

Personality characteristics, sense of coherence, and anxiety among older adults: A structural equation modeling

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Abstract

Research findings have shown that personality characteristics play an important role in studying factors affecting anxiety among older adults. Despite the importance of this relationship, its underlying mechanism is still unclear. Therefore, the aim of this study was to investigate the mediating role of sense of coherence in the relationship between neuroticism and self-esteem as personality characteristics and anxiety among older adults. A cross-sectional and correlational design was used for this study. The sample included 230 community-dwelling older adults (aged 60-97) from November to December 2019 in Tehran. Data were collected through the sociodemographic variables, the Geriatric Anxiety Inventory-20 (Pachana, 2007), the Sense of Coherence-13 scale (Antonovsky, 1993), the Big Five Inventory (Rammstedt & John, 2007) and the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Based on a multi-stage sampling approach, data were collected and analyzed with the structural equation modeling. The older adults with high scores in neuroticism and low self-esteem showed a low level of sense of coherence. Low level of sense of coherence was associated with fewer symptoms of anxiety in older adults. Besides, sense of coherence partially mediated the relationship between personality characteristics (neuroticism and self-esteem) and anxiety in the elderly. Regarding the mediating effect of sense of coherence in the relationship between personality characteristics (neuroticism and self-esteem) and anxiety, improving the level of sense of coherence may be an acceptable intervention to alleviate anxiety among older adults that suffer from neuroticism and low self-esteem.

Keywords: neuroticism, self-esteem, sense of coherence, anxiety, structural equation modeling, older adults.

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Introduction

Nowadays, aging of the population is an inevitable universal phenomenon. According to the estimation of the United Nations, the world population aged ≥ 60 years old would increase from 17.2% in 2017 to 21.3% in 2050 (Nations, 2017). Therefore, the health improvement of older adults, especially their mental health, has turned into a high priority for societies. Anxiety is one of the most challenging health issues among older adults (Olfson et al., 1996). Many pieces of research offer that anxiety is the most complex and widespread disorder among older adults (Chen et al., 2017). According to the National Comorbidity Survey Replication, the prevalence of anxiety among older adults is 15.3% (Kessler et al., 2005). The rate of anxiety among Iranian older adults is also estimated to be 12% in men and 20% in women. Speaking of improving our knowledge about determining risk factors is a considerable step in preventing and treating anxiety among seniors.

Personality factors are among the risk factors that predispose older adults to anxiety (Chen et al., 2017). One continuous personality characteristic that can launch people on a path of experiencing negative emotions, like anxiety, depression, and guilt, is neuroticism (Griffith et al., 2010). People who have a high level of neuroticism are more sensitive to catastrophic and destructive signs of the environment. These individuals may experience more stress when they are faced with stressful or unnatural situations. Some cross-sectional and longitudinal researches report a significant relationship between anxiety and neuroticism (Hansell et al., 2012).

Self-esteem is another anxiety-related personality characteristics (Liu et al., 2014). Some theories, such as terror management theory (Greenberg, 1986) and the cognitive content hypothesis of A. Beck et al. (1992), postulate the relationship between low self-esteem and anxiety (Crocker & Park, 2004). The terror management theory suggests that self-esteem may predict a reduction in subsequent anxiety because high self-esteem is a resistant factor to the awareness of death anxiety in humans, especially the elderly or the cognitive content hypothesis of A. Beck et al. (1992) states that anxiety can be diagnosed based on specific cognitive vulnerabilities such as low self-esteem. Empirical studies have also achieved similar results in this area; for example, the studies of Drageset et al. 2016; Guo et al. 2018;

Fusion et al. 2019. However, this relationship has only rarely been studied in this regard (Orth et al., 2008). Therefore, in this study, self-esteem (as another personality characteristic), was investigated in association with anxiety in later life.

Sense of coherence (SOC) would be one mediational mechanism that refers to a person's worldview and the capacity to respond to stressful situations in Antonovsky's theory (1979). It is not unrelated to the life of older adults due to stressful events that often coincide with this phase, such as decreased physical and cognitive abilities, increased disabilities, and loss of loved ones, especially the death of their spouse. Studies show that individuals with a high sense of coherence believe that they can securely deal with their stress. Antonovsky's theory explains how some individuals remain healthy while they have faced many catastrophic life events. The concept of SOC is the core part of the salutogenic model consisting of three main components: Comprehensibility, manageability, and meaningfulness. The comprehensibility factor implies that inputs from both the internal and external environments are organized, predictable, and explainable. However, manageability evaluates whether resources are sufficient and attainable to satisfy the demands presented by these stimuli (Kikuchi et al., 2014). To put it in another way, the person relies on himself and others (Cohen, 1997). Meaningfulness, the third component, determines whether such demands are worthwhile investments and whether at least some of his daily challenges and demands are an opportunity or a burden for him. As a result, a sense of coherence as a personal tendency provides an emotional, cognitive, and motivational framework for coping with challenges (Kikuchi et al., 2014; Cohen, 1997).

On the other hand, personality traits have also been shown to be related to SOC. Based on the conducted research, individuals with greater neuroticism and low self-esteem may have a low ability to recognize and manage their resources for influential coping with stressors (Miles & Hempel, 2003; Kövi et al., 2017). The greater tendency of these people to experience negative affectivity (i.e. anxiety, anger, and sadness) launch them more on a path of vulnerability to stress compared to people with low neuroticism and high self-esteem levels.

Therefore, it seems reasonable to assume SOC as a potential factor involved in the link between personality characteristics and anxiety in

later life. On this basis, the present study aims to examine the mediating effect of SOC in the association between personality characteristics and symptoms of anxiety in a community sample of older adults living in Tehran. The conceptual framework of the study is presented in Fig. 1. According to what has so far been mentioned, the following hypotheses were suggested:

H1. Neuroticism has a negative relationship with SOC.

H2. SOC has a negative relationship with anxiety.

H3. Sense of Coherence mediates the relationship between neuroticism and anxiety.

H4. Self-esteem has a positive relationship with SOC.

H5. Sense of Coherence mediates the relationship between self-esteem and anxiety.

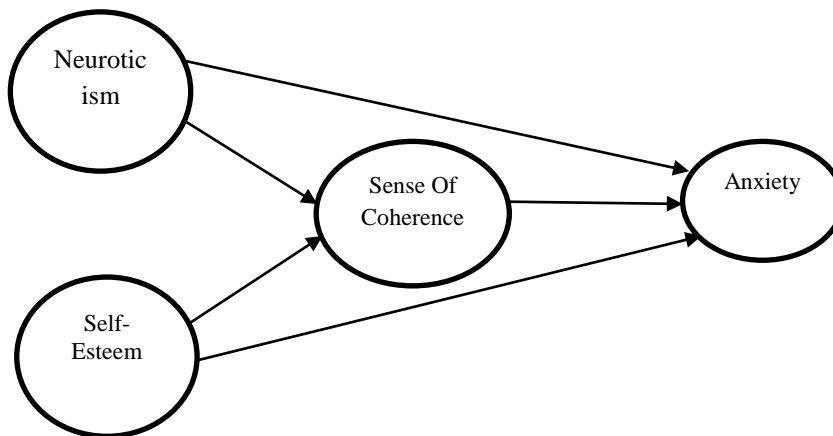


Fig. 1. The Conceptual Framework.

Research Method

This is a correlational study conducted on 230 older adults (60 years old and above) living in Tehran using a structural equation modeling. Individuals were selected using a multi-stage sampling method. Accordingly, four districts of Tehran were randomly selected, and then, from each district, the number of parishes, streets, and alleys were randomly determined, and the older adults of each alley were identified from house to house. The participants were first notified about the research goals. Their participation was completely voluntary, and they could drop out any time. Then, with maintaining people's privacy and confidentiality, the data were collected by two

trained people based on a face-to-face interview containing the following contents:

- Sociodemographic information
- Geriatric anxiety Inventory
- Rosenberg Self-Esteem Scale
- Sense of Coherence scale (short form)
- Big Five Inventory (BFI-10) to assess neuroticism

Table 1 displays the full descriptive statistics of the sample. The number of males was more than females. Most of the respondents (84.0%) were married. 35.9% of the respondents were high school graduate/primary school/and less regarding education level. The majority of the respondents lacked a university degree. Almost half of the participants (49.4%) earned a modest salary.

Table 1. Descriptive statistics of the sample characteristics (N=237)

Variable	Frequency (N)	Percentage (%)
Gender		
male	143	60.3
female	94	39.7
Age	Mean=69.23	S.D.=6.87
marital status		
Single	15	6.3
Married	199	84.0
Separated/divorced/widowed	15	6.3

Measures: Geriatric Anxiety: The Persian version of the Geriatric Anxiety Inventory was used to assess the symptoms of anxiety. This 20-item inventory was developed to assess anxiety in older people. Cronbach's α for the 20-item Geriatric Anxiety Inventory (GAI¹) was 0.91 among normal elderly people indicating reasonable internal consistency (Pachana et al., 2007). The 20-item GAI² has proven valid and reliable in previous clinical settings and research in Iran with

1. Geriatric Anxiety Inventory
2. Geriatric Anxiety Inventory

Cronbach's alpha coefficient of 0.957 (Bandari et al., 1395). In this study, Cronbach's alpha coefficient was 0.845.

Neuroticism: Neuroticism was measured with the Big Five Inventory (BFI¹-10). This inventory consists of five subscales, including neuroticism, and 10 items which responses rate on a five point Likert type scale. Individuals who score high on neuroticism exhibit a greater tendency to experience negative affectivity (i.e., anxiety, anger, and sadness). Different studies speak of sufficient psychometric properties for BFI-10 (Gee et al., 2017). Good validity and reliability of the Persian version of BFI-10 among an Iranian sample were investigated by Mohammadzadeh (Mohammadzadeh et al., 1389). In the current study, adequate internal consistency was provided by Cronbach's alpha coefficient (0.875) for the neuroticism subscale.

Self-esteem: Self-esteem was evaluated using the Rosenberg Self-Esteem Scale (RSES²). This scale, which is one of the most common scales for measuring self-esteem, includes 10 items such as "I am able to do things as well as most other people". Its adequate psychometric properties have been backed up by studies from different countries (Chen et al., 2017). The Persian version has shown acceptable internal consistency in the Iranian sample (Hojat, 1987). In the current study, Cronbach's alpha coefficient was 0.929, indicating adequate internal consistency.

Sense of coherence: Sense of coherence was quantified by applying the brief version of the SOC questionnaire that contains three subcategories: comprehensibility, manageability, and meaningfulness, and 13 items on a five-point Likert type scale. This scale has been widely used in studies across various nations with acceptable internal consistency (Murayama et al., 2015), and its Persian version has shown internal consistency in other studies on older adult Persian people (Nezamdoust Sedehi et al., 2018) with Cronbach's alpha coefficient of 0.77 for the whole scale. In the present study, Cronbach's alpha coefficient was 0.922.

Data analysis: PLS³-SEM¹ method was applied using the SmartPLS 3.2.8 software. PLS-SEM is a fit statistical instrument that

1. Big Five Inventory
2. Rosenberg Self-Esteem Scale
3. Partial Least Square

permits researchers to approximate highly complex models with numerous constructs and indicator variables (Sarstedt et al., 2017). In a common approach, the results are provided in two phases (Chin, 2010). At the first stage, the reliability and validity of the measures were tested, which assured us of using only reliable and valid constructs to estimate the associations between the model's constructs (Hulland, 1999). Then, the evaluation of the structural model was continued at stage 2 (Hair et al., 2017b).

Results

Assessment of the measurement model: In examining the measurement model, both convergent validity and discriminant validity should be verified (Hopkins, 2016). Convergent validity was assessed by considering item loadings, average variance extracted (AVE²), and composite reliability (CR³). The recommended values for item loadings, AVE, and CR should be higher than 0.7, 0.5, and 0.7, respectively (Hair et al., 2012). As shown in Table 2, the measurement model results met the suggested values, thus verifying the acceptable levels of convergent validity. To assess discriminant validity, this study used the heterotrait-monotrait (HTMT⁴) criteria (Henseler & Fassott, 2010). Table 3 demonstrated that all the HTMT values were less than 0.9 (Kline, 2016), and that the criterion for discriminant validity was fulfilled (Table 3).

Table 2. The Measurement Model

constructs	Loading	CR	Alpha	AVE
Anxiety	(0.877,0.908)	0.896	0.845	0.652
SOC	(0.741,0.903)	0.934	0.922	0.526
Neuroticism	(0.935,0.947)	0.941	0.875	0.889
S-E	(0.693,0.898)	0.943	0.929	0.705

SOC: Sense Of Coherence; S-E: self-esteem.

1. Structural Equation Modeling
2. Average Variance Extracted
3. Composite Reliability
4. Hetero-Trait-Monotrait ratio

Table3. The Heterotrait-Monotrait Ratio (HTMT)

Construct	S-E	Anxiety	Neuroticism	SOC
S-E				
Anxiety	0.873			
Neuroticism	0.341	0.496		
SOC	0.736	0.892	0.473	

Notes: SOC: Sense Of Coherence; S-E: self-esteem.

The Structural model: The structural model shows the structural paths amongst the constructs. At this stage, the focus is on the model's predictive capabilities, indicated by the following criteria: coefficient of determination (R2) and cross-validated redundancy (Q2). R2 is the primary criterion for conceptual model evolution. Values of 0.75, 0.50, or 0.25 for the endogenous latent construct are considered substantial, moderate, or weak, respectively (Hair et al., 2011). Table 4 shows that the R2 for the entire model was 0.73, which presented a reasonable explanation of the model.

Q2 value as another means to evaluate the model's predictive accuracy value (Geisser, 1974; Stone, 1974) is built on the blindfolding procedure. Q2 values larger than zero indicate an acceptable path model's predictive accuracy for endogenous constructs. Table 4 shows that all Q2 values are notably above zero, thus providing support for the predictive relevance of the four endogenous constructs (Hair et al., 2011).

Table 4. The Results of R2 and Q2 Values*

Endogenous latent variables	R2	Q2
Anxiety	0.665	0.319
SOC	0.519	0.339

Notes: *Q2 value = 0.02 = small; 0.15 = medium; 0.35 = large & SOC: Sense of coherence.

Assessing the significance of the hypotheses was done by bootstrapping (Chin, 1998). The bootstrapping procedure was accomplished to evaluate the significance of the path coefficients. The results demonstrated that all of the structural relationships were significant at the $p < 0.05$ level.

The negative association between neuroticism and SOC ($\beta=-0.242$; $p < 0.01$) and positive relationship between self-esteem and SOC ($\beta=0.607$; $p < 0.01$) were supported. Hence, H1 and H4 were supported. SOC also had negative relationships with anxiety ($\beta=-0.455$; $p < 0.01$). Therefore, H2 was supported.

Table 5. The Significance Testing Results of the Structural Model Path Coefficient

Hypotheses	Path	Path coefficient	t-value	P-value	Decision
H1	Neuro →SOC	-0.242	4.949**	0.000	Supported
H2	SOC→Anxiety	-0.455	10.191**	0.001	Supported
H4	S-E →SOC	0.607	9.816**	0.000	Supported

Note: Critical t-value for two-tailed test: *1.96, **2.58. Neuro: Neuroticism; SOC: Sense Of Coherence; S-E: self-esteem.

Mediation analysis: The bootstrapping procedure was used to test the mediating effect, and Table 6 shows the mediation analysis results. SOC had a significant mediation effect on the link between both neuroticism and self-esteem and anxiety. The value of VAF¹ presented the strength of the mediating effect. A total of 34.0% of neuroticism's association with anxiety can be explained via the mediating effect of SOC, while 52.6% of self-esteem's link with anxiety can be explained via SOC. Thus, H3 and H5 were also supported.

Table 6. Test of Mediation by the Bootstrapping Approach

Hypo	Path	Estimate's Direct effect	t-value	Estimate's Indirect effect	t-value	VAF	Mediation
H3	Neuro →SOC→Anx	-0.429	7.938**	-0.079	2.108*	0.341	Partial
H5	S-E →SOC→Anx	-0.806	35.124**	-0.467	10.073**	0.526	Partial

Note: Critical t-value for two-tailed test: *1.96, **2.58. Neuro: Neuroticism; SOC: Sense Of Coherence; S-E: self-esteem.

Discussion and Conclusion

The current study investigated the mediating role of sense of coherence in the link between personality characteristics (including self-esteem and neuroticism) and anxiety symptoms among a sample of older adults. For this purpose, we studied how personality characteristics relate to seniors' anxiety through the mediating effect of SOC. Therefore, we proposed and tested five hypotheses as follows:

Based on the achieved results, there was a significant relationship between neuroticism and anxiety among the elderly, supporting the first hypothesis of our research. It seems older adults who scored high on neuroticism had a lower SOC level than those with lower neuroticism. This finding is in line with the studies of Feldt et al. (2007) and Kövi et al. (2017). It seems that individuals with greater neuroticism may have a low ability to recognize and manage their resources for influential coping with stressors. These people tend to experience negative affectivity (i.e. anxiety, anger, and sadness), which is why they are less likely to handle the stressors.

Also, the results demonstrated that sense of coherence was negatively associated with symptoms of anxiety in older adults. This finding verified the second hypothesis of this study. We observed that seniors who had a high level of SOC experienced fewer symptoms of anxiety. Sense of Coherence (SOC), as a person's view of life and capacity to respond to stressful situations, help people manage their life events successfully. This finding was in line with the many studies in the salutogenic field such as McGee et al. (2018) and Eriksson et al.'s (2006) studies which support the salutogenic theory. In Antonovsky's theory, sense of coherence is a key factor in maintaining health and helps people cope more effectively with stressors (which is common in late-life).

Based on the result, the third hypothesis was that neuroticism had an indirect relationship with anxiety among seniors and received support. In the current study, the sense of coherence partially mediated the link between neuroticism and anxiety symptoms. It seems that neuroticism, which had a negative association with SOC, declines a person's ability to cope with stress, leading to an increase in anxiety symptoms in the elderly. People with greater neuroticism experience more negative affectivity, which may make them less capable of

coping with stress. Thus, this debility in stressful situations results in experiencing more symptoms of anxiety.

The significant relationship between self-esteem and sense of coherence of the older adults in this study confirmed the fourth hypothesis of this study. According to the salutogenic literature, some crucial resistant factors such as self-esteem are necessary to strengthen people's sense of coherence. Individuals with low self-esteem find life more meaningless and themselves more helpless to manage the experienced stressors because of their negative attitude towards themselves and their capabilities. This finding is consistent with the studies of Świtaj et al. (2017) and Lindström et al. (2010).

We also found evidence that SOC mediated the relationship between self-esteem and anxiety. Thus the fifth hypothesis that pointed to the indirect effect of SOC in the association between self-esteem and anxiety was verified. This result indicated that the SOC was an underlying mechanism in the link between self-esteem and anxiety. An improving SOC appears to be an acceptable way to mitigate anxiety symptoms among the elderly with low self-esteem. The findings of this study indicated that improving the sense of coherence in older adults who have some personality characteristics such as low self-esteem and neuroticism could be useful strategies to alleviate anxiety symptoms. This research can be a guide for practitioners. Protective factors such as a sense of coherence could lessen the negative impact of undesirable personality traits and the severity of older adults' anxiety symptoms. Practical interventions to increase a sense of coherence can probably reduce anxiety among seniors.

As with any research, the current study had some limitations, which should be put under consideration in further research. First, our study was a cross-sectional survey with correlational design, which makes the casualty conclusion limited. As such, longitudinal studies should further examine our findings. Second, collecting research data coincided with the rise in gas prices and subsequent disturbance in the country. This issue had increased anxiety in the elderly leading to an unfavourable impact on their responses and research results. Additionally, some variables have not been controlled, which may affect the study results, such as gender, marital status, and income. Future studies should include them to control possible confounding effects. Other than that, it is suggested that in future research, the

effect of other personality dimensions should be considered in this regard. In the end, the authors would like to thank all the dear seniors for dedicating time to answer study questionnaires and cooperating with this study researchers.

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