

Investigating the relationship between employment after retirement and psychological well-being and depressive symptoms in university retirees

Mobina Khanaghahi

Shahid Beheshti University of Medical Sciences

Yadollah Abolfathi Momtaz

University of Social Welfare and Rehabilitation Sciences

Mohammad Heydari

Tehran University of Medical Sciences

Masoumeh Sadeghipour Roudsari

sadeqipur@yahoo.com

Shahid Beheshti University of Medical Sciences

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Abstract

Background

Over the past few decades, the increasing older adult population in Iran has made it necessary to pay attention to issues such as their psychological well-being. Retirement, as one of the major challenges of old age, can change social and occupational roles and affect mental health. This study aimed to determine the association between post-retirement employment and psychological well-being and depressive symptoms among retirees of Shahid Beheshti University of Medical Sciences.

Methods

This cross-sectional study was conducted in 2025 on 350 retirees of Shahid Beheshti University of Medical Sciences who were selected by systematic random sampling from the retirement center list. Data were collected through telephone interviews using a demographic checklist, the Self-Rated Health (SRH) questionnaire, the Job Satisfaction Scale (JSS), the Geriatric Depression Scale (GDS-15), and the WHO Well-Being Index (WHO-5). Data analysis was performed using SPSS version 16, and chi-square test, independent t-test, ANOVA, Pearson/Spearman correlation, and multiple linear and logistic regression were employed.

Results

Of all participants, 52% were male, and the mean age of the retirees was 56.23 years. The results showed that 33.1% of retirees were employed after retirement, and re-employment was significantly associated with reduced depressive symptoms ($P = 0.001$) and increased psychological well-being ($t = -4.559$, $P < 0.001$). Furthermore, the logistic regression model revealed a significant association between re-employment and depressive symptoms ($P = 0.033$); such that employed retirees had a lower chance of depression compared to non-employed retirees. This indicates that re-employment is associated with a reduced likelihood of depression. ($OR = 2.727$). Additionally, re-employment ($\beta = 6.187$, $P = 0.013$) and full satisfaction with the previous job ($\beta = 19.264$, $P = 0.001$) had a significant positive association with psychological well-being.

Conclusion

There was a significant direct relationship between post-retirement employment and psychological well-being and depressive symptoms, such that employed retirees had higher well-being and lower depression. Paying attention to providing re-employment opportunities for academic retirees can play an effective role in designing interventions to promote mental health and prevent depression in this population.

Background

Global population aging, driven by medical advancements, is an inevitable phenomenon affecting nearly all nations (1). WHO estimates place the global older adult population at approximately one billion in 2019, projected to reach 1.2 billion by 2050, with developing countries like Iran experiencing faster growth (2). In Iran, this demographic is expected to comprise 32% of the population by 2051–2052 (3). This shift brings retirement into focus as a critical life transition. Correspondingly, Iran's retiree population increased by 330,000 between 2016 and 2022 (4). Given that retirement significantly impacts individuals' later years, understanding its psychological, social, and economic dimensions is imperative.

Retirement, typically occurring at age 60 or older, signifies disengagement from one's primary occupational role. However, individual experiences vary considerably. While some retirees feel confused, aimless, or depressed due to role ambiguity, others view retirement as a planned opportunity to pursue personal interests. Consequently, its consequences are highly individualized (5).

Consequently, many retirees choose to continue their previous careers or embark on new ones. Simultaneously, rising life expectancy and declining birth rates have increased the non-working-to-working population ratio, straining labor markets and pension systems. This context has elevated the significance of post-retirement employment, which is increasingly embraced in various societies (6). Retirees return to work for diverse reasons—voluntarily or out of necessity—and may engage in part-time or full-time roles (7). In developed nations, extended life expectancy has led a sizable portion of retirees to remain active in the workforce (8). with some pension systems even developing policies to support this trend (9). Harnessing the experience of retired professionals, especially in academic and healthcare sectors, presents a valuable societal asset.

Re-employment can exert variable effects on retirees' psychological status. Globally, the pooled prevalence of depression among older adults is estimated at 35.1% (10). Retirement profoundly affects quality of life and psychosocial functioning. Moreover, well-being—a vital daily resource shaped by social, economic, and environmental conditions—undergoes notable changes during this transition, necessitating focused investigation (11). These figures underscore the critical need to study depressive symptoms and well-being specifically within retiree populations.

Evidence suggests re-employment can affect depression and well-being through divergent pathways—either by preserving a sense of purpose or, conversely, by imposing financial obligations (12). It may facilitate continuity of midlife activity patterns, framing old age as an extension of previous life stages and thereby supporting mental health (13). However, the effects are not uniform; aging alters psychological well-being and depressive risk, and personal decisions surrounding retirement can yield contradictory outcomes. Given this heterogeneity, further contextual research is warranted.

Given Iran's rapidly aging population, comprehensive attention to retirees' mental and subjective well-being is essential. Retirement-induced social role changes significantly influence quality of life, meaning, and life satisfaction (14). Understanding how re-employment relates to psychological well-being and depression is crucial for policymakers designing targeted quality-of-life interventions. However, similar studies—particularly among medical sciences university retirees in Iran—remain scarce. Therefore, this study aims to investigate the associations between well-being, depressive symptoms, and post-retirement re-employment among retirees of Shahid Beheshti University of Medical Sciences, contributing to a more precise understanding of this population's psychosocial status.

Materials and Methods

This study is a cross-sectional, descriptive-analytical investigation. The target population comprised retirees covered by Shahid Beheshti University of Medical Sciences (from 2020 to 2025). Due to the limited size of the study population, Cochran's formula for finite populations was used to calculate the sample size. The total number of retirees was 1,895. Based on a type I error of 0.05, $P = 0.55$ from the study by Salimzadeh (15), and a margin of error of 0.5, the required sample size was estimated at approximately 317. The final sample size, considering a 10% attrition rate, reached 350 participants.

$$n = \frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-p)}$$

$$n = \frac{1895 \times 1.96^2 \times 0.55(1-0.55)}{0.05^2(1895-1)+1.96^2 \times 0.55(1-0.55)} = 317$$

Participants were selected using systematic random sampling from the list of the retirement center. Based on the retirement center list of the university, the total population was divided by the desired sample size, and the interval length (k) was obtained. Then, a starting number was randomly selected, and by adding the interval (k) to that number, the samples

were sequentially selected. Data collection was conducted via telephone; if an individual was unwilling to participate or did not respond, the next person was contacted.

$$k = \frac{\text{Population Size}}{\text{Sample Size}} = \frac{1895}{350} \cong 5$$

The inclusion criteria for the study were: membership in the retirement center of Shahid Beheshti University of Medical Sciences, absence of communication problems, and absence of cognitive impairment (with Abbreviated Mental Test Score). The exclusion criterion was unwillingness of the participants to cooperate.

The AMTS was used for rule out of cognitive impairment. This questionnaire was first developed by Hodkinson in 1972 (16). In Iran, the AMTS was psychometrically evaluated by Foroughan et al. among community-dwelling older adults. This questionnaire had a significant correlation with the diagnostic criteria of DSM-IV and the Mini-Mental State Examination (MMSE) scores ($P < 0.001$). The questionnaire consists of 10 items, with a total score ranging from 0 to 10. Scores of 7 and above met the inclusion criteria for the study (17).

Data Collection Instruments

1. Demographic and occupational information included gender, age, marital status, education level, living arrangements, underlying medical conditions, number of children, number of dependent children, having a second job during the working period, retirement income, spouse's income, type of occupation, duration of retirement, and willingness to work. In addition, a question about employment status was asked: "Are you going to work again after retirement?"
2. Self-Rated Health (SRH) Questionnaire: This single-item questionnaire was developed by Mossey in 1982 (18). Hosseini et al. confirmed its validity among Iranian elderly people in 2018 ($r = -0.35$, $P < 0.001$). The reliability of this instrument was 0.83%. The questionnaire was scaled based on a 5-point Likert scale. The questionnaire asked, "How do you rate your overall health?" (19).
3. Job Satisfaction Scale (JSS): This questionnaire was designed and validated by Dolbier et al. The instrument consists of a single item to measure the level of job satisfaction. Cronbach's alpha coefficient of this questionnaire is 0.73, and its correlation coefficient is 0.82, as reported and compared with the original questionnaire. The questionnaire question is in the form of "In general, how satisfied are you with your job?". The response options range from "completely dissatisfied" to "completely satisfied" on a 7-point Likert scale (20).
4. Geriatric Depression Scale-15 (GDS): This scale was developed by Brink in 1982 and is an instrument for assessing depression in older adults. The scale has 30 yes/no items, with a short version consisting of 15 items (21). The validation of this instrument in Iran was conducted in a study by Malakouti et al. on 204 older adults residing in Tehran. This questionnaire has a Cronbach's alpha of 0.9, split-half reliability of 0.89, and test-retest reliability of 0.58. The sensitivity and specificity of this questionnaire were 0.9 and 0.84, respectively, and based on the results, the GDS had favorable reliability and validity for use in various studies (22).
5. World Health Organization-Five Well-Being Index (WHO-5-P): The World Health Organization Mental Health Questionnaire is an instrument for assessing mental health. This questionnaire consists of five questions related to the past two weeks. Each statement is rated on a 6-point scale. Higher scores on this questionnaire indicate better mental health. The raw score is calculated by summing the numbers of the five responses and ranges from 0 to 25. To obtain a percentage score from 0 to 100, the raw score is multiplied by 4. A percentage score of 0 indicates the worst possible quality of life, and a score of 100 indicates the best possible quality of life. This instrument was validated and deemed reliable among Iranian older adults by Khosravi et al. in 2015. This questionnaire had acceptable internal consistency ($\alpha = 0.94$) and adequate convergent validity with the General Health Questionnaire (GHQ-28) ($r = -0.66$; $P < 0.001$). The sensitivity and specificity of this questionnaire were 0.68 and 0.85, respectively (23).

Data Analysis Method

Data was analyzed using SPSS software version 16. Prior to conducting parametric tests, the normality of the distribution of quantitative variables was examined using the Kolmogorov–Smirnov test. Due to the large sample size and with reference to the central limit theorem, minor deviations from normality did not preclude the use of parametric tests. Descriptive statistics were used to report on the levels of well-being, depressive symptoms, and post-retirement employment. In the analytical statistics, chi-square tests, Fisher's exact test, and the Mann–Whitney U test were employed to examine the association between variables and depressive symptoms. Additionally, independent t-tests, ANOVA, and Pearson/Spearman correlation coefficients were used to assess the relationship between variables and well-being. The simultaneous effects of variables on depressive symptoms and well-being were also examined using multiple logistic and linear regression analyses, respectively.

Results

In this study, 350 retirees from the Retirement Center of Shahid Beheshti University of Medical Sciences participated. The mean age was 56.23 ± 4.198 years, and 33.1% had post-retirement employment. Overall, 40.0% were aged 50–54 years, 2.0% were older than 65 years, approximately 52% were male, and 42.6% of men were employed after retirement. More than 80% were married, 24% had education below a diploma, 73.7% lived with their families, and more than 80% reported moderate or better health status (Table 1).

In bivariate analyses, post-retirement employment was significantly associated with lower depressive symptoms ($P = 0.001$) and higher psychological well-being ($P < 0.001$). Higher education was also associated with lower depressive symptoms and greater well-being (both $P < 0.001$). Health status was significantly related to both depressive symptoms and psychological well-being ($P < 0.001$), while retirees without underlying medical conditions had higher well-being ($P = 0.007$). Having a second job during employment was associated with lower depression, but not significantly ($P = 0.137$). Higher retirement income and having an income-earning spouse were associated with fewer depressive symptoms and better well-being. Voluntary versus forced retirement was not significantly associated with depressive symptoms or psychological well-being ($P = 0.268$ and $P = 0.501$, respectively) (Table 2).

In the simultaneous analysis of factors associated with depressive symptoms, binary logistic regression was used. Variables with a significance level of 0.2 or lower in the bivariate analyses were entered into the model. These variables included employment status, age, education level, marital status, health status, underlying medical conditions, number of children, having a second job during the working period, type of occupation, retirement income, spouse's income, and satisfaction with the previous job. Among these, employment status, health status, spouse's income, and satisfaction with the pre-retirement job were significantly associated with depressive symptoms at certain levels. According to the results, retirees who were not employed after retirement had a higher chance of having depressive symptoms compared to those who were employed after retirement ($OR = 2.727$, $P = 0.033$). The odds of having depressive symptoms among individuals who were very dissatisfied with their previous job was more than seven times higher than among those who were completely satisfied ($OR = 5.787$, $P = 0.011$). Details are presented in Table 3.

Multiple linear regression was used to examine factors associated with psychological well-being. Variables with $P \leq 0.20$ in the bivariate analyses were entered into the model. Post-retirement employment had a positive and significant effect on well-being; retirees who returned to work had, on average, more than six units higher well-being scores ($\beta = 6.187$, $P = 0.013$). Health status was also associated with psychological well-being. Higher job satisfaction was associated with substantially higher well-being scores, with completely satisfied retirees reporting higher scores than completely dissatisfied retirees ($\beta = 19.264$, $P = 0.001$). Education level, underlying medical conditions, and occupation type were not significant (Table 4).

Retirees who were employed after retirement and had no depressive symptoms had a higher mean well-being percentage (79.44%), whereas fully retired retirees with depressive symptoms had a much lower mean well-being percentage (26.56%) (Fig. 1).

Table 1
, Descriptive Statistics According to Post-Retirement Employment Status

Variable		Frequency	Percent
Working condition	Post-retirement employment	116	33.1
	Full retirement	234	66.9
Gender	Male	183	52.3
	Female	167	47.7
Age	Less than 50	24	6.9
	50–54	140	40.0
	55–59	127	36.3
	60–64	52	14.9
	65 and above	7	2.0
Education	Below diploma	84	24.0
	Diploma	88	25.1
	Associate and Bachelor's	115	32.9
	Master's and Doctorate	63	18.0
Marital status	Married	306	87.4
	No married	44	12.6
Living arrangements	Living alone	17	4.9
	Living with spouse	75	21.4
	Living with family	258	73.7
Health Status	Very Poor	19	5.4
	Poor	35	10.0
	Average	84	24.0
	Good	132	37.7
	Very Good	80	22.9
Underlying Diseases	No	39	11.1
	Yes	311	88.9
Number of dependent children	No dependent children	112	32.0
	One dependent child	108	30.9
	Two dependent children	107	30.6
	Three or more dependent children	23	6.6
Number of children	No children	33	9.4
	One child	64	18.3
	Two children	164	46.9

Variable		Frequency	Percent
	Three or more children	89	25.4
Second Job During Employment	No	259	74.0
	Yes	91	26.0
Job Type	Administrative Activity	116	33.1
	Therapeutic Activity	148	42.3
	Educational Activity	12	3.4
	Service Activity	74	21.1
Retirement income	≤ 15	152	43.4
	15–20	124	35.4
	≥ 20	74	21.1
Spouse's income	No Income	190	54.3
	≤ 15	29	8.3
	15–20	65	18.6
	≥ 20	66	18.9
Job Satisfaction During Employment	Completely dissatisfied	14	4.0
	Very dissatisfied	20	5.7
	Somewhat dissatisfied	28	8.0
	Neutral / No opinion	28	8.0
	Somewhat satisfied	104	29.7
	Very satisfied	77	22.0
	Completely satisfied	79	22.6
Time Retirement	One year	138	39.4
	Two years	99	28.3
	Three years	64	18.3
	Four years	32	9.1
	Five years	17	4.9
Voluntary Retirement	No	121	34.6
	Yes	229	65.4

Table 2
, Association of Research Variables with Depressive Symptoms and Psychological Well-Being

Variable		depression		P- value ¹	Well Being		Test Statistic	P- value ²
		Non- Depression	Depression		Mean (%)	St. Deviation		
Working condition	Post- retirement employment	107 (92.2)	9 (7.8)	0.001*	75.41	21.448	t=-4.559	< 0.001*
	Full retirement	183 (78.2)	51 (21.8)		63.62	25.241		
Gender	Man	151 (82.5)	32 (17.5)	0.858*	66.49	25.407	t = 0.825	0.410*
	Woman	139 (83.2)	28 (16.8)		68.67	23.825		
Age	Less than 50	19 (79.2)	5 (20.8)	0.258**	67.50	17.024	r=-0.037	0.492***
	50–54	121(86.4)	19 (13.6)		69.29	23.409		
	55–59	106 (83.5)	21 (16.5)		68.82	24.628		
	60–64	40 (76.9)	12 (23.1)		60.31	28.327		
	65 and above	4 (57.1)	3 (42.9)		62.86	37.503		
Education	Below diploma	60 (71.4)	24 (28.6)	< 0.001**	55.71	27.815	r = 0.312	< 0.001***
	Diploma	67 (76.1)	21 (23.9)		65.09	24.849		
	Associate and Bachelor's	102 (88.7)	13 (11.3)		70.85	22.225		
	Master's and Doctorate	61 (96.8)	2 (3.2)		80.63	14.779		
Marital status	Married	257 (84.0)	49 (16.0)	0.139*	67.80	23.845	t = 0.460	0.648*
	No married	33 (75.0)	11 (25.0)		65.64	29.937		
Living arrangements	Living alone	15 (88.2)	2 (11.8)	0.833*	74.12	27.023	f = 0.803	0.449****
	Living with spouse	62 (82.7)	13 (17.3)		68.64	23.701		
	Living with family	213 (82.6)	45 (17.4)		66.78	24.787		
Health Status	Very Poor	7 (36.8)	12 (63.2)	< 0.001**	40.84	29.411	r = 0.408	< 0.001***
	Poor	23 (65.7)	12 (34.3)		54.51	26.817		
	Average	70 (83.3)	14 (16.7)		60.62	21.603		
	Good	117 (88.6)	15 (11.4)		73.03	20.062		
	Very Good	73 (91.3)	7 (8.8)		77.75	23.821		
Underlying Diseases	No	28 (71.8)	11 (28.2)	0.052*	57.54	27.677	t=-2.710	0.007*
	Yes	262 (84.2)	49 (15.8)		68.78	24.005		
Number of dependent children	No dependent children	94 (83.9)	18 (16.1)	0.452**	70.43	23.474	r=-0.083	0.119**
	One dependent	89 (82.4)	19 (17.6)		65.26	25.631		

Variable		depression		P-value ¹	Well Being		Test Statistic	P- value ²
		Non-Depression	Depression		Mean (%)	St. Deviation		
	child							
	Two dependent children	91 (85.0)	16 (15.0)		69.31	22.579		
	Three or more dependent children	16 (69.6)	7 (30.4)		55.83	31.368		
Number of children	No children	27 (81.8)	6 (18.2)	0.081**	75.39	21.613	r=-0.161	0.002**
	One child	54 (84.4)	10 (15.6)		68.81	20.198		
	Two children	146 (89.0)	18 (11.0)		69.37	24.100		
	Three or more children	63 (70.8)	26 (29.2)		60.31	28.099		
Second Job During Employment	No	210 (81.1)	49 (18.9)	0.137*	65.22	24.684	t=-2.992	0.003*
	Yes	80 (87.9)	11 (12.1)		74.11	23.478		
Job Type	Administrative Activity	96 (82.8)	20 (17.2)	0.002***	69.86	24.359	f = 14.357	< 0.001****
	Therapeutic Activity	131 (88.5)	17 (11.5)		72.03	20.715		
	Educational Activity	12 (100.0)	0 (0.0)		83.00	18.061		
	Service Activity	51 (68.9)	23 (31.1)		52.38	27.388		
Retirement income	≤ 15 million	110 (72.4)	42 (27.6)	< 0.001**	60.29	25.731	r = 0.309	< 0.001***
	15–20 million	108 (87.1)	16 (12.9)		69.10	24.437		
	≥ 20 million	72 (97.3)	2 (2.7)		79.78	16.270		
Spouse's income	No Income	149 (78.4)	41 (21.6)	0.002**	63.96	27.418	r = 0.151	0.005***
	≤ 15 million	25 (86.2)	4 (13.8)		64.55	23.946		
	15–20 million	51 (78.5)	14 (21.5)		68.31	22.286		
	≥ 20 million	65 (98.5)	1 (1.5)		78.36	13.441		
Job Satisfaction During Employment	Completely dissatisfied	8 (57.1)	6 (42.9)	0.001**	43.71	34.067	r = 0.298	< 0.001***
	Very dissatisfied	11 (55.0)	9 (45.0)		54.60	33.549		
	Somewhat dissatisfied	23 (82.1)	5 (17.9)		57.43	24.997		
	Neutral / No opinion	26 (92.9)	2 (7.1)		69.14	17.983		
	Somewhat satisfied	84 (80.8)	20 (19.2)		65.08	23.577		

Variable		depression		P- value ¹	Well Being		Test Statistic	P- value ²
		Non- Depression	Depression		Mean (%)	St. Deviation		
	Very satisfied	70 (90.9)	7 (9.1)		71.84	21.565		
	Completely satisfied	68 (86.1)	11 (13.9)		77.06	20.880		
Time Retirement	One year	115 (83.3)	23 (16.7)	0.630**	67.11	25.097	r=-0.020	0.711***
	Two years	84 (84.8)	15 (15.2)		68.24	23.965		
	Three years	51 (79.7)	13 (20.3)		68.56	24.481		
	Four years	26 (81.3)	6 (18.8)		66.13	22.627		
	Five years	14 (82.4)	3 (17.6)		60.71	30.569		
Voluntary Retirement	No	98 (81.0)	23 (19.0)	0.501*	65.52	25.764	t=-1.109	0.268*
	Yes	192 (83.8)	37 (16.2)		68.59	24.036		
P- value¹: * Chi-square test **Linear-by-Linear ***Fisher's exact								
P- value²: *T-test **Pearson ***Spearman ****ANOVA								

Table 3
, Multivariable Logistic Regression Analysis of Factors Associated with Depression

Variable	Category	OR	Std. Error	95% Wald Confidence Interval	P-value
Working condition	No	2.727	0.472	(1.082, 6.875)	0.033
	Yes	1	.	.	.
Education	Below diploma	2.983	0.974	(0.442, 20.122)	0.262
	Diploma	2.724	0.869	(0.496, 14.945)	0.249
	Associate and Bachelor's	2.288	0.831	(0.449, 11.656)	0.319
	Master's and Doctorate	1	.	.	.
Marital status	No Married	1.239	0.579	(0.398, 3.858)	0.711
	Married	1	.	.	.
Health Status	-	0.570	0.146	(0.428, 0.758)	< 0.001
Underlying Diseases	No	1.797	0.464	(0.724, 4.460)	0.206
	Yes	1	.	.	.
Number of children	-	1.007	0.227	(0.645, 1.570)	0.977
Second Job During Employment	Yes	1.150	0.437	(0.489, 2.705)	0.749
	No	1	.	.	.
Job Satisfaction During Employment	Completely dissatisfied	1.516	0.723	(0.368, 6.251)	.565
	Very dissatisfied	5.787	0.691	(1.495, 22.402)	.011
	Somewhat dissatisfied	0.984	0.660	(0.270, 3.588)	.980
	Neutral / No opinion	0.226	0.864	(0.042, 1.227)	.085
	Somewhat satisfied	0.912	0.474	(0.360, 2.309)	.846
	Very satisfied	0.527	0.564	(0.174, 1.592)	.256
	Completely satisfied	1	.	.	.
Retirement income	-	0.496	0.303	(0.274, 0.898)	0.021
Spouse's income	-	0.849	0.453	(0.555, 1.301)	0.453
Job Type	Educational Activity	0.000	10794.132	(0.000, .)	0.999
	Administrative Activity	0.678	0.444	(0.284, 1.620)	0.382
	Service Activity	0.982	0.619	(0.292, 3.303)	0.977
	Therapeutic Activity	1	.	.	.
Constant		0.974	1.387		0.985

Table 4
, Multiple Linear Regression Analysis of Factors Associated with Psychological Well-Being

Variable	Category	β	Std. Error	95% Confidence Interval	P-value
Intercept		12.454	8.8593	(-4.910, 29.818)	0.160
Working condition	Yes	6.187	2.5032	(1.280, 11.093)	0.013
	No	0 ^a	.	.	.
Education	Master's and Doctorate	6.817	5.1573	(-3.291, 16.926)	0.186
	Associate and Bachelor's	1.617	4.4619	(-7.128, 10.362)	0.717
	Diploma	2.723	3.8930	(-4.907, 10.353)	0.484
	Below diploma	0 ^a	.	.	.
Health Status	-	6.956	1.0150	(4.967, 8.946)	< 0.001
Job Satisfaction During Employment	Completely satisfied	19.264	5.9300	(7.642, 30.887)	0.001
	Very satisfied	14.954	5.9526	(3.287, 26.621)	0.012
	Somewhat satisfied	13.406	5.7407	(2.155, 24.658)	0.020
	Neutral / No opinion	18.908	6.5915	(5.989, 31.827)	0.004
	Somewhat dissatisfied	2.801	6.6407	(-10.214, 15.817)	0.673
	Very dissatisfied	2.484	7.0897	(-11.411, 16.380)	0.726
	Completely dissatisfied	0 ^a	.	.	.
Underlying Diseases	Yes	5.116	3.4395	(-1.625, 11.857)	0.137
	No	0 ^a	.	.	.
Number of children	-	1.740	1.5571	(-1.312, 4.792)	0.264
Number of dependent children	-	-2.795	1.3681	(-5.477, -0.114)	0.041
Retirement income	-	3.009	1.7330	(-0.388, 6.405)	0.083
Spouse's income	-	1.568	1.0741	(-0.537, 3.674)	0.144
Second Job During Employment	Yes	3.461	2.6278	(-1.689, 8.611)	0.188
	No	0 ^a	.	.	.
Job Type	Service Activity	-8.540	4.3775	(-17.120, 0.039)	0.051
	Administrative Activity	3.503	2.6752	(-1.740, 8.746)	0.190
	Educational Activity	-1.158	6.3485	(-13.601, 11.285)	0.855
	Therapeutic Activity	0 ^a	.	.	.
Scale		386.228 ^b	29.1961	(333.042, 447.908)	

Discussion

Based on the findings of this study, the psychological well-being score was significantly higher among retirees who were employed after retirement. Additionally, this group reported a lower percentage of depressive symptoms. This finding is consistent with the results of Herzog and Mascon's studies in Europe and confirms their findings (24, 25). Despite the existence of similar studies, some research, such as Atalay's study in Australia and Madero's in Chile, have reported different percentages of well-being and depression (26, 27). These discrepancies may stem from cross-cultural differences in retirement attitudes, institutional re-employment support, pension adequacy, and welfare-state arrangements. In Iran, where pensions are often inadequate and re-employment support limited, the protective effect of post-retirement employment may be more pronounced than in more generous welfare states.

In the univariate analysis, variables such as employment status, education level, health status, number of children, type of occupation, having a second job during the working period, job satisfaction, and retirement income level had a significant association with psychological well-being. However, in the multivariate analysis, after controlling for confounding variables, only employment status, health status, job satisfaction, and number of dependent children remained significant. Retirees who became re-employed after retirement had higher psychological well-being. This finding may be attributed to the maintenance of active social roles and a sense of belonging to a work institution on the one hand, and a reduction in emotional isolation and negative thoughts on the other, which was consistent with the results of the study by Park et al. conducted on 8,142 Korean retirees (28). In other words, re-employment, by providing context for regular social interactions and creating daily cognitive challenges, can directly enhance psychological well-being and reduce depressive symptoms.

Unlike the variable "number of children," the variable "number of dependent children" was significant in the multivariate analysis and was identified as one of the main determinants of psychological well-being. It appears that an increase in the number of dependent children in the family, due to intensified economic pressures, is associated with a marked decline in psychological well-being. Of course, it should be noted that the economic situation and the prevailing recession in the country also play a determining role in this relationship. For instance, in the study by Potter et al., due to the higher welfare level of the study population, the number of dependent children did not have a significant impact on psychological well-being (29).

Job satisfaction during the working period also showed a direct and significant relationship with psychological well-being. In other words, individuals who had higher job satisfaction during their working life experienced higher psychological well-being in retirement as well; a finding also observed in the study by Lee (30). This association can be explained by several reasons: First, high job satisfaction during working life is typically accompanied by the accumulation of positive psychological resources such as self-efficacy and a sense of meaning in life, which retain their protective effects into old age. Second, individuals with high job satisfaction often possess more effective stress-coping skills and a stronger social support network, from which they continue to benefit after retirement. Third, such individuals are likely to have a more positive attitude toward various stages of life, including retirement, and this optimistic outlook itself constitutes a strong protective factor against the decline of psychological well-being.

This study demonstrated that although variables such as health status, type of occupation, having a spouse, and job satisfaction during the working period are individually associated with depressive symptoms, they lose their explanatory power when entered simultaneously into the regression model. This suggests that the effect of these variables on depression is likely indirect, exerted through variables such as retirement income or employment status. In other words, the results of the multivariate analysis indicate that among all the factors examined, post-retirement re-employment, higher education level, and sufficient retirement income act as the strongest and most independent protective factors against depressive symptoms in academic retirees, while other variables indirectly influence mental health through these three main factors.

Employment status, as the main variable of the study, had a significant association not only with psychological well-being but also with depressive symptoms. Consistent with the findings of international studies by Beck, Park, and Kang, retirees who engaged in re-employment after retirement experienced fewer depressive symptoms (31–33). Post-retirement re-

employment may protect retirees' mental health through interrelated mechanisms: it provides a purposeful daily structure that curbs rumination and negative thoughts, fosters meaningful social interactions that guard against isolation and depression, and reinforces self-efficacy and perceived usefulness, thereby enhancing resilience to the stresses of aging.

Retirement income status was also identified as another variable affecting depressive symptoms. The findings of this study showed that lower income was associated with a significant increase in depressive symptoms; a finding that is fully consistent with the results of studies by Fernandez and Lee (34, 35). However, it should be emphasized that the strength and direction of this association may be influenced by the economic, social, and cultural context of different societies. In other words, the role of income in predicting depression during retirement is not absolute or universal but rather is moderated by factors such as the level of social welfare, the presence of strong support networks, and economic stability. For instance, in the study by Lee, which was conducted in a region with high economic stability, retirement income did not show a significant association with the level of depression (36); it is possible that the presence of comprehensive government support and an efficient social security system in that society neutralized the negative effects of low income.

Among the strengths of the present study is the simultaneous examination of two important mental health outcomes (psychological well-being and depressive symptoms) in the specific group of academic retirees, which has received little attention in Iran to date. However, this research also had some limitations. The study design was cross-sectional; therefore, a definitive causal relationship between post-retirement employment and psychological well-being and depression cannot be inferred, as it is possible that individuals with higher psychological well-being themselves have a greater tendency to seek re-employment. Additionally, the data were based on self-reports and collected via telephone interviews. Although this method facilitated access to the sample, it carried the potential for recall bias, fatigue, or responses being influenced by momentary conditions. Furthermore, the study population was limited to retirees from a single university; thus, the generalizability of the findings to other retirees (especially those in non-academic occupations or other cities) should be made with caution. Finally, conducting extensive national-level studies on retirees across the country is recommended, as such research could provide more comprehensive and representative information essential for the effective planning of mental health interventions targeting both retirees and the broader elderly population.

Conclusion

The primary findings of this study demonstrate that post-retirement re-employment is independently and significantly associated with higher levels of psychological well-being and reduced depressive symptoms among retirees. Specifically, the multivariate analyses revealed that retirees who were not employed after retirement had nearly three times higher odds of experiencing depressive symptoms compared to those who were re-employed (OR = 2.727, $P = 0.033$), while those who returned to work reported, on average, more than six units higher psychological well-being scores ($\beta = 6.187$, $P = 0.013$), even after controlling for potential confounders. Furthermore, beyond employment status, other significant determinants included health status, spousal income, and pre-retirement job satisfaction. Therefore, policymakers and planners in the field of aging should prioritize the provision of flexible re-employment opportunities for academic retirees, along with integrated support mechanisms—such as accessible healthcare services, financial supplements for low-income households, and pre-retirement counseling programs—to facilitate a successful transition and safeguard the mental health of this growing population.

Declarations

Ethics approval and consent to participate

This study presents an analysis of a separate dataset that was collected in parallel with the author's dissertation project. Although the research questions of the two studies are aligned, the data used in the present article were collected independently. Prior to data collection, this study was approved by the Research Ethics Committee of Shahid Beheshti

University of Medical Sciences (IR.SBMU.RETECH.REC.1404.705). The ethical considerations of Shahid Beheshti University of Medical Sciences are based on national laws, the fundamental principles of bioethics and Islamic values, and the regulations and oversight of the university's internal ethics committees. Retirees' contact details were obtained from the retirees' center, and telephone interviews were conducted following verbal informed consent. All participants provided verbal informed consent prior to participation in the study. Clinical trial number: not applicable.

Consent for publication

Participants provided verbally informed consent for the use of their anonymized data in this research publication. No identifiable personal information is included in this manuscript.

Competing interests

The authors declare that there is no conflict of interest regarding this study.

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Author Contribution

MK contributed to the study conceptualization, data collection, and drafting of the original manuscript. YAM contributed to the conceptualization, study design, and supervision of the research. MH performed formal statistical analysis and contributed to data curation and methodology. MSR supervised the project, administered the study, reviewed and edited the final manuscript, and is the corresponding author responsible for the overall integrity of the work. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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Availability of data and materials

The datasets used and analyzed during this study are available from the corresponding author upon reasonable request. The author(s) used ChatGPT (OpenAI) solely for translation and language editing of this manuscript. The author(s) reviewed and edited the content and take full responsibility for the final version. The tool was not used for data analysis, interpretation, or generation of scientific content.

References

1. World Population Ageing. Fact sheet, Updated 22 July 2024. United Nations Department of Economic and Social Affairs, Division P;; 2023.
2. World Health Organization. 2024. Ageing [Available from: <https://www.who.int/health-topics/ageing>. [Last accessed: 22 sep 2024].

3. World Population Ageing. United Nations Department of Economic and Social Affairs, division p. 2017. Available from: https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Report.pdf. [last accessed: 22 sep 2024].
4. National Pension Fund. 2024. Statistical yearbooks [Available from: <https://www.cspf.ir/analytics/annual-analytics>. [Last accessed: 22 sep 2024].
5. Yeung DY, Zhou X. Planning for retirement: Longitudinal effect on retirement resources and post-retirement well-being. *Front Psychol*. 2017;8(1):1300.
6. Hedge JW, Borman WC. *The Oxford handbook of work and aging*. New York: Oxford University Press, USA; 2012.
7. Monteiro M, Ilmarinen J, Corraa Filho H. Work ability of workers in different age groups in a public health institution in Brazil. *Int J Occup Saf Ergon*. 2006;12(4):417–27.
8. Cahill KE, Giandrea MD, Quinn JF. *Bridge employment*. 2012.
9. Pundt LM, Wöhrmann AM, Deller J, Shultz KS. Differential predictors of post-retirement life and work satisfaction. *J Managerial Psychol*. 2015;30(2):216–31.
10. Cai H, Jin Y, Liu R, Zhang Q, Su Z, Ungvari GS, et al. Global prevalence of depression in older adults: A systematic review and meta-analysis of epidemiological surveys. *Asian J Psychiatr*. 2023;80:103417.
11. World Health Organization. Promoting well-being 2025 [Available from: <https://www.who.int/activities/promoting-well-being>. [Last accessed: 26 July 2025].
12. national library of medicine. depression 2025 [Available from: <https://www.ncbi.nlm.nih.gov/mesh/?term=depression>
13. Bender KA, Jivan NA. What makes retirees happy: Center for Retirement Research at Boston College Boston; 2005. Available from: http://retirementcoachtexas.com/What_Makes_Retirees_Happy_CenterforRet.Research.pdf. [Last accessed: 22 sep 2024].
14. Mobina Khanaghahi YAM. Parisa Taheri Tanjani, Mahshid Namdari, Masoumeh Sadeghipour Roudsari. Investigation of the Relationship between Post-Retirement Employment and Life Satisfaction among Retirees. *Iran J Public Health*. 2026;55(2).
15. Salimzadeh H, Iftikhar H, Reza AP, Beigi AM. Re-employment of retirees and quality of life indicators. *Social Welf Q*. 2007;7(26):287–98.
16. Hodkinson H. Evaluation of a mental test score for assessment of mental impairment in the elderly. *Age Ageing*. 1972;1(4):233–8.
17. Foroughan M, Wahlund LO, Jafari Z, Rahgozar M, Farahani IG, Rashedi V. Validity and reliability of a abbreviated Mental Test Score (AMTS) among older Iranian. *Psychogeriatrics*. 2017;17(6):460–5.
18. Mossey JM, Shapiro E. Self-rated health: a predictor of mortality among the elderly. *Am J Public Health*. 1982;72(8):800–8.
19. Hosseini R, Momtaz Y, Shahboulaghi F, Sahaf R, Soroush M. Validity and reliability of Self Rated Health (SRH) measure among Iranian community-dwelling older adults. *J Gerontol Geriatr*. 2019;67(2):103–8.
20. Dolbier CL, Webster JA, McCalister KT, Mallon MW, Steinhardt MA. Reliability and validity of a single-item measure of job satisfaction. *Am J Health Promotion*. 2005;19(3):194–8.
21. Brink TL, Yesavage JA, Lum O, Heersema PH, Adey M, Rose TL. Screening tests for geriatric depression. *Clin gerontologist*. 1982;1(1):37–43.
22. MALAKOUTI SK, FATH EP, Mirabzadeh A, Salavati M, Kahani S. Validation of geriatric depression scale (GDS-15) in Iran. 2007.
23. Khosravi A, Mousavi SA, Chaman R, Kish MS, Ashrafi E, Khalili M et al. Reliability and validity of the Persian version of the World Health Organization-five well-being index. *Shahroud J Med Sci*. 2015:17–9.
24. Mosconi GVG, Bertuccio P, Amerio A, Odone A. Jan;32:. Transition to retirement impact on risk of depression and suicidality: results from a longitudinal analysis of the Survey of Health, Ageing and Retirement in Europe (SHARE).

25. Herzog AHJ, Morgan JN. Relation of work and retirement to health and well-being in older age. *Psychol Aging*. 1991;6(2):202.
26. Atalay KBG. Retirement routes and the well-being of retirees. *Empirical Economics*. 2022;63(5):2751–84.
27. Madero-Cabib IAA, Guerra J. Simultaneous employment and depressive symptom trajectories around retirement age in Chile. *Aging Ment Health*. 2022;26(6):1143–52.
28. Park YPH, Lee J, Yun B, Yoon JH. Association between working after retirement age and lower depressive symptoms among Korean older adults. *J Affect Disord*. 2025;12:119874.
29. Patel R, Srivastava SMS, P Kumar... Plos one. Gender differential in low psychological health and low subjective well-being among older adults in India: With special focus on childless older adults. 2021.
30. Liu YYX, Wu Y, Xu Y, Zhong Y, Yang S. The relationship between job satisfaction and depressive symptoms among Chinese adults aged 35–60 years: the mediating role of subjective well-being and life satisfaction. *Int J Environ Res Public Health*. 2023;20(3):2023.
31. Kang MYKY, Lee W, Yoon JH. Does long-term experience of nonstandard employment increase the incidence of depression in the elderly? *J Occup Health*. 2016;58(3):247–54.
32. Baek SULY, Won JU, Yoon JH. Interaction between old age and precarious employment on poor mental well-being in workers: Evidence from a nationally representative sample in Korea. *Int J Geriatr Psychiatry*. 2024;39(6):e6106.
33. H Park YH, Y Nam. The effect of employment and occupational factors on late-life depression in Korea. *Journal of occupational and*
34. Fernández-Niño JA, Bonilla-Tinoco LJ, Manrique-Espinoza BS, Romero-Martínez M, Sosa-Ortiz AL. Work status, retirement, and depression in older adults: An analysis of six countries based on the Study on Global Ageing and Adult Health (SAGE). *SSM-population health*. 2018;6:1–8.
35. Li WLE, Balezentis T, Jin H, Streimikiene D. Association between socioeconomic welfare and depression among older adults: Evidence from the China health and Retirement Longitudinal Study. *Soc Sci Med*. 2021;275:113814.
36. Li CNG, Wang L, Chen F. More income, less depression? Revisiting the nonlinear and heterogeneous relationship between income and mental health. *Front Psychol*. 2022;13:1016286.

Figures

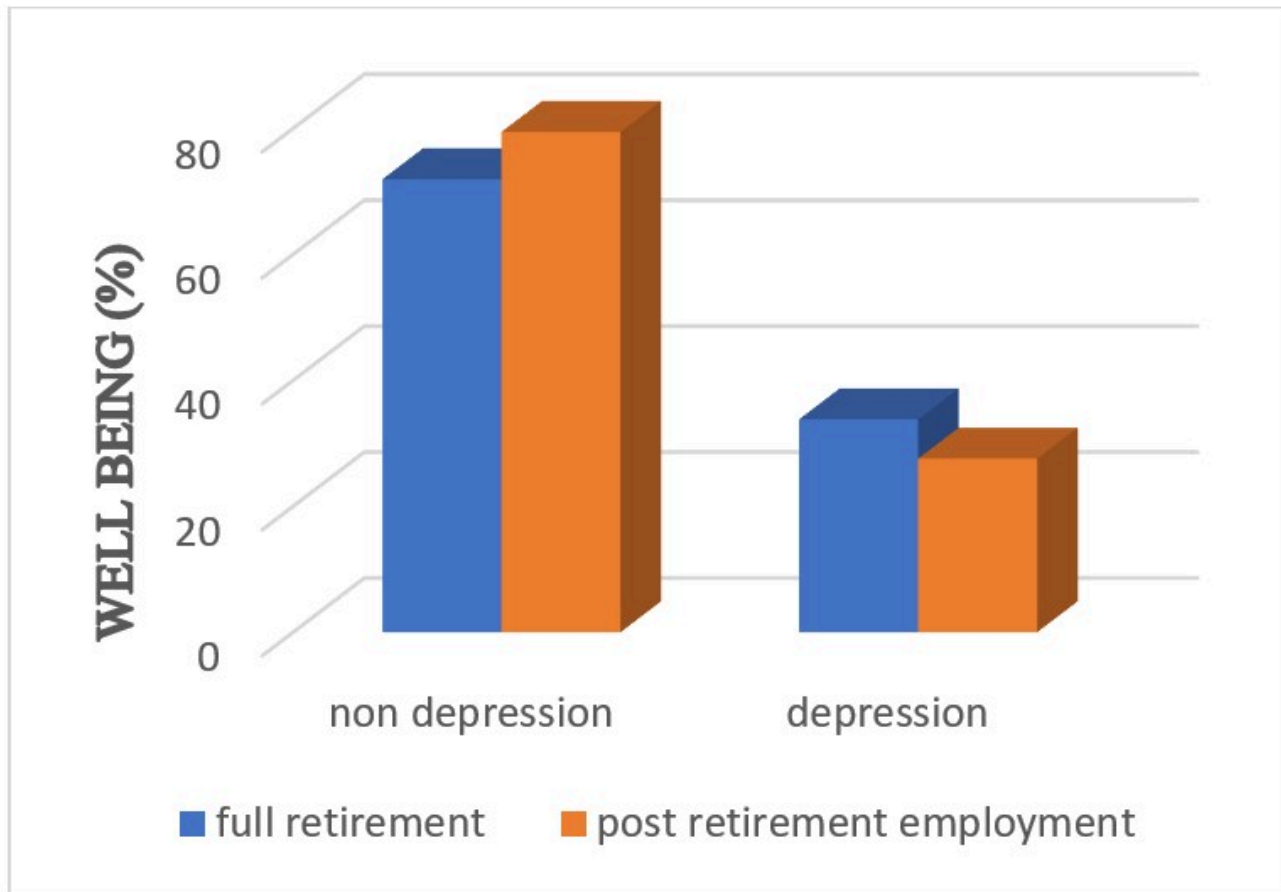


Figure 1

Percentage of psychological well-being stratified by depressive symptom status among retirees with post-retirement employment versus those who were completely retired.