutions at the micro and macro levels and also improving the health status of older adults because identifying these factors makes it possible to take effective measures to reduce the negative consequences caused by them. This highlights the need for more research in this field. Moreover, conducting quantitative studies will reveal the effect of variables on each other, and the most effective variables can be employed in clinical interventions. In addition, no study has addressed emotion regulation as a moderating variable in older adults' health. Thus, the findings of this study can have significant theoretical and practical implications. Theoretically, our findings can extend the literature and induce further research, especially into mediating and moderating variables. What's more, the findings of this study can have some practical implications for elderly care centers and families with older adults.

In general, the main issue in this study was to investigate the mediating role of cognitive emotion regulation among psychological capital, social support, and attitudes toward death with health-promotion behaviors in the elderly. Based on this, thus in addition to the model fit test, the direct and indirect effects and total variables on each other were examined.

## 2 | MATERIALS AND METHODS

The research method is applied and correlational, and the statistical population of the study consisted of all the elderly between 65 and 85 years old in Ardabil in 2020. Among them, 250 elderly people were selected as the research sample by convenient sampling method and responded to the research tool.

Kline<sup>43</sup> suggested that the number of participants equal to or greater than 200 can be adequate to run structural equation modeling.<sup>44</sup> Before performing the statistical analysis, the data were screened, and univariate outliers were identified with a box plot, but no subject was excluded. Multivariate outliers were searched with Mahalanobis statistics, but no outliers were found.

### 2.1 | Data collection tools

#### 2.1.1 | Health Promotion Lifestyle profile (II)

This scale was designed by Walker et al.<sup>45</sup> and includes 52 questions with a 4-point Likert scale from never (1 point) to forever (4 points). This questionnaire measures health-promotion behaviors in 6 dimensions including health responsibility, physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management. Higher scores indicate a better situation for people in terms of health-promotion behaviors. The reliability of this tool based on Cronbach's  $\alpha$  index was reported to be 0.94.<sup>46</sup>

#### 2.1.2 | Death Attitude Profile-Revised (DAP-R)

This scale was developed in 1994 by Wong et al. Factor analysis of main components has confirmed the existence of five dimensions of the death attitude scale. These five dimensions are<sup>1</sup> fear of death: negative thoughts and feelings about the state and process of dying,<sup>2</sup> approach acceptance: looking at death as a way to happiness after life,<sup>3</sup> Escape Acceptance: Considering death as an escape from a life full of pain,<sup>4</sup> Neutral acceptance: A view of death as a fact that is neither frightening nor passionate, and Death Avoidance: Avoiding to think or talk about death for reducing anxiety, which involves the use of defense mechanisms to keep the subject of death away from consciousness. Respondents to this questionnaire identify their answers on a 7-point Likert scale from Strongly Agree to Strongly Disagree. All scales have internal reliability, stability and validity. Appropriate factor loading and good to high  $\alpha$  coefficients indicate that the factors are pure and internally stable. Internal reliability ( $\alpha$  coefficients) of these 5 dimensions have been reported from 0.65 for neutral acceptance subscale to 0.97 for approach acceptance subscale and retest reliability coefficient from 0.61 for death avoidance subscale to 0.95 approach acceptance.<sup>46</sup>

### 2.1.3 | Psychological Capital Questionnaire

This questionnaire was developed by Luthans et al.<sup>18</sup> This questionnaire consists of standard values that measure the constructs of self-efficacy, optimism, hope, and resiliency. This questionnaire consists of 24 items and 4 subscales including self-efficacy, optimism, hope, and resiliency that each subscale has 6 items. Numerous studies have shown the validity and reliability of this scale at the intercultural and occupational level, and the validity and reliability of these subscales have also been confirmed.<sup>18</sup> In Luthans et al.<sup>18</sup> the  $\chi^2$  ratio of this test was 24.6 and the comparative fit index (CFI) and RMSEA statistics in this model were 0.97 and 0.08, respectively.<sup>18</sup>

### 2.1.4 | Multidimensional Scale of Perceived Social Support

This scale is a 12-item tool developed by Zimet et al.<sup>47</sup> to assess perceived social support from three sources, that is, family, friends, and important people in life. This scale measures a person's perceived social support in each of these three areas in a 7-point range of strongly disagree to strongly agree. Obtaining the total score of this scale is carried out by summing the scores of all items are added together and dividing by their number.<sup>12</sup> The score of each subscale is also obtained from the sum of the scores of the items related to it divided by the number of items of that subscale.<sup>4</sup> The validity and reliability of this scale have been reported to be optimal by Zimet et al.

### 2.1.5 | Cognitive-Emotion Regulation Questionnaire

This questionnaire was developed by Garnefski et al.<sup>48</sup> This self-report questionnaire, which measures cognitive components with 36 items, is scored on a 5-point Likert scale. Garnefski et al. (2001) consider Cronbach's  $\alpha$  coefficient for factors including positive refocusing, planning, positive reappraisal, putting into perspective, blaming others, self-blame, rumination, Catastrophizing, and acceptance of the situation equal to 0.81, 0.81, 0.72, 0.68, 0.81, and 0.72, respectively and showed that these subscales can be divided into two groups of adapted and maladaptive emotion strategies. Adapted strategies include acceptance of situations, positive refocusing, planning, positive reappraisal, and putting into perspective. Maladaptive strategies include self-blame, blaming others, rumination, and Catastrophizing. Samani et al.<sup>49</sup> used the factor analysis method to examine the factor structure of the cognitive emotion regulation scale for its application in Iranian culture. Cronbach's  $\alpha$  coefficients for positive refocusing, planning, positive reappraisal, putting into perspective, blaming others, self-blame, rumination, Catastrophizing and acceptance of conditions were obtained to be 0.91, 0.73, 0.79, 0.80, 0.65, 0.66, and 0.62, respectively. The retest coefficient of the questionnaire was calculated during 1 week, which varied between 0.75 and 0.88 for different factors.

## 2.2 | Data analyses

After collecting data, Pearson correlation was used to evaluate the relationships between variables. SPSS-25 and EMOS-24 software were also used to evaluate the direct and indirect effects of variables.

Moreover, the missing data (less than 2%) were replaced using the regression imputation method in SPSS 25. Outliers were checked using the Mahalanobis value in AMOS 24 and the values greater than 2.5 were considered outliers.<sup>43</sup> However, the results revealed no outliers. The normality of the data was checked using cutoff values for skewness ( $\pm 2$ ) and kurtosis ( $\pm 3$ ). The results showed that the data were normally distributed.<sup>44</sup>

## 3 | RESULTS

### 3.1 | Sample characteristics

In the present study, 132 (53%) of the participants were female and 118 (47%) were Man. Also, 51 participants in the study had an age between 65 and 70 years old; 76 people had age between 71 and 75 years old; 105 people had age between 76 and 80 years old, and 68 people had the age between 81 and 85 years old.

Table 1 provides a statistical description of scores related to the variables of psychological capital, social support, attitude toward death, cognitive emotion regulation strategies, and health-promotion behaviors, including skewness and elongation, along with mean and standard deviation scores.

According to the information obtained, the mean psychological capital is equal to 75.93, social support is equal to 14.87; fear of death is equal to 32.30; death avoidance is equal to 18.98, neutral acceptance is equal to 26.32; approach acceptance is equal to 42.58; escape acceptance is equal to 23.57; adaptive emotion regulation strategy is equal to 32.25; maladaptive emotion regulation strategy is equal to 23.57, and the mean of health-promotion behaviors is equal to 22.38. Also, due to the fact that the values of skewness and elongation of the data are between +2 and -2, the data have a normal distribution at the level of 0.05.

Before performing the hypothesis test, the normality of the data distribution should be tested. For this purpose, the Kolmogorov-Smirnov test was used to determine the type of data distribution. The results showed that the level of significance of the calculated statistic for all variables is greater than 0.05, so the assumption of normal distribution of scores is accepted. Also, tolerance and variance inflation factor (VIF) indices were used to examine the existence of multicollinearity between variables. A tolerance of less than 0.1 or a VIF greater than 10 indicates multicollinearity. Based on the results, no deviation from the assumption of linear multicollinearity was observed in any of the values of tolerance and VIF statistics calculated for the research variables.

Table 2 shows the results of the correlation between psychological capital, social support, attitudes toward death, and cognitive emotion regulation strategies with health-promotion behaviors.

**TABLE 1** Descriptive measures of mean and standard deviation of research variables

	Skewness	Elongation	Mean	Standard deviation
Psychological capital	-0.028	-0.004	75.93	15.912
Social support	-0.792	0.989	14.87	2.368
Fear of death	0.103	-0.234	32.30	6.135
Death avoidance	0.424	1.330	18.98	3.684
Neutral acceptance	-0.645	0.753	26.32	3.850
Approach acceptance	-0.462	0.620	42.58	7.629
Escape acceptance	-1.009	1.219	23.57	3.157
Adaptive emotion regulation strategy	-0.239	0.760	32.25	4.631
Maladaptive emotion regulation strategy	0.527	0.801	23.57	4.384
Health-promotion behaviors	-0.502	1.007	22.38	3.090

**TABLE 2** Pearson correlation coefficients among the variable ( $n = 250$ )

Variable	1	2	3	4	5	6	7	8	9	10
Psychological capital	1									
Social support	0.522*	1								
Fear of death	-0.216*	-0.231*	1							
Death avoidance	-0.418*	0.592*	0.171*	1						
Neutral acceptance	0.392*	0.528*	-0.230*	-0.463*	1					
Approach acceptance	0.390*	0.485*	-0.095	-0.699*	0.405*	1				
Escape acceptance	0.389*	0.407*	-0.080	-0.492*	0.387*	0.501**	1			
Adaptive emotion regulation strategy	0.557*	0.613*	-0.186*	-0.623*	0.490*	0.585*	0.508*	1		
Maladaptive emotion regulation strategy	-0.518*	-0.588*	0.200*	0.619*	0.490*	-0.570*	-0.499*	-0.719*	1	
Health-promotion behaviors	0.630*	0.810*	-0.276*	-0.705*	0.577*	0.617**	0.510*	0.723*	-0.698*	1

\*Significance at the level of 0.01.

\*\*Significance at the level of 0.05.

### 3.2 | Correlational analysis

Based on the results, all correlation coefficients calculated are significant ( $p < 0.01$ ). Psychological capital ( $r = 0.61$ ,  $p < 0.01$ ), social support ( $r = 0.81$ ,  $p < 0.01$ ), neutral acceptance ( $r = 0.58$ ,  $p < 0.01$ ), approach acceptance ( $r = 0.62$ ,  $p < 0.01$ ), and escape acceptance ( $r = 0.51$ ,  $p < 0.01$ ) had significantly positive correlations with health-promotion behaviors. However, fear of death ( $r = -0.28$ ,  $p < 0.01$ ) and death avoidance ( $r = -0.70$ ,  $p < 0.01$ ) had negative correlations with health-promotion behaviors. There was a positive correlation between adaptive emotion-regulation strategy and health-promotion behaviors ( $r = 0.72$ ,  $p < 0.01$ ), and a negative relationship between maladaptive emotion-regulation strategy and health-promotion behaviors ( $r = -0.70$ ,  $p < 0.01$ ).

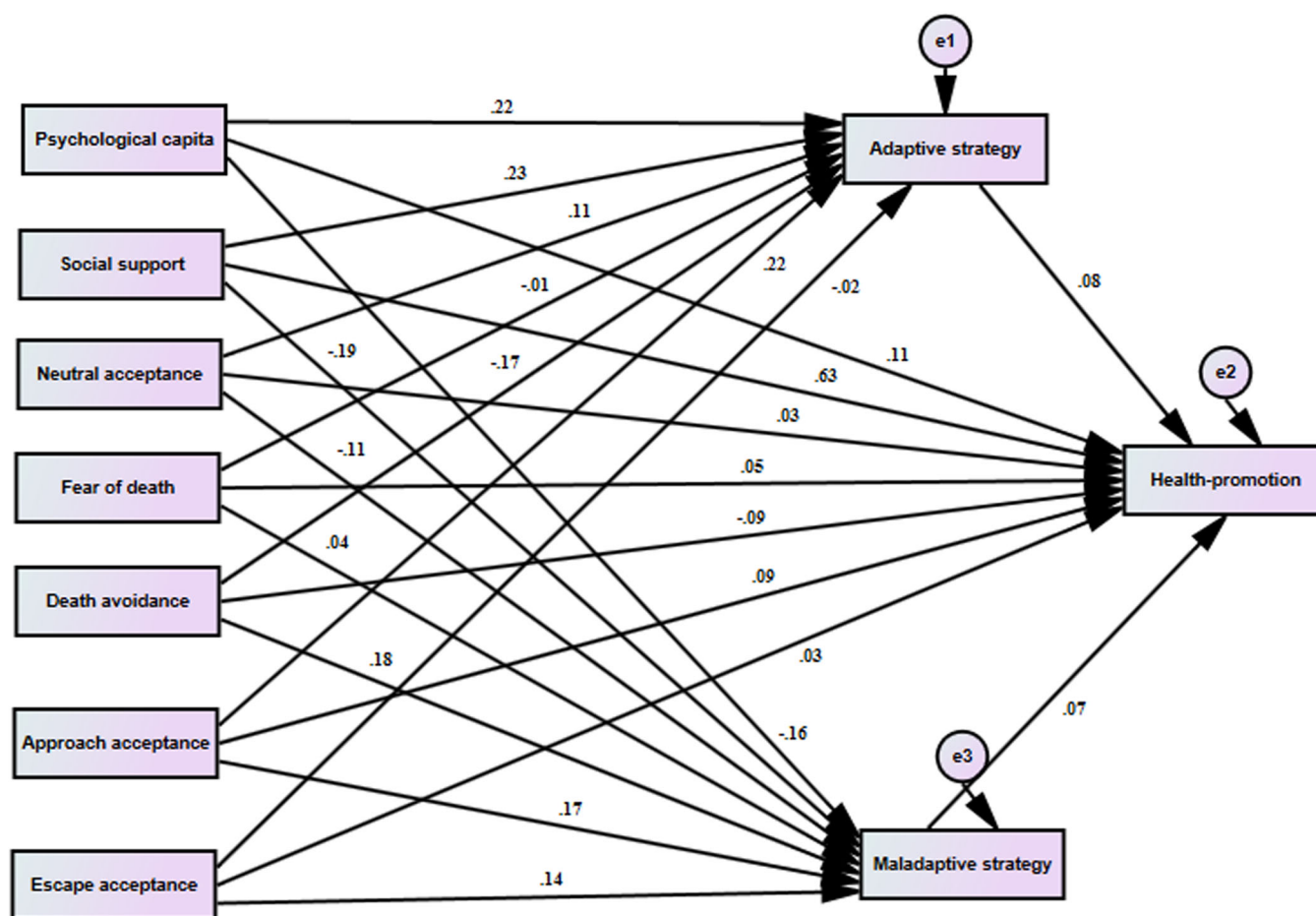
To investigate the mediating role of cognitive emotion regulation strategies in the relationship between psychological capital, social support, and attitude toward death with aging health-promotion

behaviors, path analysis was used. Figure 1 shows the standard coefficients of the proposed model to investigate the mediating role of cognitive emotion regulation strategies in the relationship between psychological capital, social support, and attitudes toward death with health-promotion behaviors in the elderly.

### 3.3 | Model fitness

The fit of the proposed model with the data based on the fit indices is reported in Table 3. To provide a suitable model, normalized  $\chi^2$  index, comparative fit index, and goodness of fit index are suggested. A general rule for fitness indicators is that values equal to or greater than 0.9 are acceptable. In addition, if values of the root mean square error of approximation is between 0.03 and 0.08, it is acceptable.<sup>43</sup>

The  $\chi^2$  to degrees of freedom ratio index ( $df/\chi^2$ ) confirms the fit of the model.  $df/\chi^2$ , which is in the range of 1 to 5 and means the fit



**FIGURE 1** Standard coefficients of the model related to the mediating role of cognitive emotion regulation strategies in the relationship between psychological capital, social support and attitudes toward death with health-promotion behaviors

**TABLE 3** Model fit indices

Fit index	Acceptable domain	Observed value	Fit index evaluation
IFI	>0.9	0.974	Acceptable
GFI	>0.9	0.968	Acceptable
SRMR	<0.08	0.027	Acceptable
CFI	>0.9	0.973	Acceptable
NFI	>0.9	0.972	Acceptable

Abbreviations: CFI, comparative fit index; IFI, incremental fit index; GFI, goodness-of-fit index; NFI, normed fit index, SRMR, standardized root of the mean squared residual.

of the model to the data. The standardized root of the mean squared residual (SRMR) is 0.027, which is less than the criterion (0.08) and thus confirms the fit of the model. Finally, incremental fit index, CFI, goodness-of-fit index, and normed fit index indices are larger than the desired criterion (0.9). Table 4 also shows the standardized direct path coefficients.

As can be seen in Table 4, the path coefficient related to the effect of psychological capital on health-promotion behaviors in

older adults is positive ( $\beta = 0.11$ ,  $p < 0.01$ ). Similarly, the path coefficient related to the effect of social support on health-promotion behaviors in older adults is positive ( $\beta = 0.63$ ,  $p < 0.01$ ). Moreover, the path coefficients related to the relationship between fear of death ( $\beta = -0.05$ ,  $p < 0.05$ ) and death avoidance ( $\beta = -0.07$ ,  $p < 0.05$ ) with health-promotion behaviors are negative and there is a positive relationship between approach acceptance and health-promotion behaviors in older adults ( $\beta = 0.09$ ,  $p < 0.05$ ). However, neutral acceptance and escape acceptance had no significant relationship with health-promotion behaviors in older adults. Intermediate paths were investigated using the bootstrap method, as detailed in Table 5.

Following the results, social support had an indirect significant impact on health-promotion behaviors in older adults through the moderating role of cognitive emotion regulation strategies ( $\beta = -0.031$ ,  $p < 0.01$ ). Moreover, psychological capital, mediated by cognitive emotion regulation strategies, has a significant effect on health-promotion behaviors in older adults ( $\beta = -0.029$ ,  $p < 0.05$ ). The results indicated that the components of attitudes towards death (except the fear of death) mediated by cognitive emotion regulation strategies had an indirect and significant effect on health-promoting behaviors in older adults ( $p < 0.05$ ).

**TABLE 4** Standard paths and coefficients in the model

	Variables	Standardized	C.R.	p
Direct effects	Health-promotion behaviors←Psychological capital	0.110	4.433*	<0.001
	Health-promotion behaviors←Social support	0.629	22.604*	<0.001
	Health-promotion behaviors←Fear of death	-0.046	-2.228**	0.022
	Health-promotion behaviors←Death avoidance	-0.086	-2.784**	0.005
	Health-promotion behaviors←Neutral acceptance	0.030	1.262	0.207
	Health-promotion behaviors←Approach acceptance	0.090	3.118**	0.002
	Health-promotion behaviors←Escape acceptance	0.034	1.432	0.152

\* $p < 0.01$  level (2-tailed).\*\* $P < 0.05$  level (2-tailed).**TABLE 5** Indicators of bootstrap test for measuring indirect relationships in the model

Variables	Standardized	p
Social support <--- Cognitive regulation strategy <-- health promotion behavior	<b>-0.031</b>	<b>0.009</b>
Psychological capital <--- Cognitive regulation strategy <-- health promotion behavior	<b>-0.029</b>	<b>0.015</b>
Fear of death <--- Cognitive regulation strategy <-- health promotion behavior	-0.003	0.503
Death avoidance <--- Cognitive regulation strategy <-- health promotion behavior	<b>-0.026</b>	<b>0.032</b>
Neutral acceptance <--- Cognitive regulation strategy <-- health promotion behavior	<b>0.017</b>	<b>0.020</b>
Escape acceptance <--- Cognitive regulation strategy <-- health promotion behavior	<b>0.010</b>	<b>0.048</b>
Approach acceptance <--- Cognitive regulation strategy <-- health promotion behavior	<b>0.029</b>	<b>0.003</b>

Note: Bold number are paths that are significant at the 0.05 level.

### 3.4 | Moderation test of gender

A multigroup analysis was used to test gender differences in the proposed model. The difference in  $\chi^2$  values between the two models was not statistically significant ( $\Delta\chi^2 = 21.3$ ,  $p = 0.593$ ), indicating that gender does not have a moderating role.

## 4 | DISCUSSION

The aim of this study was to present a model of health-promotion behaviors in the elderly based on psychological capital, perceived social support, and attitude toward death with mediating role of emotional cognitive regulation strategies in the elderly in Ardabil. The results of data analysis showed that psychological capital, perceived social support and attitude towards death directly affect health-promotion behaviors and also improve them indirectly and through emotional cognitive regulation strategies.

Regarding the first hypothesis of the study, that is, psychological capital has a positive and direct effect on health-promotion behaviors in the elderly, the results of data analysis showed that the path coefficient related to the effect of psychological capital on positive health-promotion behaviors is significant. Considering the

significance of the obtained coefficient, the research hypothesis, that is, the positive effect of psychological capital on behaviors promotion health in the elderly, is confirmed.

Based on this, it is concluded that with an increase in psychological capital, health-promotion behaviors in the elderly also increase. This finding is consistent with the research of Hodges.<sup>21</sup> For explaining this finding, it can be said that psychological capital is a high-level conceptual structure that has important implications for people's health because its sub-components are able to explain the level of physical and mental health of individuals and ultimately lead to their well-being, although it is important to note that all components of psychological capital (self-efficacy, optimism, flexibility, and hope) work together to improve health-promotion behaviors in individuals.<sup>21</sup>

Regarding the positive and direct effect of social support on health-promotion behaviors in the elderly, the present study showed that the path coefficient related to the effect of social support on health-promotion behaviors in the elderly is positive and significant. Considering the significance of the obtained coefficient, the research hypothesis, that is, the positive effect of social support on behaviors that promote aging health is confirmed. Based on this, it is concluded that with increasing social support, health-promotion behaviors in the elderly also increase. This finding is in line with the studies of Stacey

et al., Reef et al., and Stapley et al.<sup>25-27</sup> In fact, social support facilitates healthy behaviors. Elderly people with adequate social support are more successful in following the recommended diet and medication. On the other hand, socially isolated elderly may find it difficult to change their behavioral patterns, which makes them vulnerable.<sup>25</sup>

Regarding the direct effect of attitude toward death on health-promotion behaviors in the elderly, the results showed that the path coefficients related to the relationship between fear of death and death avoidance with health-promotion behaviors were negative and the relationship between approach acceptance and health-promotion behaviors was positive and meaningful. The relationship between neutral acceptance and escape acceptance with aging health-promotion behaviors is not significant. In this regard, Jaroslaw et al.<sup>13</sup> reported the role of self-care in reducing the risk of death in the elderly.<sup>13</sup> Stange et al. in their study examined the factors affecting the lifestyle of the elderly and concluded that having an unhealthy lifestyle is a major cause of mortality and preventable complications among the elderly.<sup>32</sup> Sanso et al.<sup>34</sup> also showed that there is a relationship between self-care styles and coping with death. Mental preoccupation with death, especially in old age, is something that exists in almost the majority of people, and their psychological consequences are determined depending on the attitude that people have towards death and the end of worldly life. People who have a positive attitude towards death and actively accept death as a way to achieve eternal happiness and accept the fact that death is not inexistence and annihilation, but a transfer from the world to another world in which human life continues in a different way, they are always hopeful, and in addition to having higher mental health, they also take more appropriate behaviors to take care of themselves.<sup>34</sup>

Other hypotheses of the present study were to investigate the effect of psychological capital, social support and attitudes toward death on health-promotion behaviors in the elderly with mediating role of cognitive emotion regulation strategies. Based on the results, the coefficients related to the indirect impact of psychological capital, social support, and attitude toward death on health-promotion behaviors in the elderly with mediating role of the cognitive emotion regulation strategies are significant. Therefore, the research hypothesis, that is, the mediating role of cognitive emotion regulation strategies in the relationship between psychological capital, social support, and attitudes toward death with health-promotion behaviors in the elderly is confirmed. In this regard, it can be said that according to the cognitive perspective, irrational cognitions can lead to emotions and dysfunctional behaviors, and this can prevent the use of appropriate methods of problem solving in the person and ultimately endanger his health. However, emotion regulation can be done in effective ways by problem-solving and safe behaviors. Individual health in psychological components such as cognitive capital, an appropriate level of social support, and

appropriate attitude towards death in the elderly causes the regulation of emotions and appropriate decision-making in problems, including health-related problems.

## 5 | CONCLUSION

The data in the present study revealed that psychological capital, social support, and attitudes toward death both directly and indirectly enhance health-promoting behaviors in older adults through the mediation of cognitive emotion regulation strategies. Therefore, although a decisive and final judgment in this regard requires extensive and diverse social and psychological studies, the findings can be a starting point for inducing further research in older adults' health.

Due to the nature of correlation, the present study does not determine the causality of the relationship between variables. Also, due to the cross-sectional nature and the impossibility of random sampling, the generalizability of the results is reduced. On the other hand, it was not possible to research the elderly who did not cooperate with the researchers, so there was a bias in the implementation that the research was done only on volunteer and collaborating samples. It is also not possible to control all unwanted variables. In addition, the large number of questionnaire questions may affect the accuracy and motivation of the elderly. Therefore, it is suggested that the mentioned limiting factors be considered in future studies.

### AUTHOR CONTRIBUTIONS

**Soliman Ahmadboukani:** Data curation; methodology; resources; software; validation. **Davod Fathi:** Data curation; validation. **Sepideh Bashirgonbadi and Mina Karami:** Writing – review and editing. **Abdolbasat Mahmoudpour:** Resources; software; validation. **Behnam Molaei:** Conceptualization; project administration.

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### CONFLICT OF INTEREST

The authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### ETHICS STATEMENT

This study has an ethics code with the ID: IR.ARUMS-REC.1399.018 from Ardabil University of Medical Sciences and ethical considerations have been observed with special sensitivity in the research.



## TRANSPARENCY STATEMENT

The lead author Behnam Molaei affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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## REFERENCES

- Eskelinen K, Hartikainen S, Nykänen I. Is loneliness associated with malnutrition in older people? *Int J Gerontol*. 2016;10(1):43-45.
- Shamsadini Lori A, Pourmohamadi K, Keshtkaran V, Ahmadi kashkoli S, Pourahmadi MR. A Survey on the Level of the Elderly Lifestyle in Shiraz. *J Health Res*. 2015;1(1):75-84.
- Nikkhah M, Heravi-Karimooi M, Rejeh N, Nia HS, Montazeri A. Measuring quality of life in elderly populations: a review of instruments used. *Payesh (Health Monitor)*. 2017;16(3):303-314.
- Kiani A, Dergahi S, Ahmadbookani S, Esmailbeigi MM. The role of attitudes to life in the thwarted belongingness and perceived burdensomeness in Veterans. 2020.
- Barikdar A, Ahmed T, Lasker SP. The situation of the elderly in Bangladesh. *Bangladesh J Bioe*. 2016;7(1):27-36.
- Salimi F, Garmaroudi G, Hosseini SM, Batebi A. Effect of self-care educational program to improving quality of life among elderly referred to health centers in Zanjan. *J Educ Community Health*. 2015;2(2):28-37.
- Rostami M, Ahmadboukani S, Saleh Manijeh H. Big five personality traits and predicting mental health among Iranian older adults. *Gerontol Geriatr Med*. 2022;8:233372142211323.
- Bender A, Ingram R. Connecting attachment style to resilience: contributions of self-care and self-efficacy. *Pers Individ Dif*. 2018;130:18-20.
- Chen J, Zhao H, Hao S, Xie J, Ouyang Y, Zhao S. Motivational interviewing to improve the self-care behaviors for patients with chronic heart failure: a randomized controlled trial. *Int J Nurs Sci*. 2018;5(3):213-217.
- Liu L, Wang X, Cao X, Gu C, Yang C, OuYang Y. Self-care confidence mediates the relationship between type D personality and self-care adherence in Chinese heart failure patients. *Heart Lung*. 2018;47(3):216-221.
- Saleh Manijeh H, Rostami M, Ahmadboukani S. Development of the coronavirus anxiety model in the elderly: based on hope and Health-Related quality of life with the mediating role of perceived social support. *Gerontol Geriatr Med*. 2021;7:233372142110483.
- Macabasco-O'connell A, Crawford MH, Stotts N, Stewart A, Froelicher ES. Self-care behaviors in indigent patients with heart failure. *J Cardiovasc Nurs*. 2008;23(3):223-230.
- Jaroslawa B, Kurylek A, Wozniacka A, Sysa A, Arkuszewska C. Personality traits and demographic an variables influence on quality of life in systemic Sclerosis. *J Psychosom Res*. 2011;30(1):2-16.
- Davies N. Promoting healthy ageing: the importance of lifestyle. *Nurs Stand*. 2011;25(19):43-50.
- Orem DE, Vardiman EM. Orem's nursing theory and positive mental health: practical considerations. *Nurs Sci Q*. 1995;8(4):165-73.
- HEMMATI MM, Hashemlo L. Design and psychometric properties of a self-care questionnaire for the elderly. 2015.
- Luthans F, Luthans KW, Luthans BC. Positive psychological capital: beyond human and social capital. 2004.
- Luthans F, Avolio BJ, Avey JB, Norman SM. Positive psychological capital: measurement and relationship with performance and satisfaction. *Pers Psychol*. 2007;60(3):541-572.
- Luthans F, Norman SM, Avolio BJ, Avey JB. The mediating role of psychological capital in the supportive organizational climate—employee performance relationship. *J Organ Behav*. 2008;29(2):219-238.
- Luthans F, Avey JB, Avolio BJ, Peterson SJ. The development and resulting performance impact of positive psychological capital. *Hum Res Develop Quart*. 2010;21(1):41-67.
- Hodges TD. An experimental study of the impact of psychological capital on performance, engagement, and the contagion effect: The University of Nebraska-Lincoln. 2010.
- Barghi Irani Z, Rajabi M, Nazami M, Bagiyan Koulemarz MJ. The role of lifestyle, psychological capital and self-care behaviors in predicting subjective well-being of diabetic elderly peoples. *Quart J Health Psychol*. 2017;6(23):17-38.
- Casale M, Wild L, Cluver L, Kuo C. Social support as a protective factor for depression among women caring for children in HIV-endemic South Africa. *J Behav Med*. 2015;38(1):17-27.
- Gülaçtı F. The effect of perceived social support on subjective well-being. *Procedia Soc Behav Sci*. 2010;2(2):3844-3849.
- Stacey J, Talbot CV, Coxon A. Self-care and social support in postgraduate study. *Guide Psychol Postgrad*. 2019:129-134.
- Reife I, Duffy S, Grant KE. The impact of social support on adolescent coping in the context of urban poverty. *Cult Diver Eth Mino Psychol*. 2020;26(2):200-214.
- Stapley E, Demkowicz O, Eisenstadt M, Wolpert M, Deighton J. Coping with the stresses of daily life in England: a qualitative study of self-care strategies and social and professional support in early adolescence. *J Early Adolesc*. 2020;40(5):605-632.
- Yang W, Staps T, Hijmans E. Existential crisis and the awareness of dying: the role of meaning and spirituality. *Omega (Westport)*. 2010;61(1):53-69.
- Nielsen K, Skotnicki T. Sociology towards death: Heidegger, time and social theory. *J Class Sociol*. 2019;19(2):111-137.
- Wong PT. Meaning management theory and death acceptance. *Existential and spiritual issues in death attitudes*. Psychology Press; 2007:91-114.
- Neimeyer RA. Death anxiety handbook: Research. *Instrumentation, and application*. Taylor & Francis; 2015.
- Stange KC, Nutting PA, Miller WL, et al. Defining and measuring the patient-centered medical home. *J Gen Intern Med*. 2010;25(6):601-612.
- Azaiza F, Ron P, Shoham M, Gigini I. Death and dying anxiety among elderly arab muslims in Israel. *Death Stud*. 2010;34(4):351-364.
- Sansó N, Galiana L, Oliver A, Pascual A, Sinclair S, Benito E. Palliative care professionals' inner life: exploring the relationships among awareness, self-care, and compassion satisfaction and fatigue, burnout, and coping with death. *J Pain Symptom Manage*. 2015;50(2):200-207.
- Weems CF, Pina AA. The assessment of emotion regulation: improving construct validity in research on psychopathology in youth—an introduction to the special section. *J Psychopathol Behav Assess*. 2010;32(1):1-7.
- Barrett LF, Mesquita B, Ochsner KN, Gross JJ. The experience of emotion. *Annu Rev Psychol*. 2007;58:373-403.
- Peveler RC, Johnston DW. Subjective and cognitive effects of relaxation. *Behav Res Ther*. 1986;24(4):413-419.

38. Scherer KR. Appraisal considered as a process of multilevel sequential checking. *Appr Proc Emot*. 2001;92(120):57.
39. Potthoff S, Garnefski N, Miklósi M, et al. Cognitive emotion regulation and psychopathology across cultures: a comparison between six European countries. *Pers Individ Dif*. 2016;98:218-224.
40. Volandes AE, Brandeis GH, Davis AD, et al. A randomized controlled trial of a goals-of-care video for elderly patients admitted to skilled nursing facilities. *J Palliat Med*. 2012;15(7):805-811.
41. Wei C-N, Harada K, Ueda K, Fukumoto K, Minamoto K, Ueda A. Assessment of health-promoting lifestyle profile in Japanese university students. *Environ Health Prev Med*. 2012;17(3):222-227.
42. Haga SM, Ulleberg P, Slinning K, Kraft P, Steen TB, Staff A. A longitudinal study of postpartum depressive symptoms: multilevel growth curve analyses of emotion regulation strategies, breastfeeding self-efficacy, and social support. *Arch Womens Ment Health*. 2012;15(3):175-184.
43. Kline RB. *Principles and practice of structural equation modeling*. Guilford publications; 2015.
44. Amiri B, Pourreza A, Rahimi Foroushani A, Hosseini SM, Poorolajal J. Suicide and associated risk factors in Hamadan province, west of Iran, in 2008 and 2009. *J Res health Sci*. 2012;12(2):88-92.
45. Walker SN, Sechrist KR, Pender NJ. The health-promoting lifestyle profile: development and psychometric characteristics. *Nurs Res*. 1987;36(2):76-81.
46. Wong PT, Reker GT, Gesser G. Death attitude profile-revised: a multidimensional measure of attitudes toward death. *Death Anx Handbook: Res, Instru App*. 1994;121:121-148.
47. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff KA. Psychometric characteristics of the multidimensional scale of perceived social support. *J Pers Assess*. 1990;55(3-4):610-617.
48. Garnefski N, Kraaij V, Spinhoven P. Negative life events, cognitive emotion regulation and emotional problems. *Pers Individ Dif*. 2001;30(8):1311-1327.
49. Samani S, Sohrabi Shegefti N, Mansori SS. Mediating role of cognitive emotion regulation for parenting style and emotional disturbances. *Psychol Methods and Models*. 2011;1(3):119-133.

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