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Home-based supportive and health care services based on functional ability in older adults in Iran

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Abstract:

BACKGROUND: Home-based care is affordable due to population aging, increased chronic disease, and higher hospitalization costs. The objective was to evaluate home-based supportive and health care services provided to older adults and identify possible associations between activities of daily living (ADLs), instrumental ADL (IADLs) classifications, sociodemographic variables, clinical characteristics, and perceived social support among older adults.

MATERIALS AND METHODS: In this cross-sectional study, 700 people aged 60 years and older were selected by stratified cluster sampling. Areas of Tabriz City were selected as clusters, and 55 comprehensive urban health centers were selected as stratifies. Chi-square, Pearson's and Spearman's tests, and multiple linear regression were used for statistical analyses. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS 24.0, SPSS Inc., Chicago, USA). The study instrument included demographic characteristics of older adults and caregivers, health services provided at home, and two valid questionnaires, including the KATZ index of independence in (instrumental) activities of daily living and a multidimensional scale of perceived social support. Scores on scales and demographic variables were collected during telephone interviews. The study lasted from April 25, 2022, to October 30, 2022.

RESULTS: A high level of perceived social support was 56.6%. The study found that 51.3% of participants had family caregivers. Most participants had ADL independence (85.4%), while 22.9% and 24.3% were dependent and needed assistance with IADL, respectively. Women had a lower ADL score and a higher IADL score than men ($P < 0.05$). The obtained results of multiple regression analysis revealed a negative and significant association between unemployment, illiteracy, increasing age, five and more medications, and ADL and IADL dependency ($P < 0.05$).

CONCLUSION: Empowering older adults to reduce dependency, and designing a formal home-based care system is recommended.

Keywords:

Activities of daily living, family caregiver, home care services, regression analysis, social support

Introduction

One of the most social developments of the 21st century is population aging. According to the United Nations, older adults are considered persons aged 60 years or over.^[1] The increasing older population, their growing needs, disabilities, hospital stay costs, and acquired infections are worldwide concerns.^[2] The world's

population aged 60 and over is estimated to increase from 795 million in 2010 to 2 billion by 2050, and 80% of this population will live in low- and middle-income countries.^[3] Iran is no exception to this rule. According to the latest census in 2016, the population aged 60 and over in Iran was more than seven million people (9.3% of the total population), which is estimated to reach 8 million and 849 thousand people (9.6% of the total population) in 2030.^[4]

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One of the essential health policies for older adults in most countries is to achieve the Aging in Place goal, meaning that older people live in their homes until the end of their lives.^[5] Home has several definitions and is generally defined as a place for social activities, exchanging feelings, gaining valuable experiences, and also a place to receive care.^[6] Therefore, home-based long-term care can be the best alternative to transferring institutional and hospital care to a safe environment.^[7] Home-based long-term care contains two different types of services; basic or non-specialist care, which is helpful in activities of daily living (ADLs) and instrumental ADLs (IADLs). Home-based health care is provided by professionals such as educated nurses or health workers and includes nursing and medical services.^[8] IADLs are more complex than ADLs and require more complicated interactions in the environment,^[9] but performing both of these activities is necessary to maintain the person's independence, health, and well-being.^[10] These care services are done by family members or paid caregivers hired by home care institutions.^[11] Despite the emphasis of Iran's religious values on parental care and existing basic laws regarding the importance of home-based care, there is no formal structured system of home care in Iran, and home care centers are inadequate and inappropriate.^[12]

The ability of older adults to perform daily life activities and physical performance is related to socio-demographic characteristics, economic status, poor relations with relatives, and a lack of social contacts, multi-morbidity, and pain.^[13] Another influencing variable on health is perceived social support. All the person's communication with the surrounding environment and other people cannot be considered social support. A person's evaluation and perception of "family," "friends," and "significant other" as a source of support indicates perceived social support.^[14] The association between poor perceived social support and inactivity,^[15] chronic diseases,^[16] ADL, and IADL dependency^[17] has been established.

Tabriz City, one of the metropolises of Iran, according to the latest population and housing census in 2016, has a population of 1.5 million people.^[18] The number of older people aged 60 or over living in Tabriz City was 186,980 on January 19, 2022. A study in Tabriz showed that participants were 69% and 95% independent in IADL and ADL, respectively.^[19] At present, a study that shows who provides home care to older adults and what factors determine dependency in older adults in Tabriz City has not been found. Due to the population aging, it is vital for the planning for comprehensive care design to study provided home care services for those who live at home in a larger sample size.^[20] Hence, this study was conducted to investigate the level of dependency of older

adults in Tabriz City on ADL and IADL, home-based supportive and health care services provided to older adults, the characteristics of the caregivers providing the services, perceived social support from family members, friends, and significant others and influencing factors of disability (ADL and IADL). According to Nagi's conceptual framework for studying disability, interaction between diseases and functional limitations leads to disability.^[21] To unify the assessment of disability level, the World Health Organization's International Classification of Functioning, Disability, and Health (ICF) describes functional disability as a difficulty in executing ADLs and IADLs independently.^[22] These activities are important because even the need for help in doing them makes a person unable to fulfill his social roles properly.^[23]

The research hypothesis can be stated as follows:

There is an association between perceived social support, underlying chronic diseases, and disability (ADL and IADL dependency).

Materials and Methods

Study design and setting

This cross-sectional study was conducted among older people living in the Tabriz metropolis in northwestern Iran.

Study participants and sampling

The population of this study included 700 randomly selected people aged 60 and over using a stratified-cluster sampling method. Areas of Tabriz City were selected as clusters, and 55 comprehensive urban health centers were selected as stratifies. Figure 1 shows the distribution of the 15 selected centers in Tabriz city. The inclusion criteria for this study were age 60 years and older, willingness to participate in the study, and normal cognitive state (Abbreviated Mental Test score (AMT) > seven points). The valid Persian version of the AMT score was used to assess the participants' cognitive status. The

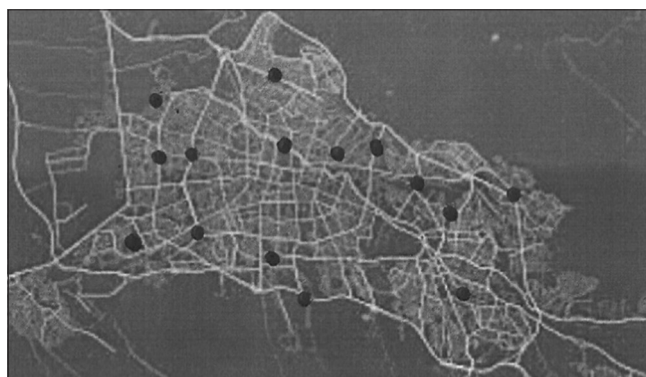


Figure 1: Geographical location of the selected health centers

validity and reliability of the Persian version of the scale have been confirmed in patients with bipolar disorders, with a Cronbach's alpha coefficient of 0.76.^[24,25] The exclusion criteria are as follows: people with cognitive impairment and those who refused participation in the study. The study lasted from April 25, 2022, to October 30, 2022.

Data collection tool and technique

Measurement instrument (home care services for older adults)

The instrument (home care services for older adults) consists of two sections: the first section of the instrument consists of two checklists, one of which includes information about the socio-demographic characteristics of the participants and questions about receiving health-related services at home. Services introduced in previous evidence were used to determine health-related service content.^[26,27] The second checklist includes the characteristics of family and paid caregivers. Questions about the characteristics of caregivers and care features, such as the number of hours of care and the frequency of care, were assessed in this section.

The second section of the instrument includes two questionnaires; the type of supportive service received in terms of ADL and IADL. In designing this part, the valid and reliable Persian KATZ questionnaire was used to determine the status of receiving care in ADL and IADL activities.^[28,29] In the present study, the eight-item version of the ADL index, which is common in many geriatric clinical centers, has been used. ADL items include personal hygiene, eating, dressing, moving, walking, bathing, defecation and urine control, and using the toilet. The IADL questionnaire has different versions with different scores. The version examined in the present study includes seven items (using the telephone, taking medicine, preparing food, doing housework, buying necessities, using vehicles, and controlling income and expenses).^[30]

The second questionnaire was the Multidimensional Scale of Perceived Social Support (MSPSS).^[14] This instrument measures the perceived social support from three sources: family members (items 3, 4, 8, and 11), friends (items 6, 7, 9, and 12), and relatives or significant others (items 1, 2, 5, and 10). Ratings are based on a five-point Likert scale from strongly disagree (Score 1) to very strongly agree (Score 5). The total score corresponds to the sum of the scores of each answered item (0–48), with the higher/lower score indicating higher/lower perceived social support. The MSPSS is a valid and reliable scale internationally^[31] and for Iranian older adults.^[32]

To determine the content and face validity, 16 experts with experience and familiarity with the subject were asked to comment on health-related care, the characteristics of older adults and caregivers, and the content of the whole checklist. The revision was conducted based on the feedback received. After confirming the final instrument, it was used to achieve the purpose of the study.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS 24.0, SPSS Inc., Chicago, USA). Descriptive statistics of the demographic and medical characteristics were conducted with the mean, standard deviation (SD), number (N), and percentage (%) as appropriate. The variables were compared between participants with dependent, needing assistance, and dependent in ADL and IADL, using the Chi-squared test. Pearson's and Spearman's correlations were used to examine correlations among ADL, IADL, and variables of age and number of children, respectively. Also, simple (univariate) and multiple linear regression analyses were utilized to assess the effect of different variables on ADL and IADL by utilizing the total score of ADL and IADL as dependent variables. A *P* value of less than 0.05 was considered as statistical significance.

Ethical considerations

We confirm that this study was carried out in agreement with the guidelines and regulations of the Biomedical Research Ethics Committee at the Tabriz University of Medical Sciences (code number: IR.TBZMED.REC.1400.934). Because of the coronavirus disease 2019 (COVID-19) pandemic, the questionnaire was filled out using a phone; therefore, verbal consent was received from the respondents, and confidentiality of the participants' information was considered.

Results

Baseline demographic characteristics of older adults and provided home health care services

Among 700 people aged 60 and older, there were 356 females (50.8) and 344 males (49.2). The average age of the population was (71.92 ± 8.03) years old. The majority of participants had an elementary educational level (33.4%). Most of them (36.7%) used their pensions to make a living. Approximately 52.1% of them had a medical history of chronic conditions. In addition, 54.0% of the subjects received less than five medications.

Among home health care services, taking vital signs was not done in most of the participants (62.3). In the same way, most other care was not done at home. Most participants reported high perceived social support scores (56.6%). The socio-demographic and clinical characteristics of the study population are shown in Table 1.

Table 1: Characteristics of the participants

Variables		Variables	
Age, (MD±SD)	71.92±8/03	Musculoskeletal (%)	Yes (20.0) No (80.0)
Sex (%)	Woman (50.85) Man (49.15)	Number of medications (%)	Five and more (21.9) No (24.1)
Married status (%)	Married (71.6) Single (1.0) Dead wife, widow, divorce (27.4)	Home Health Care Services	
Insurance (%)	Yes (81.0) No (19.0)	Taking vital signs (%)	Not done (62.3) Done independently (16.9) Done by another one (19.1) Done with help (1.7)
Living arrangements (%)	Alone (15.9) With wife/husband (55.7) With wife and children (14.9) With children (12.9) With other tribes (0.7)	Medication management (%)	Not done (56.9) Done independently (24.6) Done by another one (14.9) Done with help (3.7)
Level of education (%)	Illiterate (32.7) Elementary school (33.4) Middle, high school and diploma (26.0) University education (7.9)	Injection (medicine) (%)	Not done (91.1) Done independently (6.7) Done by another one (2.0) Done with help (0.1)
Job (%)	Housewife (40.9) Employed (18.4) Unemployed (12.6) Retired (28.1)	Setting up and using medical equipment such as oxygen capsules, glucometers, etc., (%)	Not done (71.7) Done independently (11.4) Done by another one (16.0) Done with help (0.9)
Source of income (%)	Him/his self (17/0) Property income (3/7) Pension (36/7) Property of husband/wife (27/0) Charity organizations (2/1) Receiving financial assistance from other people (10.0) A combination of methods (8.7)	Dietary management (%)	Not done (89.0) Done independently (1.3) Done by another one (8.3) Done with help (1.4)
The amount of income compared to expenses (%)	Lower (46.1) Equal (49.7) Higher (4.1)	Wound care (%)	Not done (99.4) Done by another one (0.6)
Hypertension (%)	Yes (52.1) No (47.9)	Physiotherapy (%)	Not done (99.1) Done by another one (0.7) Done with help (0.2)
Hyperlipidemia (%)	Yes (16.9) No (83.1)	Occupational therapy (%)	Not done (97.1) Done by another one (2.2) Done with help (0.7)
Diabetes (%)	Yes (22.4) No (77.6)	Pain management (%)	Not done (98.0) Done independently (0.3) Done by another one (1.3) Done with help (0.4)
Cardiovascular (%)	Yes (33.1) No (66.9)	Enteral feeding (%)	Not done (99.7) Done (0.1)
Pulmonary (%)	Yes (6.6) No (93.4)	Parenteral nutrition (%)	Not done (99.9) Done (19.1)
Gastrointestinal (%)	Yes (14.0) No (86.0)	Home health care services (%)	Done (53.0) Not done (47.0)
Psychiat	Yes (9.4) No (90.6)	Total score of perceived social support (%)	Low; 12–19 (1.3) Moderate; 20–40 (42.1) High; above 40 (56.6)

The ability of the studied older people to perform ADL and IADL

More participants reported being dependent on another person in any IADLs (22.9%) than in ADLs (8.9%). In addition, 20.3% needed assistance with any of the ADL/IADLs. The highest and lowest dependency were reported for bathing (10%) and feeding (5.7%) in

the ADL classification, respectively. In IADL, the most independence is in managing medication (12%), and the least is in managing finances (16.3%).

Baseline demographic characteristics of caregivers

Table 2 shows that 51.3% of the participants had a family caregiver; most of them were older adults’

Table 2: Characteristics of family and paid caregivers

Variables	First family caregiver	Second family caregiver	Paid caregiver
Sex (%)			
Woman	40.0	8.4	2.4
Man	11.3	4.4	1.0
Relationship with the older adult (%)			
Spouse	12.0	1.3	0.0
Husband	2.7	0.4	0.0
Daughter	23.7	5.0	0.0
Son	8.3	4.0	0.0
Daughter-in-law	0.9	1.4	0.0
Other acquaintances	2.9	0.6	0.0
Age (%)			
Under 20 years	0.4	0.1	0.0
20–39	12.4	3.4	1.9
40–59	25.1	7.4	1.4
Over 60 years old	13.3	1.9	0.1
Married status			
Married	43.3	11.4	2.4
Single	8.0	1.4	1.0
Number of care hours (%)			
<8 h	26.7	8.4	3.0
8–15 h	6.7	2.6	0.4
16–24 h	18.0	1.9	0.0
Frequency of care (%)			
Continuous-daily	39.6	7.1	1.3
Intermittent	11.6	5.8	2.1
Job (%)			
Unemployed	1.4	0.1	0.0
Housewife	30.4	5.6	0.9
Employed	2.7	1.4	0.0
Freelance job	11.4	4.7	1.0
Retired	5.4	1.0	0.1
Nurse	0.0	0.0	1.4
Level of education (%)			
Illiterate	3.7	0.6	0.3
Elementary school	9.4	2.3	0.9
Middle school, high school, and diploma	29.7	7.2	0.8
University education	8.5	2.7	1.4

daughters (23.7%), and their ages were between 40 and 59 years (25.1%). Among them, 43.3% were married, and 30.4% were homemakers. The results reveal that 12.9% of the participants had a second family caregiver and 1.1% had a third caregiver, whose characteristics are shown in the table. Also, the results of this study show that 3.4% of the older adults received care from a paid caregiver, and 1.4% of them were nurses and had a university education. Moreover, the duration of care provided by paid caregivers was less than 8 hours per day (3.0%).

Perceived social support score

The overall mean perceived social support scores from family, significant other, and friends were 15.56 ± 3.92 , 15.28 ± 3.80 , and 11.55 ± 3.07 , respectively. This result shows that the family was the main source of support for the studied older adults. Also, our analysis shows

that 1.3% of older adults reported a low perceived social support score,^[12–19] 42.1% reported an average score,^[20–40] and 56.6% reported a high perceived social support score (above 40).

The relationship between the distribution of people in the ADL and IADL groups and different variables

The findings of the study showed that the ADL of older adults with the variables of sex, married status, having or not having insurance, living arrangements, level of education, job, source of income, the amount of income compared to expenses, hypertension diseases, hyperlipidemia and musculoskeletal, number of medications, and types of home health care services (except enteral feeding and parenteral nutrition) had a significant relationship. However,

IADL with the variables of sex, married status, living arrangements, level of education, job, source of income, the amount of income compared to expenses, underlying diseases other than diabetes, number of medications,

types of home health care services (except for enteral feeding and parenteral nutrition), and total score of perceived social support have a statistically significant relationship [Table 3].

Table 3: Relationship between the distribution of people in ADL and IADL groups and different variables

Variables	ADL classification			P	IADL classification			P
	Dependent (9%)	Needs assistance (5.6%)	Independent (85.4%)		Dependent (22.9%)	Needs assistance (24.3%)	Independent (52.9%)	
Sex, (%)								
Woman	68.3	64.1	48.1	0.002	63.7	34.9	52.4	<0.001
Man	31.7	35.9	51.9		36.3	65.1	47.6	
Married status (%)								
Married	28.6	46.2	46.2	<0.001	40.6	79.4	81.4	<0.001
Single	0.6	1.2	46.2		0.6	1.2	1.1	
Dead wife, widow	71.4	53.8	21.1		58.8	19.4	17.6	
Insurance (%)								
Yes	73.0	66.7	82.7	0.011	78.1	85.2	80.3	0.237
No	27.0	33.3	17.3		21.9	14.8	19.7	
Living arrangements (%)								
Alone	28.6	28.2	13.7	<0.001	23.1	13.5	13.8	<0.001
With wife/husband	14.3	28.2	61.9		25.0	61.2	66.5	
With wife and children	11.1	15.4	15.2		14.4	17.6	13.8	
With children	44.4	25.6	8.7		36.3	7.1	5.4	
With other tribes	1.6	2.6	0.5		1.3	0.6	0.5	
Level of education (%)								
Illiterate	69.8	56.4	27.3	<0.001	56.9	22.9	26.8	<0.001
Elementary school	19.0	35.9	34.8		30.6	38.8	32.2	
Middle school, high school, and diploma	7.9	7.7	29.1		10.6	36.5	32.4	
University education	3.2	0.0	8.9		1.9	11.8	8.6	
Job (%)								
Housewife	46.0	41.0	40.3	<0.001	49.4	25.9	44.1	<0.001
Employed	0.0	0.0	21.5		1.9	21.1	24.3	
Unemployed	34.9	38.5	8.5		28.7	19.4	2.4	
Retired	19.0	20.5	29.6		20.0	33.5	29.2	
Hypertension (%)								
Yes	71.4	71.8	48.8	<0.001	76.3	62.9	36.8	<0.001
No	28.6	28.2	51.2		23.8	37.1	63.2	
Hyperlipidemia (%)								
Yes	31.7	20.5	15.1	0.003	24.4	20.6	11.9	0.001
No	68.3	79.5	84.9		75.6	79.4	88.1	
Diabetes (%)								
Yes	17.5	20.5	23.1	0.57	26.3	23.5	20.3	0.291
No	82.5	79.5	76.9		73.8	76.5	79.7	
Cardiovascular (%)								
Yes	39.7	51.3	31.3	0.19	46.9	44.7	21.9	<0.001
No	60.3	48.7	68.7		53.1	55.3	78.1	
No	38.1	33.3	87.5		57.5	74.1	92.4	
Number of medications (%)								
Less than five	55.6	48.7	54.2	<0.001	55.0	62.9	49.5	<0.001
Five and more	44.4	51.3	17.6		44.4	25.3	10.5	
No	0.0	0.0	28.3		0.6	11.8	40.0	
Total score of perceived social support (%)								
12–19	0.0	5.1	1.2	0.28	1.3	0.0	1.9	<0.001
20–40	57.1	43.6	40.5		51.9	25.9	45.4	
Above 40	42.9	51.3	58.4		46.9	74.1	52.7	

Correlation analysis among ADL and IADL and variables of age and number of children

Pearson correlation analysis was performed to analyze the association between age and functional ability (ADL and IADL). The results showed that ADL and IADL were negatively correlated with age ($P < 0.05$), indicating that participants with more dependency levels in the ADL and IADL were older. According to skewness and kurtosis and the Kolmogorov-Smirnov test, data on the number of children was not normally distributed. Therefore, we used Spearman's test. The results of Spearman's analysis also showed that older people who have more children have lower total ADL and IADL scores (both $P < 0.05$) [Table 4].

Factors associated with ADL and IADL scores from the regression model

Results of the univariate analysis of variance indicated a statistically significant association ($P < 0.05$) between functional disability in ADL and age, married status, level of education, living arrangements, job, presence of chronic disease (except diabetes), number, and type of medication. According to the multiple regression results, some factors, including unemployment, illiteracy, increasing age, and a great number of medications (five and more), led to a low ADL and IADL score ($P < 0.05$). Women had a lower ADL score and a higher IADL score than men ($P < 0.05$) [Table 5].

Discussion

This study aimed to evaluate the home care services provided to older adults, the characteristics of caregivers, and the factors affecting ADL and IADL in the town of Tabriz.

The results show that over half of the participants are illiterate or have completed elementary school. This finding is consistent with the results of the 2015 Iranian census, which revealed that more than half of Iranian seniors (about 54%) are illiterate.^[33,34] Increasing literacy is related to health promotion literacy, which can lead to self-care, healthy aging, and reduced dependency.^[35]

The most common chronic diseases among participants were hypertension and cardiovascular disease,

Table 4: Correlation among ADL and IADL and variables of age and number of children

Variables	Total score of ADL	Total score of IADL
Age		
Pearson correlation	-0.527	-0.594
<i>P</i>	<0.001	<0.001
Number of children		
Spearman's rho	-0.228	-0.499
<i>P</i>	<0.001	<0.001

respectively, in line with national statistics and calls for lifestyle reforms and prevention policies.^[36]

The results of this study showed that 9% of the participants and 22.9% of them had a disability to perform ADL and IADL, respectively. In similar studies in Iran, the dependency on IADL was higher than on ADL, which can be linked to the high illiteracy rate among Iranian older adults.^[33,34]

Similar to another study conducted in Jahrom City, most participants had a high level of perceived social support.^[37] Iran's dominant religious culture seems to create strong solidarity between family members and support for older parents.^[38]

Of all study participants, 51.3% had a primary caregiver among their family members, mostly older adult girls (23.7%). A similar European study also reported that 33.4% of the caregivers were family members, and most of the caregivers were female, married, with secondary education, and between the ages of 40–59 years, which is consistent with the results of the present study.^[39] Only 3.4% of seniors received care from paid caregivers, 1.4% of whom were also nurses and came home for nursing care. While in developed countries, the long-term care system has made it necessary for municipalities to hire a home care provider.^[40,41] Results from this study indicated that most health services were not provided at home. Taking vital signs, managing medications, and setting up and using medical equipment such as oxygen capsules, glucometers, etc., were the most common services provided at home, either by older adults themselves or with the help of another person. These results can be because the home health care system is not developed in Iran and most older adults get health services from the hospital. In Iran, care is delivered at three levels in health centers, and if necessary, referrals are made to the hospital for further treatment and care.^[42] There is no comprehensive home care plan specific to older adults. Informal caregivers predominantly provide long-term care and formal specialized and non-specialized services are not available.^[43] However, with the increase in the number of literate older adults in the future, their access to technology can be an influential factor that will reduce family social support.^[44] Therefore, designing a formal care system in the future with trained caregivers seems necessary.

Consistent with earlier studies,^[45,46] there was a difference between women and men in dependency on IADL; women had more IADL limitations than men. Also, an association between living arrangements and dependency was observed, which meant that the older adults who lived with their children were more

Table 5: Factors associated with ADL and IADL scores from regression model

Characteristics	Univariate regression (ADL)		Multiple regression (ADL)		Univariate regression (IADL)		Multiple regression (IADL)	
	Regression coefficient	P	Regression coefficient	P	Regression coefficient	P	Regression coefficient	P
Age	-0.276	<0.001	-.214	<0.001	-.344	<0.001	-.206	<0.001
Sex								
Woman	-1.074	0.001	-.553	0.231	-.587	0.096	1.176	0.009
Man (ref.)	-	-	-	-	-	-	-	-
Married status								
Married	3.187	0.000	-.423	0.615	3.865	<0.01	0.096	0.906
Single	4.203	0.006	2.710	0.084	3.728	0.025	1.541	0.312
Dead wife, widow, divorce (ref.)	-	-	-	-	-	-	-	-
Living arrangements (%)								
Alone	1.699	0.001	2.941	0.076	1.539	0.422	2.712	0.092
With wife	3.856	0.007	3.068	0.079	3.828	0.043	2.156	0.204
With wife and children	2.860	0.004	3.007	0.089	2.512	0.191	1.974	0.251
With children	-.956	0.000	0.792	0.634	-2.356	0.221	-.779	0.630
With other tribes (ref.)	-	-	-	-	-	-	-	-
Level of education (%)								
Illiterate	-3.060	0.000	-1.694	0.004	-3.439	0.000	-1.841	0.001
Elementary school	-.786	0.194	-.156	0.778	-1.637	0.014	-.613	0.254
Middle school, high school, and diploma	-.132	0.831	-.164	0.756	0.110	0.872	0.248	0.629
University education (ref.)	-	-	-	-	-	-	-	-
Job (%)								
Housewife	-.810	0.029	0.154	0.768	-.842	0.036	-1.134	0.025
Employed	1.141	0.028	-.043	0.927	1.649	0.004	0.218	0.636
Unemployed	-3.784	0.000	-1.889	<0.001	-4.643	0.000	-2.562	0.000
Retired (ref.)	-	-	-	-	-	-	-	-
Hypertension (%)								
Yes	-1.287	<0.001	0.453	0.169	-3.098	<0.001	-.413	0.197
No (ref.)	-	-	-	-	-	-	-	-
Hyperlipidemia (%)								
Yes	-1.255	0.003	0.130	0.719	-2.042	<0.001	0.080	0.820
No (ref.)	-	-	-	-	-	-	-	-
Cardiovascular								
Yes	-.921	0.006	0.600	0.061	-2.393	<0.001	-.045	0.885
No (ref.)	-	-	-	-	-	-	-	-
Number of medications								
Less than five	-1.795	<0.001	-.604	0.127	-3.730	<0.001	-1.769	0.000
Five and more	-3.895	<0.001	-2.020	<0.001	-6.341	<0.001	-3.218	0.000
No (ref.)	-	-	-	-	-	-	-	-
Total score of perceived social support								
12–19	-.121	0.932	0.301	0.792	1.338	0.393	1.342	0.228
20–40	-.790	0.015	-0.050	0.852	-0.602	0.092	0.096	0.713
Above 40 (ref.)	-	-	-	-	-	-	-	-

dependent on their activities. The children had to live with their parents due to functional disabilities.^[47] Consistent with our findings, in other studies, ADL and IADL dependency increased with age.^[48–50] Old age is associated with an increase in chronic diseases and a decrease in physical function, which affects the ability to do daily activities.^[51] ADL and IADL impairment were also associated with medication consumption ($P < 0.001$). A study in Turkey showed that a higher number of medications was more prevalent

in patients with ADL dependency.^[52] Similar to our findings, a study showed that participants with high social support had more independence in ADL and IADL.^[53] Also, like other studies, our study showed a significant association between the distribution of older adults with different education levels in the three groups of ADL and IADL activities.^[54,55] Also, regression analysis showed a significant negative association between unemployment and impairment in ADL and IADL, which is in line with another similar study.^[17]

Limitation and recommendation

This is the first study that assesses health-related services provided at home in Iran. It is also one of the few studies that examines factors affecting the functional ability of Iranian older adults. Previous studies were conducted with a limited geographical scope. In contrast, this study was conducted with a larger sample size and using a more accurate sampling method to cover all the geographical areas of Tabriz City. Since this study was conducted during the COVID-19 pandemic and checklist questions were asked to the participants by phone, there is possibly subjective bias due to self-reporting.

Conclusion

More than a quarter of the older adults are illiterate. Iranian elderly experience chronic diseases and disability for IADL. Unemployment, illiteracy, increasing age, and a great number of medications (five and more) can result in ADL and IADL dependency in old age. The government and health system should be involved and ensure that early diagnosis of chronic diseases, empowerment in self-care, and intervening to avoid polypharmacy are started at earlier ages to prevent future problems. Also, according to the results of this study, health-related services are not provided in homes, so this study provides a clear picture for policymakers to better plan preventive measures for chronic conditions and prepare a practical plan for home care.

Abbreviations

IADL: (instrumental) activities of daily living; MSPSS: Multidimensional Scale of Perceived Social Support; AMT: Abbreviated Mental Test score.

Consent to participate

All of the participants were informed about the aim of the study. Moreover, they were informed that participation in the study is voluntary. Finally, verbal informed consent was obtained from study participants and/or their legal guardian(s) before the start of data collection. All information was treated confidentially. One of the authors (KHM) who filled out the questionnaires after reading the Persian format of the informed consent form obtained their consent and included the study. The invitation to participate in the study included information about data processing and stated that participation was voluntary and that the information of the participants remains confidential.

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Conflicts of interest

There are no conflicts of interest.

References

1. Lutz, Wolfgang, Warren Sanderson, and Sergei Scherbov. "The end of world population growth." *Nature* 2001;412 (6846): 543-545.
2. Landers S, Madigan E, Leff B, Rosati RJ, McCann BA, Hornbake R, et al. The future of home health care: A strategic framework for optimizing value. *Home Health Care Manag Pract* 2016;28:262-78.
3. Balachandran A, de Beer J, James K, van Wissen L, Janssen F. Comparison of population aging in Europe and Asia using a time-consistent and comparative aging measure. *J Aging Health* 2020;32:340-51.
4. Mehri N, Messkoub M, Kunkel S. Trends, determinants and the implications of population aging in Iran. *Ageing Int* 2020;45:327-43.
5. Jaschinski C, Allouch SB, Peters O, Cachucho R, Van Dijk JA. Acceptance of technologies for aging in place: A conceptual model. *J Med Internet Res* 2021;23:e22613.
6. Gillsjö C, Schwartz-Barcott D. A concept analysis of home and its meaning in the lives of three older adults. *Int J Older People Nurs* 2011;6:4-12.
7. Carlson E, Bengtsson M. The uniqueness of elderly care: Registered nurses' experience as preceptors during clinical practice in nursing homes and home-based care. *Nurse Educ Today* 2014;34:569-73.
8. Swedberg L, Chiriach EH, Törnkvist L, Hylander I. From risky to safer home care: Health care assistants striving to overcome a lack of training, supervision, and support. *Int J Qual Stud Health Well-being* 2013;8:20758. doi: 10.3402/qhw.v8i0.20758.
9. Painter P, Stewart AL, Carey S. Physical functioning: Definitions, measurement, and expectations. *Adv Ren Replace Ther* 1999;6:110-23.
10. Wang DX, Yao J, Zirek Y, Reijnierse EM, Maier AB. Muscle mass, strength, and physical performance predicting activities of daily living: A meta-analysis. *J Cachexia, Sarcopenia Muscle* 2020;11:3-25.
11. Diniz MAA, Melo BRdS, Neri KH, Casemiro FG, Figueiredo LC, Gaioli CCLdO, et al. Comparative study between formal and informal caregivers of older adults. *Cien Saude Colet* 2018;23:3789-98.
12. Nikbakht-Nasrabadi A, Shabany-Hamedan M. Providing healthcare services at home-a necessity in Iran: A narrative review article. *Iran J Public Health* 2016;45:867-74.
13. Ćwirlej-Sozańska A, Wiśniowska-Szurlej A, Wilmowska-Pietruszyńska A, Sozański B. Determinants of ADL and IADL disability in older adults in southeastern Poland. *BMC Geriatr* 2019;19:1-13.
14. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. *J Pers Assess* 1988;52:30-41.
15. Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D. Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspect Psychol Sci* 2015;10:227-37.
16. Valtorta NK, Kanaan M, Gilbody S, Ronzi S, Hanratty B. Loneliness and social isolation as risk factors for coronary heart disease and stroke: Systematic review and meta-analysis of longitudinal observational studies. *Heart* 2016;102:1009-16.
17. Mahmud MA, Hazrin M, Muhammad EN, Mohd Hisyam MF, Awaludin SM, Abdul Razak MA, et al. Social support among older adults in Malaysia. *Geriatr Gerontol Int* 2020;20:63-7.
18. Soleimani A. Identification and analysis of elements affecting the development of creative cities in Iranian metropolises (case study: Tabriz metropolis). *Phys Soc Plan* 2021;8:99-110.
19. Laleh P, Bahram P. The survey of the relationship between quality of life of elderly with depression and physical activity in Tabriz, Iran. *Sci J Rehabil Med* 2013;2:39-46.

20. Christensen K, Doblhammer G, Rau R, Vaupel JW. Ageing populations: The challenges ahead. *Lancet* 2009;374:1196-208.
21. Nagi SZ. Some conceptual issues in disability and rehabilitation. In: Sussman MB, editor. *Sociology and rehabilitation*. Washington (DC): Sociol Rehabil 1965:100-113.
22. Rosenbaum P, Stewart D. The World Health Organization international classification of functioning, disability, and health: A model to guide clinical thinking, practice and research in the field of cerebral palsy. *Semin Pediatr Neurol* 2004;11:5-10.
23. Spector WD, Fleishman JA. Combining activities of daily living with instrumental activities of daily living to measure functional disability. *J Gerontol B Psychol Soc Sci* 1998;53:S46-57.
24. Bakhtiyari F, Foroughan M, Fakhrzadeh H, Nazari N, Najafi B, Alizadeh M, et al. Validation of the Persian version of Abbreviated Mental Test (AMT) in elderly residents of Kahrizak charity foundation. *Iran J Diabetes Metab* 2014;13:487-94.
25. Piotrowicz K, Romanik W, Skalska A, Gryglewska B, Szczerbińska K, Derejczyk J, et al. The comparison of the 1972 Hodkinson's abbreviated mental test score (AMTS) and its variants in screening for cognitive impairment. *Aging Clin Exp Res* 2019;31:561-6.
26. Fuhrman MP. Home care for the elderly. *Nutrition Clin Pract* 2009;24:196-205.
27. Reinhard SC, Given B, Petlick NH, Bemis A. Supporting family caregivers in providing care. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Agency for Health Care and Quality (US) 2008.
28. Katz S, Akpom CA. A measure of primary sociobiological functions. *Int J Health Serv* 1976;6:493-508.
29. Gardashkhani S, Ajri-Khameslou M, Heidarzadeh M, Rajaei Sedigh S. Psychometric properties of the healthy aging brain care monitor self-report tool in patients discharged from the intensive care unit. *Int J Nurs Knowl* 2023;13:35-41.
30. Taheri Tanjani P, Azadbakht M. Psychometric properties of the Persian version of the activities of daily living scale and instrumental activities of daily living scale in elderly. *J Mazandaran Univ Med Sci* 2016;25:103-12.
31. Prezza M, Giuseppina Pacilli M. Perceived social support from significant others, family and friends and several sociodemographic characteristics. *J Community Appl Soc Psychol* 2002;12:422-9.
32. Poordad S, Momeni K. Death anxiety and its relationship with social support and gratitude in older adults. *Iran J Ageing* 2019;14:26-39.
33. Hosseini S, Zabihi A, JafarianAmiri S, Bijani A. The relationship between chronic diseases and disability in daily activities and instrumental activities of daily living in the elderly. *J Babol Univ Med Sci*. 2018;20:23-9.
34. Mohamadzadeh M, Rashedi V, Hashemi M, Borhaninejad V. Relationship between activities of daily living and depression in older adults. *Iran J Ageing* 2020;15:200-11.
35. Goharinezhad S, Maleki M, Baradaran HR, Ravaghi H. Futures of elderly care in Iran: A protocol with scenario approach. *Med J Islam Repub Iran* 2016;30:416.
36. Eghbali M, Khosravi A, Feizi A, Mansouri A, Mahaki B, Sarrafzadegan N. Prevalence, awareness, treatment, control, and risk factors of hypertension among adults: A cross-sectional study in Iran. *Epidemiol Health* 2018;40:e2018020. doi: 10.4178/epih.e2018020.
37. Hosseini FS, Sharifi N, Jamali S. Correlation anxiety, stress, and depression with perceived social support among the elderly: A cross-sectional study in Iran. *Ageing Int* 2021;46:108-14.
38. Firoozeh MD, Haliza M, Heidarali A, Shamsuddin A, Latiffah L. How Iranian families response to the conditions affecting elderly primary health care. *Res J Biol Sci* 2010;5:420-9.
39. Verbakel E. How to understand informal caregiving patterns in Europe? The role of formal long-term care provisions and family care norms. *Scand J Public Health* 2018;46:436-47.
40. Davey A, Femia EE, Zarit SH, Shea DG, Sundström G, Berg S, et al. Life on the edge: Patterns of formal and informal help to older adults in the United States and Sweden. *J Gerontol B Psychol Soc Sci* 2005;60:S281-8.
41. Kingston A, Comas-Herrera A, Jagger C. Forecasting the care needs of the older population in England over the next 20 years: Estimates from the Population Ageing and Care Simulation (PACSim) modelling study. *Lancet Public Health* 2018;3:e447-55.
42. Baygi MZ, Seyedin H, Salehi M, Sirizi MJ. Structural and contextual dimensions of Iranian primary health care system at local level. *Iran Red Crescent Med J* 2015;17:e17222.
43. Amini R, Chee KH, Sen K, Ingman SR. Elder care in Iran: A case with a unique demographic profile. *J Aging Soc Policy* 2021;33:611-25.
44. Teerawichitchainan B, Knodel J. Data Mapping on Ageing in Asia and the Pacific. Analytical Report. Chiang Mai: HelpAge International; 2015. Available from: https://www.researchgate.net/profile/Bussarawan_Teerawichitchainan/publication/276204522_Data_mapping_on_ageing_in_Asia_and_the_Pacific/links/5552195b08ae980ca606a8a7.pdf Accessed April 2, 2024.
45. Scheel-Hincke LL, Möller S, Lindahl-Jacobsen R, Jeune B, Ahrenfeldt LJ. Cross-national comparison of sex differences in ADL and IADL in Europe: Findings from SHARE. *Eur J Ageing* 2020;17:69-79.
46. Wheaton FV, Crimmins EM. Female disability disadvantage: A global perspective on sex differences in physical function and disability. *Ageing Soci* 2016;36:1136-56.
47. Wang H, Chen K, Pan Y, Jing F, Liu H. Associations and impact factors between living arrangements and functional disability among older Chinese adults. *PLoS One* 2013;8:e53879.
48. Qi S, Wang Z, Wang L, Wang H, Zhang H, Li Z. Incidence of activities of daily living disability and related factors in community-dwelling older adults in China. *Zhonghua liu Xing Bing xue zazhi* 2019;40:272-6.
49. Carmona-Torres JM, Rodríguez-Borrego MA, Laredo-Aguilera JA, López-Soto PJ, Santacruz-Salas E, Cobo-Cuenca AI. Disability for basic and instrumental activities of daily living in older individuals. *PLoS One* 2019;14:e0220157.
50. Griffith L, Raina P, Wu H, Zhu B, Stathokostas L. Population attributable risk for functional disability associated with chronic conditions in Canadian older adults. *Age Age* 2010;39:738-45.
51. Maresova P, Javanmardi E, Barakovic S, Barakovic Husic J, Tomsone S, Krejcar O, et al. Consequences of chronic diseases and other limitations associated with old age—A scoping review. *BMC Public Health* 2019;19:1-17.
52. Bahat G, Tufan F, Bahat Z, Tufan A, Aydin Y, Akpınar TS, et al. Comorbidities, polypharmacy, functionality and nutritional status in Turkish community-dwelling female elderly. *Aging Clin Exp Res* 2014;26:255-9.
53. Sharma R. Functional status, social support and quality of life as determinant of successful aging. *Gerontol Geriatr Res* 2020;6:1041.
54. Rajan KB, Hebert LE, Scherr PA, Mendes de Leon CF, Evans DA. Disability in basic and instrumental activities of daily living is associated with faster rate of decline in cognitive function of older adults. *J Gerontol Biomed Sci Med Sci* 2013;68:624-30.
55. Bleijenberg N, Zuithoff N, Smith AK, De Wit N, Schuurmans M. Disability in the individual ADL, IADL, and mobility among older adults: A prospective cohort study. *J Nutr Health Aging* 2017;21:897-903.