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The relationship between functional independence and life satisfaction among Iranian community-dwelling older adults during the COVID-19 pandemic: A cross-sectional study

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Abstract

Background: The COVID-19 pandemic has fundamentally changed the lives of older adults. However, the functional independence (FI) and the life satisfaction (LS) of older adults have received less attention.

Objectives: This study aimed to evaluate the relationship between FI and LS in community-dwelling older adults during the COVID-19 pandemic.

Methods: This cross-sectional study was conducted in 2021. Participants were 479 community-dwelling older adults randomly selected from public healthcare centers in southern Tehran, Iran. Data collection instruments were a demographic questionnaire, the activities of daily living (ADL) scale, the Instrumental ADL (IADL) scale, and the Life Satisfaction Index-Z. The Pearson correlation coefficient, independent samples t-test, analysis of variance, and regression analysis were used to analyze the data.

Results: The mean scores of participants' LS, FI in ADL, and FI in IADL were 11.94±5.11 (in the possible range of 0–26), 15±2.32 (in the possible range of 0–16), and 11.28±3.72 (in the possible range of 0–14), respectively. Around 55% of participants had low LS and only 2.5% of them had high LS. LS had a significant correlation with independence in ADL (r=0.133; P=0.004) and IADL (r=0.213; P<0.001). Independence in IADL and income significantly predicted 30% of the variance of LS (P<0.05).

Conclusion: Older adults had optimal levels of FI in ADL and IADL and a low level of LS. Healthcare authorities can improve older adults' LS through strategies to promote their FI; such as formulating health policies, amending health system laws, and establishing insurance coverage to reduce costs.

Keywords: Aging, Functional independence, Life satisfaction.

Introduction

Aging is a natural process with extensive physiological, psychological, and social changes.[1] The population over the age of 65 is expected to double in the next forty years, particularly in developing countries.[2] The aging population in Iran is estimated to increase from 14% in 2011 to 34% by 2050.[3]

Physical and mental disabilities, and chronic diseases make older adults unable to perform daily activities, undermine their authority, reduce their capacity for self-care and self-efficacy, and endanger their functional independence (FI).[4,5]

FI is the ability to perform activities of daily living (ADL) and instrumental ADL (IADL). ADL refers to self-care activities that should be performed during in living, including eating, clothing, bathing, moving, elimination, and walking. IADL also includes activities needed for independent living in society, such as food preparation,

household and outdoor activities, medication taking, payment management, and telephone use. [4] The ability to perform ADL and IADL and maintain FI is so important for older adults that they consider dependence as worse than death.[6] The prevalence of dependence in ADL and IADL among Iranian older adults was reported to be 23.3% and 28.5%, respectively.[7] A study in Iran also showed that the occurrence of traumatic events in older adults has a significant impact on their ADL.[8]

One of the most important factors affecting older adults is infectious diseases, such as the current coronavirus disease 2019 (COVID-19) pandemic. Epidemics can impair normal functioning, cause physical weakness, and compromise mental and social health due to quarantine and physical distancing.[9,10] Moreover, affliction by COVID-19 has significant effects on older adults functioning.[11,12]

A study showed the potential relationship between FI and life satisfaction (LS).[13] LS is an important component of well-being, indicating the degree to which people can effectively cope with various changes and conditions.[14] LS improves positive feelings and motivation for engagement in physical activities. Hence, individuals with higher LS have better functional abilities and use better strategies to deal with problems.[14] LS is also correlated with physical, mental, and social factors,[15] FI, social life, income, education, mental health, and satisfaction with peers.[15,16]

A study reported that improvement in FI through regular physical and leisure activities can improve LS among older adults.[17] A study found that compared with the time spent on ADL and rest, the time spent on leisure and occupational activities was associated with higher levels of LS.[18] Another study reported that older adults without impairment in performing ADL had higher levels of LS.[19] We can suppose that COVID-19 and its consequences may cause functional limitations in older adults and affect their FI and LS, but, contradictory results can be found. For example, a Chinese study showed that the majority of participants reported LS despite prolonged isolation.[20] Despite the importance of FI and LS among older adults, there are limited data about this relationship in this population in Iran. The restrictions caused by the COVID-19 condition, including long-term quarantine and social distancing, affect the lives of older adults. Therefore, the present study was conducted to produce more evidence in this area.

Objectives

This study aimed to evaluate the relationship between FI and LS among older adults during the COVID-19 pandemic.

Methods

Study Design and Participants

This cross-sectional study was conducted in 2021. The study population consisted of all community-dwelling older adults who were referred to the public healthcare centers in southern Tehran, Iran. All these centers are covered by Tehran University of Medical Sciences. Cluster sampling was performed to select the health centers. Each of the five districts in southern Tehran was considered a cluster from which two or three public healthcare centers were randomly selected. An equal number of eligible older adults were then selected from each center through simple random sampling. Eligibility criteria were age 60 years and older, basic literacy skills, dwelling in the community, and no debilitating chronic diseases or cognitive or mental problems (as self-reported by the participants and chart review). The sample size was calculated with a confidence level of 0.95, a power of 0.90, and a LS-FI correlation coefficient of at least 0.15 to be considered statistically significant.[21] The formula for calculating sample size [Formula 1] revealed that at least 479 participants were needed.

$$\frac{\left(Z_{1-\alpha/2}+Z_{1-\beta}\right)^2}{W^2}+3, \quad W=0.5\times\ln[(1+r)/(1-r)]$$

Formula 1. Sample size calculation formula

Data collection instruments

The research questionnaires were completed by the subjects with the help of the researcher in the first meeting. However, due to the conditions of COVID-19, some information was completed over the phone. In the health centers, all the older adults in the region are registered in the Sib system, and some demographic information could be obtained from the Sib system.

Data were collected using a demographic questionnaire, the ADL scale, the IADL scale, and the Life Satisfaction Index-Z. The items of the demographic questionnaire were age, gender, weight, height, marital status, employment status, education level, income, number of children, and medications used.

We used the eight-item ADL scale and the seven-item IADL scale. The items of both scales are scored on a three-point scale as follows: "zero: Dependent", "1: Needs help", and "2: Independent". The total scores for the eight-item ADL and the seven-item IADL scales are respectively 0–16 and 0–14 which are interpreted as follows: scores 0–7 for ADL and 0–6 for IADL: dependent; scores 8–11 for ADL and 7–10 for IADL: needs help; and scores 12–16 for ADL and 11–14 for IADL: independent.[7]

In a previous study in Iran, Cronbach's alpha and the test-retest intraclass correlation coefficient were reported to be 0.80 and 0.76 for the ADL scale and 0.75 and 0.79 for the IADL scale.[22]

The Life Satisfaction Index-Z has five negatively-worded items (i.e., items 3, 6, 10, 11, and 13) and eight positively worded items (i.e., items 1, 2, 4, 5, 7, 8, 19, and 12). Positively worded items are scored "zero: I don't know", "1: Disagree", or "2: Agree" and negatively worded items are scored reversely. Accordingly, the total possible score of the index is 0–26, which is interpreted as follows: 0–12: low LS, 13–21: moderate LS, and 22–26: high LS. A study of older adults in Iran evaluated the psychometric properties of this index and reported that its test-retest intraclass correlation coefficient, Cronbach's alpha, and split-half unequal length Spearman-Brown coefficient were 0.93, 0.79, and 0.79, respectively.[23]

Data analysis

The SPSS software (v. 16.0) was employed (SPSS Inc., Chicago, IL, USA) for data analysis at a significance level of <0.05. Descriptive statistics (frequency, percent, mean, and standard deviation) were used to describe participants' characteristics. The independent sample t-test and analysis of variance were used to compare the mean scores of LS between subgroups of participants. Pearson's correlation coefficient was used to examine the correlation between dependent and independent variables. Multiple linear regression analysis with the Enter method was used to determine the variables associated with LS. All variables with P≤0.2 in univariate analysis were entered into the model as independent variables.

Ethical considerations

This study was performed by observing the Declaration of Helsinki. The Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran, approved this study (code: IR.TUMS.MEDICINE.REC.1399.1118). Participants were provided with information about the study aim and the confidential management of their information and their informed consent was obtained. Due to the pandemic conditions, we tried to implement all health protocols.

Results

A total of 479 older adults participated in this study. Most participants were male (54.1%), married (71.8%), and retired (52%), 44.3% of them had primary education [Table 1].

The mean score of LS was 11.94±5.11 and 54.9% of participants had low LS, while only 2.5% of them had high LS. The mean scores of FI in ADL and IADL were also 15±2.32 and 11.28±3.72 and the level of FI in ADL and IADL was 90.4% and 73.3%, respectively [Table 2].

LS had a significant relationship with education level and income (P≤0.001), FA in ADL had a significant relationship with gender, marital status, and employment status (P<0.001), and FI in IADL had a significant relationship with gender, marital status, employment status, education level, and income (P<0.001) [Table 1]. Moreover, LS had a significant correlation with FI in ADL (r=0.133; P=0.004) and IADL (r=0.213; P<0.001).

Regression analysis revealed that FI in IADL (P=0.013) and income (P<0.001) were significantly associated with LS. Accordingly, each one-point increase in the score of FI in IADL was associated with a 0.241 point increase in the score of LS. Moreover, the LS of participants with insufficient income and those with relatively sufficient income were 5.77 and 3.499 points lower than those with sufficient income, respectively. Independence in instrumental ADL and income significantly predicted 30% of the variance of LS (P<0.05, [Table 3]).

Discussion

Findings revealed a significant positive relationship between ADL and IADL with LS. The majority of participants were independent in ADL and IADL. Studies show that disabilities increase significantly with age.[24] A study in Turkey showed that FI was clearly lower in the age group over 80 than those in the 65-70 age group.[5] A study of 300 older adults in Iran also reported that 55% of them were completely independent in ADL and 90% were relatively independent in IADL.[25] Another study of older adults in rural areas in Iran also reported that they were relatively independent.[26] The high level of independence in the present study is attributable to the fact that the study was conducted during the COVID-19 pandemic and older adults had to perform their ADL and IADL as independently as possible due to the need for quarantine and physical distancing. The results of studies on the effects of the COVID-19 pandemic on older adults' FI are inconsistent. Some studies have shown that quarantine and physical distancing could decrease physical activity and increase dependence among older adults.[27,28] However, a study found no significant difference between the mean scores of FI in ADL and IDAL before and ninety days after affliction by COVID-19 among Indian older adults.[29] These inconsistent results are attributable to differences among studies respecting their participants' characteristics such as age, place of residence, and geographic area, and highlight the importance of further studies in this area.

Table 1. Participants' demographic characteristics and their relationship with life satisfaction and functional independence

Characteristics		n (%) or Mean±SD (Range)	Life satisfaction		Activities of daily living		Instrumental activities of daily living	
			Mean±SD	P value	Mean±SD	P value	Mean±SD	P value
Gender								
	Female	220 (45.9)	12.17 (4.94)	0.372[a]	14.66±2.59	0.004	10.54±4.10	< 0.001
	Male	259 (54.1)	11.75 (5.26)		15.28±2.02		11.91±3.24	
Marital status	Married	344 (71.8)	12.21 (5.02)	0.063[a]	15.42±1.71	<0.001	12.15±2.85	< 0.001
	Single/divorced/widowed	135 (28.2)	11.25 (5.3)		13.91±3.17		9.05±4.65	
Employment status	Retired	249 (52)	12.16 (5.19)	0.55[a]	14.99±2.30	<0.001	11.17±3.81	< 0.001
	Housewife	158 (33)	11.82 (4.84)		14.62±2.71		10.55±4.01	
	Self-employed	72 (15)	11.45 (5.46)		15.86±1.58		13.27±2.28	
Education level	Primary	212 (44.3)	10.66 (4.86)	< 0.001[b]	14.72±2.67	0.058	10.39±4.15	< 0.001
	Guidance school	66 (13.8)	12.1 (4.31)		15.19±2.09		11.43±3.07	
	Diploma	106 (22.1)	12.75 (4.83)		15.01±2.34		11.62±3.66	
	University	95 (19.8)	13.8 (5.75)		15.47±1.34		12.78±2.47	
Income								
	Insufficient	136 (28.4)	9.01 (4.06)	< 0.001[b]	14.72±2.43	0.114	10.94±3.91	0.009
	Relatively sufficient	190 (39.7)	11.33 (4.59)		14.96±2.45		10.92±3.87	
	Sufficient	153 (31.9)	15.31 (4.68)		15.28±2.02		12.04±3.24	
Age (Years)		72.82±7.33 (60–97)	r=–0.039 P=0.394[c]		r=–0.499 P<0.001[c]		r=–0.567 P<0.001[c]	
Body mass index		26.18±3.72 (17.1–45.2)	r=–0.02 P=0.656[c]		r=–0.067 P=0.145[c]		r=–0.045 P=0.328[c]	

[a] The results of the independent-sample t-test, [b] The results of the one-way analysis of variance, [c] The results of Pearson's correlation analysis.

Table 2. The mean scores and levels of life satisfaction and functional independence

Variables		n (%)	Mean±SD (Range)
Activities of daily living			15±2.32 (4–16)
	Dependent	15 (3.1)	
	Needs help	31 (6.5)	
	Independent	433 (90.4)	
Instrumental activities of daily living			11.28±3.72 (0–14)
	Dependent	64 (13.4)	
	Needs help	64 (13.4)	
	Independent	351 (73.2)	
Life satisfaction			11.94±5.11 (1–25)
	Low	263 (54.9)	
	Moderate	204 (42.6)	
	High	12 (2.5)	

Table 3. Results of multiple linear regression analysis for the prediction of life satisfaction based on functional independence and demographic characteristics

Independent variables		Beta		*T*	P value	Confidence interval	R^2
		Non-standardized	Standardized				
Independence in activities of daily living		−0.235	−0.107	−1.579	0.115	−0.528,0.057	0.3
Instrumental independence in activities of daily living		0.241	0.175	2.492	0.013	0.051, 0.431	
Marital status	Married	−0.174	−0.015	−0.355	0.723	−1.136, 0.788	
	Single (Reference)						
Education level	Primary	−1.076	−0.104	−1.853	0.065	−2.216, 0.065	
	Guidance school	−0.030	−0.002	−0.042	0.966	−1.444, 1.383	
	Diploma	−0.123	−0.010	−0.197	0.844	−1.357, 1.110	
	University (Reference)						
Income	Insufficient	−5.776	−0.509	−10.857	0.000	−6.821, −4.730	
	Relatively sufficient	−3.499	−0.335	−7.152	0.000	−4.461, −2.538	
	Sufficient (Reference)						

Our findings also indicated a significant positive relationship between LS and FI in ADL and IADL. Independence is a key factor in the fulfillment of basic needs, and individuals that are more independent have higher LS. Like our findings, a study showed that physical activity was positively associated with LS among Spanish older adults.[30] Some other studies also reported that functional limitations in ADL and IADL reduce social interactions and LS among older adults.[13,31] Contradictorily, a study reported a significant inverse relationship between LS and FA in IADL.[32] Another study also showed that older adults had higher LS compared to their younger counterparts because they were less responsive to negative conditions.[15] This discrepancy might be related to the difference in education level of participants in different studies, because education level is significantly related to LS[33] and FI[34] among older adults. Engaging in most activities needs adequate knowledge and skills, hence, older adults with higher education levels can manage their activities better and thereby, feel higher levels of LS.

Study findings also revealed FI in IADL and income as the significant predictors of LS among older adults. The effect of income on LS was also stronger than that of other variables in the regression model. Consistent with our findings, a study showed that financial status had a significant positive relationship with LS.[35] Other studies also confirmed the role of financial status in LS and quality of life of older adults.[2,32]

One of the most important limitations of this study was the fourth and the fifth waves of the COVID-19 pandemic in Iran during sampling and data collection, so we had to collect some data through telephone contact. Moreover, participants' psychological status during data collection might have affected the results.

Conclusions

Our older adults had optimal levels of FI in ADL and IADL and a low level of LS. FI in ADL and IADL has a significant relationship with LS, while the significant predictors of LS are FI in IADL and income. Healthcare authorities can take steps to promote the FI of older adults and thereby improve their LS, by carrying out interventions such as formulating health policies, amending health system laws, and establishing insurance coverage to reduce costs. Furthermore, by addressing various dimensions of older adults' health, especially during epidemics such as the COVID -19 pandemic, community health nurses can also improve the LS of older adults. Policymakers and health planners should also consider the necessary measures to regularly monitor FI and LS of older adults. It is suggested that similar studies be conducted with more samples, and in other settings and under non-pandemic conditions.

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Competing interests

None.

Abbreviations

functional independence: FI
life satisfaction: LS
activities of daily living: ADL
Instrumental ADL: IADL

Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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Role of the funding source

None.

Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

This study was performed by observing the Declaration of Helsinki. The Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran, approved this study (code: IR.TUMS.MEDICINE.REC.1399.1118). Participants were provided with information about the study aim and the confidential management of their information and their informed consent was obtained. In addition, due to the pandemic conditions, we tried to implement all health protocols.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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