

Social Cognitive Theory and Healthy Lifestyle Among Elderly :A Cross-Sectional Study

Abstract

Aims: The elderly population, both globally and in Iran, is on the rise. The well-being of the elderly is a crucial aspect of health. This study aimed to examine the impact of social cognitive determinants on the healthy lifestyle of older adults.

Materials & Methods: A cross-sectional study was conducted in 2021, involving 455 elderly individuals in Rasht City, Guilan province. Data on demographic characteristics, lifestyle information, and constructs of the Social Cognitive Theory were collected.

Findings The majority of participants had an average lifestyle. Among the various components, prevention received the highest score for a healthy lifestyle among the elderly, while physical activity received the lowest score. Among the constructs of the social cognitive theory, outcome expectancies had the highest mean score, while self-efficacy had the lowest mean score. The correlation analysis revealed significant and direct relationships between the constructs of the cognitive theory and healthy lifestyle scores among the elderly. The findings from the model demonstrated that awareness, self-regulation, social support, and outcome expectations significantly predict lifestyle behavior.

Conclusion: The findings suggest that the Social Cognitive Theory holds predictive value for understanding the lifestyle of older adults. It is recommended that educational programs on healthy aging prioritize increasing awareness, promoting self-regulation, providing social support, and enhancing outcome expectancies to foster positive lifestyle choices among older individuals.

Keywords Lifestyle Program, Elderly, Social Cognitive Theory

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Introduction

Aging is a natural process that affects all individuals (1). The proportion of elderly people in the world and Iran is steadily increasing, emphasizing the need to prioritize their health and well-being (2,3). Adopting a healthy lifestyle is crucial in maintaining the physical and mental health of the elderly (4). Along with the rise in the elderly population, their health problems have become more prominent. Factors such as physical inactivity, reduced social networks, loss of loved ones, and mental and physical illnesses have made maintaining a healthy lifestyle a significant challenge for many older adults (5,6).

A healthy lifestyle, characterized by behaviors like healthy eating, regular physical activity, stress management, and positive interpersonal relationships, plays a vital role in preventing or delaying disability and improving quality of life among the elderly (7,8). Research conducted in the UK has shown that engaging in health-promoting behaviors can lead to healthy aging and enhanced quality of life for older adults (9,10). A physical activity intervention in Taiwan positively affects the health behaviors of older adults and encourage health-promoting lifestyles. These findings underscore the importance of adopting and promoting healthy behaviors as a key strategy for promoting well-being and maximizing the potential for successful aging in older populations (10).

The effective implementation of theories and models in health education and promotion programs is essential for their success (11). Social Cognitive Theory (SCT) is a well-established theoretical framework that explains the dynamic relationship between behavior and individual, as well as environmental, factors (12). SCT has been widely utilized in the study of physical activity behavior among various populations, including the elderly (13).

Numerous studies have substantiated the effectiveness of Social Cognitive Theory in promoting a healthy lifestyle (14). For instance, a study by Guan and colleagues (15) found that applying SCT principles in an intervention targeting physical activity resulted in significant improvements in exercise behavior among older adults. Similarly, a systematic review conducted by Bagherniya and colleagues (16) revealed that SCT-based interventions were effective in promoting healthy eating behaviors and weight management in older populations. These studies highlight the robust evidence supporting the efficacy of SCT in facilitating behavior change and promoting healthy lifestyles among older adults.

This theory of human motivation and action elucidates the internal and external processes (cognitive, situational, self-reflective, and self-regulatory) that influence psychosocial functioning (17).

By understanding the factors that influence the lifestyle of the elderly, health professionals can design effective educational programs to support active and happy aging (18). The current study aimed to leverage the utility of SCT constructs as a theoretical basis for tailoring lifestyle programs to the elderly population.

By employing SCT as a guiding framework, this study contributes to the development of evidence-based strategies that can empower older adults to adopt and maintain health-promoting behaviors, ultimately leading to enhanced well-being and quality of life.

Materials & Methods

The research was a cross-sectional study conducted in the north of Iran Rasht City among the 60-year of 2021. According to a similar study by Alaei *et al.* (19), the formula $N = z^2 p (1-p)/d^2$ was used, The first type error is 5% and with d equal to 3%, and based on the following formula, the required number of samples was 350 people, which increased to 420 people by considering the effect of the design equal to 1.2. Eventually, the sample size was calculated as 455. The required samples were selected using the stratified sampling method, based on the inclusion/exclusion criteria. The selected elderly were contacted to attend the center to complete the questionnaire. After explaining the research project's objectives and obtaining written consent, one of the project partners read the questionnaire to the elderly and recorded their opinions.

The participants were selected from a total of 38 comprehensive health service centers and bases in Rasht City. The sampling was done using a relative classification method, where in the number of participants selected from each center was proportional to the total number of elderly individuals registered at that center.

The initial selection of participants was done randomly using the Sib system and the household file numbers. Subsequent participants were then selected using a random number table to reach the desired sample size of 455.

The selected elderly participants were contacted and invited to attend a central location to complete the study questionnaire. After explaining the research objectives and obtaining written informed consent, one of the research team members read the questionnaire to the participants and recorded their responses. The data collection was carried out over a period of approximately 55 days, from December to the end of February 2019.

Questionnaires were completed through face-to-face interviews. Before completing the questionnaires, the purpose of the study was explained to the study participants and they were assured that their data would be confidential and used only for research purposes. Written consent was obtained from all study participants. Participants aged 60 years and older, without movement problems, who expressed satisfaction with their participation, were included in the study, while incomplete completion of the questionnaire was considered as an exclusion criterion.

This study was designed as a cross-sectional research project conducted in Rasht City, located in northern Iran, among individuals aged 60 and above in the year 2021. The sample size was calculated based on a similar study by Alaei et al. (19), using the formula $N = z^2 p (1-p) / d^2$. With a 5% first-type error and a 3% margin of error (d), the initial sample size was determined to be 350 participants.

Considering a design effect of 1.2, the sample size was increased to 420 and ultimately calculated as 455 individuals. The required samples were selected using a stratified sampling method, based on established inclusion and exclusion criteria.

The selected elderly participants were contacted and invited to attend a research center to complete the questionnaire. After explaining the study objectives and obtaining written consent, one of the project partners read the questionnaire to the elderly participants and recorded their responses through face-to-face interviews. Participants aged 60 and above, without mobility issues, and who expressed willingness to participate, were included in the study. Incomplete questionnaire completion was considered an exclusion criterion.

Measures The data collection tool in this research consists of three parts; The First part is demographic characteristics (13 questions) including age, height, weight, body mass index, level of education, sex, marital status, number of children, occupation, second job during retirement, total monthly income, history of chronic illness (Respiratory disease, heart disease, blood pressure, blood fat, diabetes), family composition.

The second part of the constructs in social cognitive theory (48 questions) include the construct of awareness (9 questions) with a 3-point Likert scoring system (correct = 2 points, don't know = 1 point, incorrect = 0 points); Self-efficacy construct (6 questions); outcome expectation (8 questions), outcome expectancies (9 questions); Social support (7 questions); Observational learning (3 questions) and self-regulation structure (6 questions) these six structures with a 5-point Likert response score (completely agree = 5 points, agree = 4 points, have no opinion = 3 points, disagree = 2 points, completely disagree = 1 point). Except for the self-efficacy construct, which was taken from Sherer's questionnaire (20). The remaining questions in this section were developed from the researcher's questionnaire and were compiled using similar studies, library research, and the experiences of the research team.

The third part of the healthy lifestyle questionnaire, taken from the 26-question Ishaghi scale for measuring the healthy lifestyle of the elderly, includes 8 prevention questions, 9 nutrition questions, 1 physical activity question, 5 stress management questions, and 3 questions about social and interpersonal relationships... On a 5-point Likert scale for frequency evaluation, score 1 indicates never, score 2 indicates rarely, score 3 indicates sometimes, score 4 indicates often, and score 5 indicates always. The maximum score is 130 and a score between 26 and 76 indicates an unhealthy lifestyle, a score of 101-77 indicates an average lifestyle and a score of 130-102 indicates a healthy lifestyle (18).

The opinions of 10 faculty members (including one epidemiologist, one statistician, one nutritionist, and seven health education and health promotion specialists) were used to calculate the questionnaire ratio. In the questionnaire for the social cognitive theory constructs, the CVR values calculated were 0.78 for consciousness, 1 for self-efficacy, 0.97 for outcome expectation, 0.80 for outcome expectancies, 0.97 for the environment, 0.90 for observational learning, and 1 for self-regulation. The CVI values obtained were 0.96 for consciousness, 1 for self-efficacy (with one

question omitted), 0.90 for outcome expectation (with one question omitted), 0.98 for outcome expectancies, 1 for the environment, 0.78 for observational learning, and 1 for self-regulation. Mean values above 0.8 were also obtained for the reliability coefficient of consciousness (0.77), self-efficacy (0.91), outcome expectation (0.91), outcome expectancies (0.82), environment (0.87), observational learning (0.81), and self-regulation (0.83).

In the healthy lifestyle questionnaire, the Content Validity Ratio (CVR) values were 0.97 for prevention, 0.95 for nutrition, 1 for exercise, 0.88 for stress management, and 1 for social and interpersonal relationships.

The Content Validity Index (CVI) values were calculated as 1 for the prevention domain, 0.90 for the nutrition domain, 0.90 for the exercise domain, 1 for the stress management domain, and 1 for social relations and interpersonal relationships.

Formal validity was assessed in terms of text, grammar, and editing. A pilot study was completed with 30 elderly people living in Rasht to evaluate the questionnaire's reliability.

Statistical Strategy Statistical analysis was performed using R-software v.4.1.2 [The R Foundation for Statistical Computing, Vienna, Austria]. Data analysis was conducted using SPSS software v.22.0. Qualitative variables were expressed as numbers (percentage), while quantitative variables were expressed as mean \pm standard deviation. The Kolmogorov-Smirnov tests were used to evaluate the normality of the data. The Spearman correlation test was used to determine the relationship between the quantitative-studied variables. All analyses were performed two-sided and a significant level was considered at 0.05.

The Shapiro-Wilk tests were used to assess the normal distribution of age and BMI. An Independent T-test was used to compare quantitative variables between groups. The Chi-squared and Fisher's Exact tests were used to examine the relative distribution of patients assigned to different categories of qualitative variables.

Ethics approval and consent to participate in article results from a research project approved by the Ethics Committee of the Deputy Research and Technology Guilan University of Medical Sciences with the ethics code IR.GUMS.REC.1399.434.

Findings

Out of 455 elderly participants in the study, 247 (54.3%) were female. Regarding age composition, 56.7% of the elderly were in the age group of 60-69 years (young-old) and 33.6% were in the age group of 70-79 years (middle-old). 26.4% of the participants had a diploma. 75.4% of the samples were married, and 71.4% had more than two children. 45.5% of the study participants were retired. 47% had a monthly income of more than \$110, and 67.5% of the elderly had at least one chronic disease. 54.5% of the elderly lived with their spouse at the time of answering the questionnaire. In terms of body mass index, 42.0% of the elderly were overweight. The results indicated that the healthy lifestyle score was related to education, job, income, and family composition. Elderly participants who had attained a higher level of education demonstrated higher lifestyle scores. As income increased, so did their lifestyle score. In addition, the elderly who resided with their spouse and family exhibited a higher quality of life score (Table 1).

Table 1) Individual-social characteristics and comparison of the lifestyle score in the elderlies

individual-social characteristics			lifestyle		
		N	%	Mean \pm SD	P-Value
Total		455	100	105.5 \pm 15.7	
age	young-old(60-69)	258	56.7	105.3 \pm 16.3	0.578‡
	middle-old(70-79)	153	33.6	106.4 \pm 14.3	
	very old(80+)	44	9.7	103.1 \pm 16.6	
gender	male	208	45.7	105.9 \pm 16.1	0.490†
	female	247	54.3	105.1 \pm 15.4	
BMI	Normal	156	34.3	105.8 \pm 16.9	0.717‡
	Over Weight	191	42.0	105.4 \pm 15.3	
	Obese	108	23.7	105.2 \pm 14.7	
Education	Illiterate	67	14.7	102.1 \pm 17.0	<0.001‡

	Reading and Writing	39	8.6	100.8±10.2	
	Elementary	89	19.6	105.0±14.9	
	High school	56	12.3	101.9±15.8	
	Diploma	120	26.4	106.6±15.3	
	University	84	18.5	111.5±16.3	
Marital Status	Single	5	1.1	98.6±15.2	0.126‡
	Married	343	75.4	106.0±15.9	
	Divorced	7	1.5	93.1±22.4	
	Widow	100	22.0	104.7±14.2	
No. Child	0	20	4.4	103.9±15.8	0.551‡
	1	25	5.5	107.4±14.2	
	2	85	18.7	106.7±17.3	
	>2	325	71.4	105.1±15.4	
job	Retired	207	45.5	108.1±14.5	0.001‡
	Employee	14	3.1	106.1±16.3	
	Self-employed	30	6.6	97.7±20.1	
	Manual worker	13	2.9	94.2±14.2	
	Unemployed	14	3.1	99.2±15.4	
	Housewife	177	38.9	105.0±15.5	
Income	Under \$60	70	15.4	101.9±17.1	<0.001‡
	Between \$60 and \$110	171	37.6	102.4±15.2	
	More than \$110	214	47.0	109.0±14.9	
Disease background	Yes	307	67.5	104.7±15.4	0.057†
	No	148	32.5	107.1±16.2	
Family composition	single	55	12.1	103.7±15.2	0.043‡
	with wife	248	54.5	106.5±15.7	
	with family	148	32.5	105.2±15.1	
	with relatives	4	.9	77.5±22.0	

† Mann-Whitney Test, ‡ Kruskal-Wallis Test

Based on the findings, most participants (60.9%) were found to have a healthy lifestyle. Among the various components, prevention had the highest balanced score (0-100) for a healthy lifestyle in the elderly, while physical activity had the lowest score.

The results indicated that outcome expectancies had the highest average score at 80.7%, while self-efficacy structure had the lowest average score at 60.2% in the constructs of social cognitive theory. The Table 2 was used to show the correlation between cognitive theory constructs and healthy lifestyle scores in the elderly. The results indicated that all of these relationships were significant and direct. The strongest relationship between healthy lifestyle and cognitive theory constructs was found in the self-regulation construct ($r=0.48$, $P<0.001$), while the weakest was found in the awareness construct ($r=0.21$, $P<0.001$). Additionally, the highest correlation was observed between cognitive theory constructs, specifically between social support and observational learning ($r=0.77$, $P<0.001$), while the lowest correlation was found between awareness and self-efficacy ($r=0.16$, $P=0.001$) (Table 2).

Table 2) Correlation of the bivariate associations between social cognitive theory constructs and healthy lifestyle score

	1	2	3	4	5	6	7	8
Self Regulation ⁸								1.00
Observational Learning ⁷							1.00	0.72*
Social Support ⁶						1.00	0.77*	0.64*
Outcome Expectancies ⁵					1.00	0.57*	0.55*	0.62*
Outcome Expectation ⁴				1.00	0.77*	0.51*	0.48*	0.53*
Self Efficacy ³			1.00	0.41*	0.47*	0.46*	0.47*	0.50*
Awareness ²		1.00	0.16†	0.15†	0.15†	0.17*	0.20*	0.19*
Life Style ¹	1.00*	0.21*	0.36*	0.32*	0.39*	0.46*	0.43*	0.48*

Discussion:

Based on Social Cognitive Theory studies, various constructs have been identified as the strongest predictors of lifestyle-related behaviors in the elderly (20, 24). In our study, the self-efficacy constructs obtained the lowest percentage (68.15%), while the outcome expectation constructs (84.55%) and outcome expectancies (84%) scored the highest. Other researchers have found similarly, outcome expectancies scored the highest, while self-efficacy scored the lowest (25), and also the expectation of the outcome was the construct with the highest score among the constructs of Social Cognitive Theory (23). Additionally, in the study of Ghoreishi *et al.* (25), anticipation, outcome expectancies, and self-regulation were identified as the strongest predictors. However, the findings of our study are inconsistent with those of Amini Moridani *et al.* (26) who found that perceived social support constructs obtained the highest score, while environmental structures scored the lowest. The reason for this difference may be variations in study timing and cultural differences across the studied cities.

Based on Social Cognitive Theory studies, various constructs have been identified as the strongest predictors of lifestyle-related behaviors in the elderly (Uszynski *et al.*, 2018; White *et al.*, 2012). In our study, the self-efficacy constructs obtained the lowest percentage (68.15%), while the outcome expectation constructs (84.55%) and outcome expectancies (84%) scored the highest. Other researchers have found similarly, as outcome expectancies scored the highest, while self-efficacy scored the lowest (Umstatted & Hallam, 2007). Additionally, the expectation of the outcome was the construct with the highest score among the constructs of Social Cognitive Theory (F. Stacey, James, Chapman, & Lubans, 2016). In the study of Ghoreishi *et al.* (Ghoreishi, Vahedian-Shahroodi, Esmaily, & Tehrani, 2018), anticipation, outcome expectancies, and self-regulation were identified as the strongest predictors. However, the findings of our study are inconsistent with those of Amini Moridani *et al.* (Amini Moridani, Tol, Sadeghi, Mohebbi, & Azam, 2015) that found perceived social support constructs obtained the highest score, while environmental structures scored the lowest. The reason for this difference may be variations in study timing and cultural differences across the studied cities.

There was no statistically significant difference between the mean of structures by gender and body mass index based on our study. There was a significant relationship between constructs' outcome expectancies and outcome expectations with a history of chronic disease. The elderly individuals with no history of chronic disease had higher mean structural value scores and expected outcomes. The importance that the elderly people attribute to desired behaviors forms the foundation for health promotion. In contrast, our study's findings contradict those that reported a significant relationship between the history of chronic disease and both self-efficacy and self-regulatory structure (27). This difference may be due to differences in the study subjects. Another significant finding of this study is the relationship between the mean construct of outcome expectancies and the number of children. Elderly people with two children tend to achieve better expected outcomes on average. Unfortunately, no similar article was found regarding these findings. Children can support their parents when they become old, and it is most likely that the elderly who have more children will receive more support compared to those without children.

A significant relationship was observed between the construct of outcome expectancies and social support with family composition. Elderly people living with families have an average outcome expectancies score, and elderly people living with their spouse had a higher social support score because of the increased need for family support. On the other hand, the results of the study oppose those of Heidari *et al.* (27), who observed a statistically considerable association between marital status and self-efficacy. The variation in the findings may be due to discrepancies in the populations examined. So they only focused on women with diabetes referring to diabetes centers.

There is a statistically significant relationship between the mean value constructs and outcome expectation, social support, observational learning, and self-regulation according to education. The average score of these constructs was higher in the elderly who have a university education. With the increase in education, people's awareness increases due to the ability to read different books, and magazines or benefit from scientific websites, which is due to the literacy of the elderly with the

ability to read different books and have life skills. Their worldview is better and more open towards life. These results are consistent with findings from other studies (28-31).

A statistically significant relationship between the mean value structure of the outcome and social support based on occupation has been observed. Among elderly individuals, those employed as employees scored higher in these two constructs compared to their counterparts which is in line with the results of other studies (17, 30). However, in the study conducted by Heydari Suranjani *et al.* (27), a statistically significant relationship between employment status and self-efficacy and self-regulation structures was found, contradicting our findings. This contradiction may be influenced by factors such as the gender and diabetes condition of the participant, as well as the variances in time between the two studies.

There was a statistically significant relationship between the constructs of awareness, outcome expectancies and expectations, social support, observational learning, and self-regulation in terms of income. The average scores of these constructs were higher among the elderly with higher incomes (above \$110). Income and economic status are among the most important determinants of health in people, especially the elderly (10, 28, 31). Therefore, government policies should prioritize providing special financial support through organizations like the Ministry of Welfare and Social Affairs. This support would encourage families who are unable to care for the elderly and ensure that all seniors can enjoy the benefits of living with family.

The findings also showed a direct and positive relationship between the mean scores of awareness, self-efficacy, outcome expectancies, social support, observational learning, self-regulation, and healthy lifestyle scores. In the studies conducted by Khani Jeihooni *et al.* (33) and Ryan (34), a statistically significant relationship was found between nutritional performance, walking, and self-regulation, indicating consistency with the present study. These results suggest that the constructs of awareness, self-efficacy, outcome expectancies, social support, observational learning, and self-regulation from the social cognitive theory play an important role in healthy lifestyle behavior.

According to the results of the present study, of all the variables, including social cognitive theory and demographic variables, 26.3% of healthy lifestyle behavior is predicted by these two categories of variables. The constructs of social support, self-regulation, outcome expectancies, and awareness showed significant predictability using a multivariate linear regression model and step-wise method. They accounted for 25.9% of the variance in lifestyle behavior ($R^2 = 0.259$). According to this model, the included demographic variables were not significant and were removed from the model. Such findings have also been observed in previous studies (35-37), therefore as individuals age and enter old age, the need for environmental support, particularly from family members, increases. In general, social support has a positive impact on the lifestyle of older adults (35).

Regarding the awareness structure, older individuals exhibited a higher level of awareness, knowledge, and information regarding health-promoting behaviors and lifestyles, also known as health literacy. They demonstrated an equal understanding and application of health issues and lifestyle. Moreover, these individuals were perceived more favorably. According to Bandura, self-regulatory strategies are crucial for targeting and planning regular physical activity (38). Self-regulation plays a pivotal role in social cognitive approaches to modifying health behaviors. In our study, elderly participants who practiced self-control and goal setting in shaping their lifestyle behaviors exhibited a more desirable lifestyle. Furthermore, the likelihood of engaging in desired behavior increases with an individual's higher value placed on the expected outcome.

Step-wise multiple regression analyses conducted in the study by Sung and Lim (39) revealed that the social support structure, which had a 55% predictive power, emerged as the strongest predictor for a health-promoting lifestyle. In the study conducted by Peyman *et al.* (40), it was found that self-regulatory structures and social support were the strongest predictors of physical activity in type 2 diabetic women. The results of Liu's study (37) demonstrated that social support structures from friends were the strongest predictors according to the Social Cognitive Theory in students' physical activity. Umstatted and Hallam's study (23) indicated that self-regulation and expectation were the most influential factors in predicting physical activity among adults.

The present study results are inconsistent with the study by Yari *et al.* (35), where self-efficacy was one of the strongest predictors of physical activity. It is also inconsistent with the study of Nematollahi and Eslami (42), in which the constructs of the Social Cognitive Theory of self-regulation had the greatest impact on physical activity, while the construct of self-efficacy had the least impact. The existing discrepancy in this field can be justified by the differences between the geographical area, culture, and climate of the present study.

Linear regression analysis in the study of Abdi *et al.* (43) showed that among the constructs of social structure theory, environment, and self-efficacy were the strongest predictors of a healthy lifestyle in overweight and obese employees. However, the study is inconsistent. This discrepancy may be due to differences in the target groups regarding climatic and occupational conditions of the study subjects. Mahmoodi *et al.*(36) conducted a survey that explained the Social Cognitive Theory constructs (self-efficacy, outcome expectations, outcome expectancies, family support, and friend support) accounting for 13% of the variance of physical activity behavior in Borkhar and Shahin Shahr health network employees in Isfahan. The results of the present study are inconsistent with this study.

Furthermore, in the study of Gothe and Kendall (44), self-efficacy and outcome expectation were identified as the most important predictors of physical activity for African-American adults. The findings of the present study were inconsistent with this study. These differences may be attributed to the heterogeneous population in the mentioned studies, which had different age ranges, demographic characteristics, and cultural and climatic differences that were distinct from the present study. **Limitations:**

Among the limitations of the present study was the collection of information in a self-reporting manner. This method, which relied on participants being honest and accurate in answering questions, was beyond the control of the researcher. Additionally, the study faced challenges due to the large number of questions included in the questionnaire. It is important to note that the data collection coincided with the COVID-19 pandemic, which posed difficulties in ensuring convenient access to all elderly participants during quarantine. These circumstances may have influenced the quality of the data obtained.

Conclusions:

Based on the results of the present study, Social Cognitive Theory is a suitable framework for understanding and promoting healthy lifestyles among the elderly. Factors such as awareness, self-efficacy, self-regulation, social support, outcome expectations, and observational learning were found to be key predictors of healthy lifestyle behaviors in the elderly population. Social support, both from peers and family, emerged as a particularly important factor. The results highlight the importance of targeting these cognitive and social constructs when designing educational interventions to foster healthy lifestyles in the elderly. Further research is needed to explore other potential variables that may influence healthy lifestyle behaviors in this age group.