# RESEARCH

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# Personality traits and quality of life: a cross-sectional study in a middle-aged Iranian general population

Danial Habibi<sup>1</sup>, Roqayeh Parsaei<sup>2</sup>, Hamidreza Roohafza<sup>3</sup> and Awat Feizi<sup>4\*</sup>

# Abstract

**Introduction** Despite considerable research on the association between Personality Traits (PT) and Quality of Life (QoL) in patients and older adults, this association remains poorly understood among the middle-aged general population. This investigation examines how each PT is associated with total QoL and its dimensions.

**Methods** The present investigation utilized data collected from a cross-sectional survey involving 786 families in Isfahan (644 female/wife respondents), Iran. QoL and PT were assessed using the validated WHOQOL-BREF and NEO-FFI questionnaires. Other data including demographic and socioeconomic status (SES) were also collected. Statistical analyses included bivariate correlation and simple and multiple linear and logistic regressions.

**Results** Mean value of Psychological health [Mean difference = -4.34, P = 0.003], Physical health [mean difference = -3.93, P = 0.004], and total score of QoL [mean difference = -3.21, P = 0.049] were all significantly lower in women than men. Higher SES score was consistently associated with greater QoL scores (r > 0, P < 0.05). The physical domain and total QoL scores have been negatively correlated with the spouse's age (r < 0, P < 0.05). In crude and adjusted models, higher Neuroticism scores were inversly associated with higher scores of all QoL domains and total QoL (OR < 1, P < 0.05, for all models) while others personality traits except Openness showed a direct association (OR > 1, P < 0.05). Linear regression analysis also confirmed that higher Neuroticism scores were linked to poorer QoL scores (Beta<sub>coefficient</sub> < 0, P < 0.05), while all other traits, except Openness, showed a positive association (Beta<sub>coefficient</sub> > 0, P < 0.05).

**Conclusion** This study provides robust evidence about the significant association of PT with QoL outcomes in middle aged people. This significant association highlights the importance of considering these traits in clinical applications, as tailored interventions based on personality profiles can effectively enhance the well-being of middle-aged individuals.

Keywords Personality Traits, Quality of life, Socioeconomic status, Middle-aged, Iran

\*Correspondence: Awat Feizi Awat\_feiz@hlth.mui.ac.ir Full list of author information is available at the end of the article



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# Introduction

Personality traits (PT) and quality of life (QoL) models have become prominent paradigms in the past three decades [1, 2]. Traditional theories conceptualize that temperaments are established relatively early in life and remain relatively static throughout life, thereby influencing risk factors or themselves acting as determinants of the QoL and the development of psychological and health conditions [3].

The World Health Organization conceptualizes quality of life as an individual's subjective evaluation of their life circumstances, influenced by cultural norms, personal aspirations, and life satisfaction [3, 4]. Personality traits, the enduring patterns of thoughts, feelings, and behaviors that distinguish one individual from another, have been a cornerstone of psychological research. Personality traits, including Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness offer a robust framework for understanding the broad dimensions of human personality [5]. Each of these traits encompasses a range of behaviors and attitudes that shape how individuals perceive and interact with their environment [6].

The interplay between PT and QoL is a critical area of investigation as it offers insights into how intrinsic characteristics can impact subjective well-being. Research suggests that certain personality traits may be predictive of QoL. For instance, high levels of Neuroticism are often associated with poorer QoL due to increased susceptibility to stress and negative emotions [7]. Conversely, traits such as Extraversion, Agreeableness, Conscientiousness, Openness are frequently linked to better QoL through enhanced social interactions and effective coping mechanisms [8–11].

The exploration of the relationship between personality traits and quality of life has garnered significant attention in recent years, given the increasing recognition of the role of individual differences in shaping well-being and overall life satisfaction [12–14]. As far as we know, despite existing consensus suggesting that PT can influence QoL, the specific mechanistic pathways and the precise nature of this relationship based on the Big Five personality traits are poorly understood.

The majority of previous research [15–19] on the relationship between PT and QoL has focused on older adults or individuals with specific physical or mental health conditions. Consequently, there is a significant dearth of studies examining this association among middle-aged populations worldwide. Moreover although, there are considerable researches on the association between PT and QoL in patients and older adults, less studies have been conducted among the middle-aged general population. Despite the critical role of middle-aged individuals in societal and economic development, there is a significant gap in research examining the relationship between PT and QoL within this population. The global shift towards an aging population underscores the importance of understanding factors influencing quality of life during this transitional phase. By examining the relationship between active aging determinants and quality of life, researchers can identify strategies to maintain capabilities throughout life and prepare individuals for a healthy old age. Additionally, this research can inform interventions to promote mental health and address barriers to successful aging.

Accordingly, this study aims to explore the association between the NEO Big Five personality traits and the WHOQOL-BREF dimensions of QoL in the Iranian middle aged general population. We examine how each personality traits is associated with total QoL and each dimension of QoL. By examining these relationships, it is expected this study makes several important contributions to the field. It expands the scope of research in personality psychology by examining the relationship between personality traits and quality of life among middle-aged Iranian individuals, providing valuable data from a culturally unique context. The findings contribute to a better understanding of cultural differences in how personality traits impact quality of life, highlighting the variability and universality of these relationships across different societies. By providing new evidence from an Iranian sample, this study aids in the development and refinement of theoretical models in personality psychology and quality of life, ensuring these models are more inclusive of diverse cultural backgrounds. The results can inform the design of psychological and health interventions tailored to the personality traits of middle-aged adults, potentially improving their quality of life through personalized approaches. This knowledge can help us to shed light on the complex interplay between individual personality profiles and their impact on perceived quality of life, ultimately leading a deeper understanding of human well-being and its determinants.

# Methods

## Study design and participants

The current study used data from a cross-sectional study of 786 families during 2019–2021 in Isfahan, Iran. More details about the study design and participant selection have already been published [20]. Briefly, participants were recruited by using a multistage cluster random sampling method. Based on an estimated prevalence of psychological and emotional problems of 30% and a desired margin of error of 5%, a sample size of 1000 families including children and parents was calculated, accounting for a design effect of 1.2 due to cluster sampling. Ultimately, 800 complete questionnaires were analyzed from the initial 1000 planned participants.

# Measurements

# Quality of life

The World Health Organization Quality of Life-Brief (WHOQOL-BREF) questionnaire comprises 26 items rated on a 5-point Likert scale, with higher scores indicating better perceived quality of life. The total score ranges from 26 to 130. The instrument assesses overall quality of life and general health status, as well as four domains: Psychological, Social, Environmental, and Physical health. The Persian version demonstrated all domains' acceptable internal consistency (Cronbach's alpha>0.7) and test-retest reliability (intraclass correlation > 0.7), and the instrument's convergent validity was also confirmed [21]. We evaluated the internal consistency of the World Health Organization's Quality of Life-BREF questionnaire within our sample data. The obtained alpha coefficients were 0.84 for the Physical domain, 0.83 for the Mental domain, 0.75 for the Social domain, and 0.82 for the Environmental domain. These findings indicate good to excellent internal consistency for all dimensions.

#### Personality traits

Personality traits were assessed using the NEO Five-Factor Inventory (NEO-FFI), a comprehensive measure of the five-factor model. This instrument comprises 60 items distributed across five domains: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Participants rated their agreement with each item on a five-point Likert scale (0=strongly disagree to 4=strongly agree). The Persian version of the NEO-FFI demonstrated adequate psychometric properties. Cronbach's alpha coefficients for the five domains were as follows: Neuroticism ( $\alpha = 0.86$ ), Extraversion ( $\alpha = 0.73$ ), Openness ( $\alpha = 0.56$ ), Agreeableness ( $\alpha = 0.68$ ), and Conscientiousness ( $\alpha = 0.87$ ). We assessed the internal consistency of the NEO Personality Inventory in our sample data. The obtained alpha coefficients were 0.8 for Neuroticism, 0.74 for Extraversion, 0.47 for Openness, 0.63 for Agreeableness, and 0.81 for Conscientiousness. These results indicate good to excellent internal consistency for all dimensions except Openness, which showed a moderate level.

#### Assessment of other variables

Participant demographics variables, including age, education level, number of children, spouse's age, spouse's education, and family socioeconomic status (SES), were collected through a self-administered questionnaire. SES was assessed using the SES-SQ, a validated instrument for the Iranian population [22]. This questionnaire encompassed domains of education, employment, car ownership, technology access (laptop, tablet), and lifestyle factors (leisure, travel).

# Statistical analysis

Continuous and categorical variables are reported as mean ± standard deviation (SD) and frequency (percentage). Normality of continuous variables was assessed using Kolmogorov-Smirnov test and Q-Q plot. We categorized domains scores of QoL based on median values of total and its domains score (i.e., lower (poor) and higher than median (good) QoL). Mean personality traits scores and basic continuous characteristics of study participants were compared between categories of domains scores of QoL using independent samples t-test (or Mann–Whitney U) while chi-squared test was used for categorical variables. We used Pearson or Spearman correlation coefficients for assessing bivariate association of personality traits. We used simple and multiple binary logistic regression to evaluate the crude and adjusted association of personality trait scores as predictors with categorized scores of all domains of QoL and its total scores as dependent variables. Simple and multiple linear regression analyses were also used to evaluate the association of personality trait scores with all domain scores of QoL. In multiple logistic and linear regression, potential confounders including age, gender, socioeconomic status, education level, number of children, spouse's age and spouse's education, marital duration and SES were adjusted when appropriate. The results of logistic regression were reported as odds ratio (OR) and 95% confidence interval for OR while linear regression analysis were reported as the Beta: regression coefficient (95% confidence interval for coefficient). All analyses were performed using R (version 4.4.2) and R Studio (version 2024.04.2 + 764) software.

# Results

# **Demographic characteristics**

The distribution of the demographic variables of the participants in two categories, lower and higher than the median of all four dimensions and overall score of quality of life is shown in Table 1. The mean score of quality of life in all domains and the total was significantly different in people with different education level and wife's education (*P*-value < 0.05).

Gender was significantly different in terms of Physical health [mean difference (female-male) = -3.93, 95%CI: -6.59, -1.27; *P*-value = 0.004], Psychological health [mean difference (female-male) = -4.34, 95%CI: -7.19, -1.48; *P*-value = 0.003], and total score [mean

		Physical health		P-value*	Psychological health		P-value*	Social relations		P-value*	Environment		P-value*	Quality of life		P-value*
Variable		Low	High		Low	High		Low	High		Low	High		Low	High	
Gender	Female	228(39)	356(61)	0.348	378(63.9)	214(36.1)	0.455	308(52.3)	281(47.7)	0.636	314(53.1)	277(46.9)	0.372	292(48.5)	310(51.5)	0.037
(%'N)	Male	45(34.6)	85(65.4)		76(60.3)	50(39.7)		65(50)	65(50)		73(57.5)	54(42.5)		50(38.5)	80(61.5)	
Educa- tion level	Middle School	18(39.1)	28(60.9)	0.075	29(65.9)	15(34.1)	0.025	26(59.1)	18(40.9)	0.051	33(73.3)	12(27.6)	0.002	28(60.9)	18(39.1)	0.005
(%'N)	High School Diploma	104(42.1)	143(57.9)		170(67.7)	81(32.3)		135(54.9)	111(45.1)		145(58.7)	102(41.3)		1 29(5 1.2)	123(48.8)	
	Bachelor	121(39.3)	187(60.7)		195(63.3)	113(36.7)		165(52.7)	148(47.3)		162(51.9)	150(48.1)		145(45.9)	171(54.1)	
	Master	26(29.9)	61(70.1)		50(56.2)	39(43.8)		37(42)	51(58)		39(44.3)	49(55.7)		35(39.3)	54(60.7)	
	PhD	6(20)	24(80)		12(40)	18(60)		10(33.3)	20(66.7)		10(35.7)	18(64.3)		7(22.6)	24(77.4)	
Second	Yes	13(34.2)	25(65.8)	0.599	20(55.6)	16(44.4)	0.391	18(48.6)	19(51.4)	0.741	22(59.5)	15(40.5)	0.470	16(42.1)	22(57.9)	0.628
job(N,%)	No	224(38.5)	358(61.5)		368(62.7)	219(37.3)		301(51.5)	284(48.5)		310(53.4)	271 (46.6)		275(46.1)	321(53.9)	
Wife education	Middle School	48(48)	52(52)	0.006	76(76.8)	23(23.2)	0.003	56(56.6)	43(43.4)	0.002	71(71.7)	28(28.3)	<0.001	68(66)	35(34)	<0.001
(%'N)	High School Diploma	95(43.2)	1 25(56.8)		141(64.1)	79(35.9)		132(60)	88(40)		129(58.4)	92(41.6)		117(52.5)	106(47.5)	
	Bachelor	88(35.2)	162(64.8)		164(64.8)	89(35.2)		1 29(5 1)	124(49)		135(53.6)	117(46.4)		115(44.7)	142(55.3)	
	Master	17(23.3)	56(76.7)		39(51.3)	37(48.7)		31(40.8)	45(59.2)		25(33.8)	49(66.2)		20(26.3)	56(73.7)	
	PhD	22(35.5)	40(64.5)		32(52.5)	29(47.5)		22(35.5)	40(64.5)		22(36.1)	39(63.9)		22(35.5)	40(64.5)	
Age (Mean.	1±SD)	39.42±5.10	39.56±5.81	0.750	39.49±5.15	39.52±5.93	0.942	39.50±5.24	39.44±5.54	0.880	39.49±5.16	39.52±5.93	0.942	39.43±5.10	39.56±5.81	0.750
Marital Dur (Mean±SD)	ration )	15.99±5.29	16.17±5.58	0.667	15.95±5.16	16.20±5.81	0.559	16.01±5.30	16.09±5.18	0.837	15.95±5.16	16.20±5.81	0.559	15.99±5.29	16.17±5.58	0.667
Wife age (N	Mean±SD)	42.75±5.88	42.03±5.55	0.110	42.26±5.93	42.51±5.47	0.584	42.57±5.74	42.20±5.67	0.400	42.26±5.93	42.51±5.47	0.584	42.75±5.88	42.03±5.55	0.110
Socioecon (Mean±SD)	iomic status )	11.56±3.02	12.41±2.87	< 0.001	11.82±2.95	12.68±2.86	< 0.001	11.76±2.88	12.54±2.98	<0.001	11.36±3.02	13.01±2.59	<0.001	11.32±2.99	12.80±2.73	< 0.001
* Resulted	1 from indep	endent samp	oles t-test (or l	Mann-Whitn	ey U test) for cc	ontinuous and	l chi-squared	d for categoric	al variables							

Habibi et al. Health and Quality of Life Outcomes (2025) 23:13 difference (female-male) = -3.21, 95%CI: -6.39, -0.02; *P*-value = 0.049]. Moreover, respondent's education and the educational level of one's spouse both demonstrated statistically significant differences in overall quality of life across various domains and the total score (*P* < 0.05).

People with higher levels of education (Bachelor's, Master's, and PhD) generally report higher scores in all aspects of quality of life compared to those with lower levels of education (Middle School, High School, and Diploma). Similarly, a higher level of spouse's education is associated with higher scores in all aspects of quality of life. There are no significant differences in quality-of-life scores based on age, marital duration, and spouse's age (Table 1).

Significant correlation were observed between SES and total QoL score and its domains. People with high SES consistently reported higher QoL scores in all dimensions (Physical Health, Psychological Health, Social Relations, Environment, and overall QoL) (Fig. 1). Additionally, spouse's age showed a negative relationship with QoL and the physical domain; that is, as the spouse's age increases, the quality of life tends to decrease.

#### Personality traits

domains

Table 2 demonstrates the mean values of personality traits in two categories for each QoL domain and its total score. The mean value of Neuroticism is significantly lower in people who belong to the higher-than-median

category for all QoL domains (P < 0.001). In contrast, other personality traits, except Openness, showed higher mean values in people who were in the lower-thanmedian category for all QoL domains and their total scores (P < 0.001).

Figure 2 also shows the correlation of each personality trait with scores of total quality of life and its domains. As can be seen, Neuroticism showed a significant negative correlation with QoL, while all other personality traits, except Openness, showed a positive association with quality of life (P<0.05).

# Association between personality traits and quality of life

To investigate the relationship between personality traits and quality of life, logistic regression (Fig. 3) was used in a crude model (Model 1A-1E) and adjusted models (Model B: adjusted for sex, age, second job, marital duration, spouse's age, education, and spouse's education, and Model C: Model B with additional adjustment for SES). Figure 3 shows that all personality traits, except Openness, have a significant association with higher QoL scores across all domains and the total score (P < 0.05).

Higher scores of Neuroticism showed a negative association with higher scores in all QoL domains and the total QoL (OR < 1, P < 0.05 for all) in both crude and adjusted models. For example, one unit increase in Neuroticism decreases the odds of being in the higher-thanmedian category for the physical health domain by 11.1%

68 20 50 60 25 50 100 25 50 100 25 75 100 25 50 75 100 0 25 50 Female 60 75 75 100 75 Corr: correlation value; \*: p-value < 0.05; \*\*< p-value between 0.001 and 0.01; \*\*\* = p-value < 0.001 Fig. 1 Overall and subgroup (based on sex) scatter plot and correlation coefficients between SES, wife age, age, and total QoL score and its



Table 2 🛝	Aean value c	of personalit <sub>.</sub>	y traits in :	two categor	ies of (high ā	and low ci	lassified by r	nedian valu	e) quality	of life doma	ins and its to	otal score			
Personality	Physical hea	lth	P-value*	Psychologica	il health	P-value*	Social relatio	ns	P-value*	Environment		P-value*	Quality of life		P-value*
traits	Low	High		Low	High		Low	High		Low	High		Low	High	
Neuroticism	18.12 ± 7.16	24.45 ± 7.45	< 0.001	16.69±6.61	22.73 ± 7.62	< 0.001	17.14±7.03	23.83±7.22	< 0.001	17.53 ± 7.01	23.17±7.55	< 0.001	16.75±6.32	24.96±7.12	< 0.001
Extraversion	$30.88 \pm 5.95$	25.62 ±6.26	< 0.001	$32.40 \pm 5.89$	26.83 ±6.08	< 0.001	31.62 ± 5.91	26.27±5.95	< 0.001	$30.92 \pm 6.36$	$27.03 \pm 6.25$	< 0.001	$31.65 \pm 5.65$	$25.63 \pm 6.05$	< 0.001
Openness	$24.55 \pm 5.14$	24.61 ±4.76	< 0.001	$25.03 \pm 5.45$	24.31 ±4.63	< 0.001	$24.68 \pm 5.15$	24.44±4.81	< 0.001	24.72 ±5.31	24.37±4.77	< 0.001	24.82±5.28	24.18±4.67	< 0.001
Agreeable- ness	33.57 ± 5.64	31.31 ±4.98	< 0.001	34.35 ± 5.96	31.74±4.99	< 0.001	34.37 ±5.55	31.04±4.89	< 0.001	34.05 ± 5.79	31.57±4.92	< 0.001	34.01±5.64	31.17±4.91	< 0.001
Conscien- tiousness	38.03±5.74	33.74±6.16	< 0.001	39.07 ± 5.75	34.94 ± 5.93	< 0.001	38.37 ± 5.76	34.54 ± 5.95	< 0.001	38.08 ± 5.85	34.85 ± 6.26	< 0.001	38.24±5.84	34.16±6.03	< 0.001
* Racultad fro	m independer	nt camples t-tee	st (or Mann-	Whitney II tect											

test)



 $Corr: correlation \ value; *: p-value < 0.05; ** < p-value \ between \ 0.001 \ and \ 0.01; *** = p-value < 0.001 \ Fig. 2 \ Scatter plot and correlation coefficients between personality traits and QoL total score and its domains$ 

(OR = 0.889; 95% CI: 0.879 - 0.920) in crude Model A and by 11.2% (OR = 0.888; 95% CI: 0.859 - 0.917) in fully adjusted Model C.

Higher scores of other significant personality traits were associated with higher odds of being in the good QoL status higher than the median for all domains and the total QoL score. For example, one unit increase in Extraversion score increases the odds of being in the higher-than-median category for the physical health domain by 15.7% (OR=1.157; 95% CI: 1.112–1.204) in the full model; for Agreeableness, it was 10.2% (OR=1.102; 95% CI: 1.058–1.147), and for Conscientiousness, it was 14.1% (OR=1.141; 95% CI: 1.096–1.189). More details about the association of personality traits with other QoL domains, as well as the total QoL score, are presented in Fig. 3, represented by ORs along with 95% CIs for ORs.

We also used linear regression analysis to investigate the association between personality trait scores and all domains as well as total QoL scores (Fig. 4). The results have been presented as regression coefficients and 95% confidence intervals (95% CI) for the regression coefficients. Similar results were obtained from this regression modeling approach: Neuroticism showed a significant negative association with QoL scores in both crude and adjusted models, while other personality traits, except Openness, showed a positive association. Higher scores of Neuroticism were significantly associated with lower QoL scores, while higher scores of Extraversion, Agreeableness, and Conscientiousness were significantly associated with higher QoL scores (Fig. 4).

#### Discussion

In current study, we examined the relationship between personality traits, as assessed by the NEO Big Five Inventory, and quality of life, as measured by the WHO-QOL-BREF, among middle-aged Iranian population. Our findings indicate a significant negative association between neuroticism and overall quality of life as well as its various dimensions. Conversely, we observed positive correlations between extraversion, conscientiousness, and agreeableness with quality of life and its dimensions.

Recent studies strongly emphasized the predictive power of personality traits on well-being, making our findings particularly relevant for both theoretical understanding and practical applications [23, 24].

The strong negative association between Neuroticism and all QoL domains represents one of our most robust findings. The observation that each unit increase in Neuroticism decreases the odds of higher QoL by approximately 11% aligns with existing literature on health-related quality of life [25]. This relationship likely stems from the tendency to experience negative emotions in response to threats, frustrations, or losses. Our finding that Extraversion increases the odds of higher

Models	OR	lower CI	upper (	CI	Α	OR	lower CI	upper C	В		OR	lower CI	upper C	n C	
Model 1A (Y= Physical health)					1				1					1	
Neuroticism	0.889	0.879	0.920	-	1	0.888	0.862	0.916	HH I		0.888	0.859	0.917	HH I	
Extraversion	1.104	1.076	1.132		Here I	1.161	1.118	1.206	1		1.157	1.112	1.204	1	
Openness	1.014	0.985	1.043		Here .	0.973	0.935	1.013		1	0.972	0.931	1.015	+= <u>+</u>	
Agreeableness	1.091	1.061	1.123		HH	1.101	1.060	1.144		HH	1.102	1.058	1.147		н
Conscientiousness	1.094	1.066	1.123		i HH	1.138	1.096	1.182	i		1.141	1.096	1.189		-
Model 1B (Y= Psychological health)					1				1					i	
Neuroticism	0.888	0.867	0.910	HH	1	0.900	0.873	0.928	HH I		0.902	0.874	0.931	HHL I	
Extraversion	1.175	1.139	1.211			1.167	1.122	1.231	1		1.162	1.116	1.211	1	
Openness	1.030	0.999	1.061			1.015	0.976	1.056	E.		1.020	0.979	1.063	i i i i i i i i i i i i i i i i i i i	
Agreeableness	1.095	1.064	1.128		HHH I	1.124	1.080	1.170			1.121	1.076	1.169		-
Conscientiousness	1.139	1.105	1.174		i 🛏	1.176	1.127	1.227	i		1.183	1.130	1.238	i	
Model 1C (Y= Social relations)					1				1					1	
Neuroticism	0.867	0.855	0.898	-	1	0.881	0.855	0.909	HH I		0.878	0.850	0.907	H=1 [	
Extraversion	1.166	1.123	1.200		-	1.183	1.137	1.230			1.182	1.134	1.232	1	
Openness	1.010	0.981	1.039		HH I	0.986	0.949	1.025	+-	-	0.991	0.952	1.032		
Agreeableness	1.131	1.097	1.166		- HE-	1.176	1.128	1.227	i		1.180	1.129	1.233	i	
Conscientiousness	1.120	1.090	1.151		1 +++	1.177	1.131	1.225	i		1.185	1.135	1.238	i	
Model 1D (Y= Environment)					1				1					1	
Neuroticism	0.889	0.879	0.920	-	!	0.901	0.875	0.928	Her I		0.894	0.866	0.924	HH I	
Extraversion	1.104	1.076	1.132		HH	1.125	1.087	1.165		HHH I	1.134	1.092	1.179		••
Openness	1.014	0.985	1.043		μi-μ	0.994	0.956	1.033	-	-	0.999	0.959	1.042	+++	
Agreeableness	1.091	1.061	1.123		j 🛏	1.112	1.069	1.156	i		1.115	1.069	1.162	i H	•
Conscientiousness	1.094	1.066	1.123		1 HH	1.128	1.086	1.171	1	HEH	1.145	1.098	1.194	1.1	-
Model 1E (Y=Quality of life)					1				1					L.	
Neuroticism	0.833	0.810	0.858		1	0.830	0.800	0.861	HH !		0.824	0.791	0.858	H=1	
Extraversion	1.192	1.157	1.229			1.211	1.162	1.262			1.217	1.164	1.273		
Openness	1.026	0.997	1.055		(	0.999	0.962	1.038	H	н	1.001	0.960	1.043		
Agreeableness	1.106	1.074	1.138		1 +++	1.145	1.100	1.192	i		1.141	1.094	1.190	1 1	-
Conscientiousness	1.124	1.094	1.155		I HH	1.167	1.122	1.213		H=H	1.194	1.142	1.249		

Fig. 3 Simple and multiple logistic regression analysis of the association between personality traits and total quality of life and its domains scores

A: crude model model 1); B: adjusted model by sex, age, job, second job, marital status, marital during, wife age, education, and wife education model 2); C: adjusted model by sex, age, job, second job, marital status, marital during, wife age, education, wife education, SES model3). OR: odds ratio

physical health domain scores by 15.7% provides important evidence for the positive role of this personality trait. This association supports previous research demonstrating that Extraversion contributes to enhanced life quality through increased social support and positive life experiences [26]. Individuals with high conscientiousness, extraversion, and agreeableness effectively manage stress through planning and goal-setting, seek and benefit from social support, and utilize constructive conflict resolution and prosocial behaviors to enhance psychological resilience and adaptation [27]. These traits contribute to resilience and enhance the quality of life by empowering individuals to handle life's difficulties more effectively and sustain a positive attitude in the face of challenges [28–30]. Interestingly, Openness did not show significant associations with QoL domains. While Openness is often associated with creativity and adaptability, its limited direct impact on QoL in this study might indicate that traits fostering social cohesion and resilience (e.g., Agreeableness and Conscientiousness) play more crucial roles in enhancing QoL. The lack of significant association between Openness and QoL represents an unexpected finding that merits further investigation. This result differs from some previous studies and suggests that the relationship between Openness and life quality may be more complex or context-dependent than previously thought [31, 32].

The observed gender differences in QoL, with men rating higher than women. The other domains were insignificant. As a result, this difference indicates complicated patterns that require cautious interpretation. These findings align with previous research on gender-specific patterns in quality-of-life outcomes [33], suggesting that gender-specific approaches may be necessary when developing interventions to improve QoL [34, 35].

The observed pattern of higher QoL scores among high SES individuals extends across all measured domains, suggesting a comprehensive impact of socioeconomic factors on overall quality of life. The strong correlation between SES and QoL, as well as its domains, indicates a

Models	Beta	lower CI	upper	CI	Α	Beta	lower CI	upper	CI	В	Beta	lower CI	upper CI	(	2
Model 1A (Y= Physical health)					1					1					1
Neuroticism	-0.548	-0.668	-0.500	14	1	-0.318	-0.358	-0.278	H	1	-0.302	-0.349	-0.256	H	1
Extraversion	0.750	0.651	0.849		-	0.324	0.273	0.375		- H=H	0.297	0.239	0.355		H=H
Openness	0.033	-0.115	0.181		HHH .	0.008	-0.070	0.086		++	-0.047	-0.131	0.036	-	4
Agreeableness	0.515	0.358	0.644		Hel	0.277	0.212	0.342		HH	0.278	0.208	0.348		H
Conscientiousness	0.626	0.517	0.736		i i i i i	0.299	0.242	0.356		i +++	0.324	0.261	0.386		i 🛏
Model 1B (Y= Psychological health)					1					1					1
Neuroticism	-0.769	-0.862	-0.667		1	-0.319	-0.352	-0.285	-	1	-0.295	-0.333	-0.257	H	1
Extraversion	0.888	0.777	0.999		1	0.339	0.296	0.382		HH	0.311	0.263	0.359		HH
Openness	0.193	0.024	0.363			0.035	-0.034	0.105		i -	-0.018	-0.091	0.055	-	4
Agreeableness	0.692	0.547	0.836		IH	0.286	0.230	0.343		HHH I	0.278	0.218	0.337		HH
Conscientiousness	0.793	0.669	0.917		1 101	0.325	0.277	0.373		1 HH	0.317	0.264	0.369		i HH
Model 1C (Y= Social relations)					1					1					1
Neuroticism	-1.132	-1.182	-1.042	=	1	-0.133	-0.153	-0.112	-		-0.123	-0.146	-1.000		1
Extraversion	1.439	1.271	1.607		Hel	0.186	0.144	0.193		H	0.164	0.137	0.190		(m)
Openness	0.236	-0.021	0.493			0.026	-0.012	0.064		(m)	0.014	-0.025	0.054		-1
Agreeableness	1.281	1.065	1.496			0.170	0.139	0.200		1 144	0.170	0.138	0.201		Hel I
Conscientiousness	1.149	0.958	1.341		1 1-1	0.166	0.139	0.193		1 101	0.172	0.144	0.201		1 101
Model 1D (Y= Environment)					1					1					1
Neuroticism	-0.889	-1.009	-0.769	1=1	1	-0.247	-0.294	-0.200	HH	1	-0.230	-0.279	-0.181	H	1
Extraversion	0.897	0.749	1.044		HH	0.267	0.209	0.326		HH	0.257	0.198	0.316		H
Openness	0.210	0.001	0.420			0.032	-0.048	0.112		i i i i i i i i i i i i i i i i i i i	-0.020	-0.103	0.062	-	H
Agreeableness	0.758	0.572	0.944		1 HH	0.244	0.176	0.312		1 HH-1	0.229	0.159	0.300		i ⊨⊷
Conscientiousness	0.754	0.594	0.914		1 1-1	0.283	0.224	0.342		I H=+	0.279	0.215	0.342		I HH
Model 1E (Y=Quality of life)					1					1					1
Neuroticism	-1.151	-1.251	-1.052	-	1	-0.087	-0.102	-0.072		R I	-0.079	-0.095	-0.063		
Extraversion	1.221	1.094	1.349		IH.	0.100	0.081	0.118			0.093	0.074	0.112		H.
Openness	0.241	0.040	0.442		<u>}</u>	-0.005	-0.032	0.021		1 miles	-0.018	-0.045	0.009		Ý
Agreeableness	0.964	0.794	1.135		1 141	0.078	0.055	0.101		1 🛤	0.076	0.053	0.099		I 🗮
Conscientiousness	0.987	0.841	1.132		I HH	0.084	0.063	0.104		1 🖬	0.088	0.068	0.109		1 🛤
				-1 -0	5 0 05 1 15				-0.2	0 02				-0.2	0 02

Fig. 4 Simple and multiple linear regression analysis of the association between personality traits score and total QoL and its domains scores

Results are as Beta (regression coefficient) and 95%CI for beta

robust relationship between economic status and various aspects of well-being. Previous research has shown that health-related behaviors, such as smoking status, physical activity levels, and alcohol consumption, can mediate the relationship between SES and QoL [36, 37].

Our findings have several practical implications: i) Mental health professionals can use personality assessments to identify individuals at risk for lower QoL, ii) The strong influence of education on QoL suggests the importance of promoting higher education access, iii) The observed differences across all QoL domains highlight the need for comprehensive policies and interventions aimed at reducing socioeconomic disparities. Several limitations should be considered when interpreting these results. First, the cross-sectional nature of the study prevents causal inferences. Second, potential selfreport biases in personality and QoL measures. Third, limited generalizability to other cultural contexts. Finally, gender-specific policies are crucial.

The linear regression analyses reinforced these findings, with higher Neuroticism scores consistently associated with lower QoL scores, while the other traits, except Openness, showed a positive association. These results emphasize the importance of addressing personality traits in interventions aimed at improving QoL.

An innovative scientific field that develops rating scales and questionnaires to evaluate clinical connections between PT and QoL dimensions is clinimetrics [38]. SCL-90-R and PHQ-9 tools, for psychological assessment, are samples of highly valid and sensitive re-evaluated instruments by this method [39, 40]. This approach is particularly applicable in clinical research and practice, where accurate and reliable measurement tools are essential for assessing patient outcomes and treatment effectiveness, It often combines quantitative and qualitative methods, offering a more holistic view of the instrument's performance while the traditional methods such as psychometric analyses often emphasize quantitative assessments and may overlook qualitative aspects that are crucial for clinical applicability. Totally the clinimetric approach offers a more comprehensive and patient-centered method for validating clinical instruments, making it a valuable tool in clinical research and practice. Further researches are required for the application of clinimetric methods to studying PT and QoL associations.

# Conclusion

The complex patterns of relationships revealed in this study suggest that personalized approaches to improving QoL, taking into account both personality traits and demographic factors, may be more effective than onesize-fits-all interventions. To enhance the quality of life, it is essential to incorporate the relationship between coping strategies and personality traits into educational interventional programs. Understanding this relationship can lead to the design of more targeted and effective interventions tailored to the individual needs of each person. By teaching coping strategies that align with different personality traits, we can improve mental health and overall well-being, empowering individuals to better handle life's challenges. Future research should focus on developing and testing such targeted interventions while addressing the limitations identified in the current study.

#### Acknowledgements

We would like to express our utmost gratitude to the families who participated effectively and meticulously in this research

#### Authors' contributions

DH: Data cleaning, Programming, Software, Formal analysis, Writing, Original Draft. RP and HR: Writing—Review & Editing. AF: Conceptualization, Data visualization, Verification, Supervision, Writing, Review & Editing.

#### Funding

Not applicable.

#### Data availability

The datasets generated and/or analysed during the current study are not publicly available due to containing information that could compromise the privacy of research participants but are available from the corresponding author on reasonable request.

#### Declarations

#### Ethics approval and consent to participate

Informed consent was obtained from all subjects using the original data. The research was conducted in accordance with the Declaration of Helsinki. The main study was approved by The ethics committee of the National Institute for Medical research Development (NIMAD) (Ethics code: IR. NIMAD. REC.1397.462) and current secondary study was approved by the ethics committee of Babol University of Medical Sciences.

#### **Consent for publication**

Not applicable.

#### **Competing interests**

The authors declare no competing interests.

#### Author details

<sup>1</sup>Department of Epidemiology and Biostatistics, School of Public Health, Babol University of Medical Sciences, Babol, Iran. <sup>2</sup>Department of Biostatistics and Epidemiology, School of Health, Yasuj University of Medical Sciences, Yasuj, Iran. <sup>3</sup>Cardiac Rehabilitation Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, PsychiatristIsfahan, Iran. <sup>4</sup>Department of Epidemiology and Biostatistics, School of Health, and Clinical Toxicology Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

Received: 27 December 2024 Accepted: 5 February 2025 Published online: 17 February 2025

#### References

- 1. Lavi G, Rosenblatt J, Gilead M. A prediction-focused approach to personality modeling. Sci Rep. 2022;12:12650.
- Verdugo MÁ, Schalock RL, Gómez LE. The quality of life supports model as a major component in applying the quality of life paradigm. J Policy Pract Intellect Disabil. 2024;21: e12468.
- 3. Teoli D BA. Quality Of Life [Internet]. 2023. Available from: https://www. ncbi.nlm.nih.gov/books/NBK536962/
- Estoque RC, Togawa T, Ooba M, Gomi K, Nakamura S, Hijioka Y, et al. A review of quality of life (QOL) assessments and indicators: Towards a "QOL-Climate" assessment framework. Ambio. 2019;48:619–38.
- Cobb-Clark DA, Schurer S. The stability of big-five personality traits. Econ Lett. 2012;115:11–5.
- Mammadov S. Big Five personality traits and academic performance: A meta-analysis. J Pers. 2022;90:222–55.
- Wright JD, editor. International Encyclopedia of the Social & Behavioral Sciences. 2nd ed. Amsterdam: Elsevier; 2015.
- Cai L, He J, Wu Y, Jia X. The relationship between big five personality and quality of life of people with disabilities: The mediating effect of social support. Front Psychol. 2023;13:1061455.
- 9. Steel P, Schmidt J, Shultz J. Refining the relationship between personality and subjective well-being. Psychol Bull. 2008;134:138.
- DeNeve KM, Cooper H. The happy personality: a meta-analysis of 137 personality traits and subjective well-being. Psychol Bull. 1998;124:197.
- 11. Lucas RE, Fujita F. Factors influencing the relation between extraversion and pleasant affect. J Pers Soc Psychol. 2000;79:1039.
- 12. Chen C. Mapping the terrain: a scoping review of empirical studies on the big five personality traits and QoL in China. Front Psychol. 2024;14:1335657.
- Summerville S, Kirwan E, Sutin AR, Fortune D, O'Súilleabháin PS. Personality trait associations with quality-of-life outcomes following bariatric surgery: a systematic review. Health Qual Life Outcomes. 2023;21:32.
- Liang X, Zhang P, Luo S, Zhang G, Tang X, Liu L. The association of quality of life and personality characteristics with adolescent metabolic syndrome: a cohort study. Health Qual Life Outcomes. 2021;19:160.
- Baernholdt M, Hinton I, Yan G, Rose K, Mattos M. Factors associated with quality of life in older adults in the United States. Qual life Res. 2012;21:527–34.
- Rassart J, Luyckx K, Verdyck L, Mijnster T, Mark RE. Personality functioning in adults with refractory epilepsy and community adults: Implications for health-related quality of life. Epilepsy Res. 2020;159: 106251.
- 17. Prati G. Correlates of quality of life, happiness and life satisfaction among European adults older than 50 years: A machine-learning approach. Arch Gerontol Geriatr. 2022;103: 104791.
- Imayama I, Plotnikoff RC, Courneya KS, Johnson JA. Determinants of quality of life in adults with type 1 and type 2 diabetes. Health Qual Life Outcomes. 2011;9:1–9.
- Brett CE, Gow AJ, Corley J, Pattie A, Starr JM, Deary IJ. Psychosocial factors and health as determinants of quality of life in community-dwelling older adults. Qual Life Res. 2012;21:505–16.
- Feizi A, Parsaei R, Heidari Z, Haghighatdoost F, Najmi B. Epidemiology of emotional and psychological problems in Iranian children: Protocol of a cross-sectional study in Isfahan. J Res Med Sci Off J Isfahan Univ Med Sci. 2023;28:19.
- Nedjat S, Montazeri A, Holakouie K, Mohammad K, Majdzadeh R. Psychometric properties of the Iranian interview-administered version of the World Health Organization's Quality of Life Questionnaire (WHOQOL-BREF): a population-based study. BMC Health Serv Res. 2008;8:1–7.
- Roohafza H, Feizi A, Gharipour M, Khani A, Dianatkhah M, Sarrafzadegan N, et al. Development and validation of a socioeconomic status shortform questionnaire (SES-SQ). ARYA Atheroscler. 2021;17:1.

- Kang W, Whelan E, Malvaso A. Understanding the Role of Cancer Diagnosis in the Associations between Personality and Life Satisfaction. Healthcare. 2023;11(16):2359.
- 24. Wimmelmann CL, Mortensen EL, Hegelund ER, Folker AP, Strizzi JM, Dammeyer J, et al. Associations of personality traits with quality of life and satisfaction with life in a longitudinal study with up to 29 year follow-up. Pers Individ Dif [Internet]. 2020;156:109725. Available from: https://www.sciencedirect.com/science/article/pii/S0191886919306658
- Huang I-C, Lee JL, Ketheeswaran P, Jones CM, Revicki DA, Wu AW. Does personality affect health-related quality of life? A systematic review PLoS One. 2017;12: e0173806.
- Pocnet C, Antonietti J-P, Strippoli M-PF, Glaus J, Preisig M, Rossier J. Individuals' quality of life linked to major life events, perceived social support, and personality traits. Qual Life Res [Internet]. 2016;25:2897–908. Available from: https://doi.org/10.1007/s11136-016-1296-4
- Galindo-Domínguez H, Bezanilla MJ. The importance of personality and self-efficacy for stress management in higher education. Int J Educ Psychol. 2021;10(3):247–70. https://doi.org/10.17583/ijep.7870.
- Mammadov S, Wang S, Lu Z. Personality types and their associations with psychological resilience, coping with stress, and life satisfaction among undergraduate students: A latent profile analysis approach. Pers Individ Dif [Internet]. 2024;222:112599. Available from: https://www.sciencedir ect.com/science/article/pii/S019188692400059X
- Nieto M, Visier ME, Silvestre IN, Navarro B, Serrano JP, Martínez-Vizcaíno V. Relation between resilience and personality traits: The role of hopelessness and age. Scand J Psychol. 2023;64:53–9.
- Gashi D, Gallopeni F, Imeri G, Shahini M, Bahtiri S. The relationship between big five personality traits, coping strategies, and emotional problems through the COVID-19 pandemic. Curr Psychol [Internet]. 2023;42:29179–88. Available from: https://doi.org/10.1007/ s12144-022-03944-9
- Abu Raya M, Ogunyemi AO, Rojas Carstensen V, Broder J, Illanes-Manrique M, Rankin KP. The reciprocal relationship between openness and creativity: from neurobiology to multicultural environments. Front Neurol. 2023;14:1235348.
- Abu Raya M, Ogunyemi AO, Broder J, Carstensen VR, Illanes-Manrique M, Rankin KP. The neurobiology of openness as a personality trait. Front Neurol. 2023;14:1235345.
- Lee KH, Xu H, Wu B. Gender differences in quality of life among community-dwelling older adults in low- and middle-income countries: results from the Study on global AGEing and adult health (SAGE). BMC Public Health [Internet]. 2020;20:114. Available from: https://doi.org/10.1186/ s12889-020-8212-0
- Moirangthem S, Ojha GJ. Gender Differences in Quality of Life and Subjective Happiness in Indian Elderly: A Cross-Sectional Survey. Indian J Occup Ther [Internet]. 2022;54. Available from: https://journals.lww.com/ iopt/fulltext/2022/54020/gender\_differences\_in\_quality\_of\_life\_and.4. aspx
- Louzado JA, Lopes Cortes M, Galvão Oliveira M, Moraes Bezerra V, Mistro S, Souto de Medeiros D, et al. Gender Differences in the Quality of Life of Formal Workers. Int J Environ Res Public Health. 2021;18.
- de Boer WIJ, Dekker LH, Koning RH, Navis GJ, Mierau JO. How are lifestyle factors associated with socioeconomic differences in health care costs? Evidence from full population data in the Netherlands. Prev Med (Baltim) [Internet]. 2020;130:105929. Available from: https://www.sciencedirect. com/science/article/pii/S0091743519304128
- Yang Y, Wang S, Chen L, Luo M, Xue L, Cui D, et al. Socioeconomic status, social capital, health risk behaviors, and health-related quality of life among Chinese older adults. Health Qual Life Outcomes. 2020;18:291.
- Carrozzino D, Patierno C, Pignolo C, Christensen KS. The concept of psychological distress and its assessment: A clinimetric analysis of the SCL-90-R. Int J Stress Manag. 2023;30:235.
- Cosci F, Christensen KS, Ceccatelli S, Patierno C, Carrozzino D. Patient health Questionnaire-9: a clinimetric analysis. Brazilian J Psychiatry. 2024;46: e20233449.
- Cosci F, Carrozzino D, Patierno C, Romanazzo S, Berrocal C, Chiarugi A, et al. Mental Pain Questionnaire: Clinimetric Properties of a Potential Global Person-Centred Outcome Measure. Clin Psychol Psychother. 2024;31: e70022.

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