Developing a Predictive Model of Sense of Coherence in Elderly Women Based on Perceived Social Support with the Mediating Role of Ego Strength

Elham. Naeimabadi[1] , Afsaneh. Boostan[2]* , Simindokht. Rezakhani[3]

[1] PhD Candidate in Counseling, Department of Counseling, Ro.C., Islamic Azad University, Roudehen, Iran
[2] Assistant Professor, Department of Counseling, Ro.C., Islamic Azad University, Roudehen, Iran
[3] Associate Professor, Department of Counseling, Ro.C., Islamic Azad University, Roudehen, Iran

* Corresponding author email address: dr.afsanehboostan@gmail.com

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A B S T R A C T

Objective: The present study aimed to develop a predictive model of sense of coherence in elderly women based on perceived social support, with the mediating role of ego strength.

Methods and Materials: This applied research employed a correlational design using structural equation modeling for data analysis. The statistical population consisted of all elderly women who visited health centers in Tehran during the first half of 2024. From this population, 220 participants were selected using convenience sampling. Participants completed Antonovsky's Sense of Coherence Questionnaire, Zimet et al.'s Perceived Social Support Questionnaire, and the Ego Strength Questionnaire developed by Markstrom et al. Data were analyzed using SPSS-24 and AMOS-24. The bootstrap method in the Preacher and Hayes macro was used to assess the mediating variable.

Findings: The results indicated that the structural model demonstrated good fit. All direct and indirect path coefficients between perceived social support and sense of coherence, with ego strength as a mediator, were positively significant.

Conclusion: It is concluded that elderly women with higher levels of sense of coherence tend to receive greater perceived social support, and their personality functions more effectively due to strong cognitive, emotional, and behavioral ego strength, leading to the utilization of more mature defense mechanisms.

Keywords: Aging, Sense of Coherence, Perceived Social Support, Ego Strength.

1. Introduction

According to the World Health Organization, aging refers to the age range after 60 years, which leads to physiological, psychological, and social changes in individuals. With continuous advances in medical science and technology, people around the world are living longer, and the proportion of older adults in various societies is increasing (Zolfaghari et al., 2024). It is projected that by 2050, more than 21% of the global population will be over the age of 60, with 80% of this group residing in low- and middle-income countries. Iran is among the countries with one of the largest aging populations in the world, and

consequently, attention to mental health interventions is increasing (Hamidi et al., 2024). In these circumstances, as older adults become a significant demographic group, examining various aspects of their lives—especially health—has gained substantial importance (Peters, 2023; Salarvand et al., 2023). Healthy aging can be described as a continuous process of optimizing opportunities for improving and maintaining physical, social, and mental health, independence, and quality of life, as well as facilitating a successful transition from one stage of life to another (Kosler et al., 2024).

According to Erikson's theory, generativity and integrity are considered essential aspects of middle and late adulthood (Mousavi Asl & Parouei, 2021). From Antonovsky's perspective, the sense of coherence is a global orientation that expresses the extent to which individuals feel confident, composed, and energized. Based on his salutogenic theory, individuals with a higher sense of coherence experience fewer illnesses, sleep disturbances, and anxiety symptoms (Broersma et al., 2018; Yosefi, 2011). The sense of coherence grows progressively throughout youth until it becomes a relatively stable quality. It explains why some individuals can endure high levels of stress and remain healthy (Mousavi Asl & Parouei, 2021). Morrison and Clift (2006) argue that individuals with a high sense of meaning do not merely overcome unpleasant experiences but perceive them as challenges that require meaning-making, ultimately striving to overcome them. As Bauman noted, when a strong sense of meaning is present, life is perceived more as a challenge than as a burden (Zoromba et al., 2024). Individuals with a strong sense of coherence exhibit better stress management, whereas those with a weak sense of coherence are more vulnerable to health challenges and illness (Moon & Seo, 2024).

Antonovsky identified three components that constitute the concept of sense of coherence: (a) the ability to comprehend what is happening around oneself, (b) the ability to manage situations either independently or with the help of individuals within one's social network, and (c) the ability to find meaning in situations (Kosler et al., 2024). Antonovsky believed that the sense of coherence is a developmental construct that, similar to personality traits, grows during childhood and adolescence and stabilizes around the age of 30. He emphasized early childhood as a critical period for forming a strong sense of coherence and considered the infant as an active subject capable of interacting in ways that foster consistent and stable responses (Fan et al., 2024; Yalnizca-Yildirim & Cenkseven-Önder, 2023; Zadhasan & Gholamzadeh Jofreh, 2023).

Coulon and Lindström (2005) proposed that generalized resistance resources help individuals perceive their lives as stable, structured, and comprehensible. They listed these resources as material assets, self-identity, knowledge, intelligence, coping strategies (rational, flexible, forward-thinking), cultural stability, religion, and philosophy (a collection of consistent responses and a proactive healthy orientation). As Lindström and Eriksson (2005) argued, generalized resistance resources can be found both within individuals and in their environments, extending from material and non-material qualities of individuals to the broader society (Zanjanchi Niko & Farahani, 2024).

Social support, another component in this study, refers to the relationships between individuals that not only provide material assistance and emotional reassurance but also foster a sense of belonging, making individuals feel like they are part of a community Social support is divided into two subtypes: received and perceived. Received social support refers to the actual amount of help obtained, while perceived social support refers to one's personal belief or evaluation of the extent to which social networks (e.g., family and friends) provide informational, instrumental, and emotional support. It has been shown that perceived support plays a more critical role than received support (Takhayori et al., 2021).

Perceived social support refers to the extent to which individuals feel supported by various sources such as friends, family, and others. High perceived social support enhances one's ability to engage cognitive, emotional, and behavioral responses to stressful events. It is associated not only with physical and psychological health but also with psychological resilience, self-esteem, and well-being. Individuals who perceive greater social support experience fewer psychological and behavioral problems and adapt better to both low-stress and high-stress environments (Zolfaghari et al., 2024). Receiving social support from others can aid in accumulating experience in coping with stressful events, increasing self-assessment, perceived competence, cognitive flexibility, and a sense of worth. On the other hand, it diverts attention from stressors and problems, helping individuals enhance psychological adaptation through internal standards, values, and well-being conceptualization, thereby fostering greater resilience in facing adversities (Delkhah et al., 2024; Hamidi et al., 2024).

According to Freud, the founder of psychoanalysis, personality consists of three elements that function together:

the id, which is present at birth and operates on the pleasure principle; the ego, which develops around age three and, by 1923, was described by Freud as a part of the id that is directly influenced by the external world. Unlike the id, the ego understands that others have needs and desires, and that one's actions have consequences. The ego operates on the reality principle, aiming to satisfy the id's demands in socially appropriate and realistic ways. The third component, the superego, emerges by age five through the internalization of caregivers' morals and values (Rajabi et al., 2024; Zanjanchi Niko & Farahani, 2024).

The ego attempts to fulfill the reasonable needs of the id while considering the ideals of the superego and the constraints of reality, thus acting as the decision-maker behind real behaviors—what we typically present to those around us (Bahmani Nia & Sohrabi Shegefti, 2024). Individuals with a well-developed ego effectively mediate between the id and superego and are characterized by a strong capacity to face challenges and provide solutions. The ego is strategic, linear, focused, logical, steady, and grounded in thought. These strengths provide individuals with a healthy ego the self-confidence necessary to confront difficulties and generate effective solutions (Yousefi & Sefarzadeh, 2023). Therefore, if ego strength serves as a critical mediating factor, it can be enhanced through appropriate interventions such as self-regulation training and resilience enhancement, which in turn can improve the sense of coherence and promote psychological and social adjustment.

2. Methods and Materials

2.1. Study design and Participant

The present study was applied in terms of research objective and correlational using structural equation modeling (SEM) as the research method. The statistical population consisted of all elderly women over 60 years of age who visited health centers in Tehran during the first half of 2024. Since the methodology of structural equation modeling closely resembles certain aspects of multivariate regression, the principles of determining sample size in multivariate regression can be applied to SEM as well. According to James Stevens (2002), considering 15 to 20 observations per predictor variable in standard multiple regression analysis is a reasonable rule of thumb (Hooman, 2014). Additionally, due to the broad scope of the statistical population and the unavailability of a complete list of individuals, random sampling was not feasible. Therefore, a total of 220 participants were selected through convenience and voluntary sampling.

The research and data collection process was conducted as follows: First, the questionnaires were designed using the Porsline platform. Following coordination with the Tehran Municipality's General Department of Health, a link to the questionnaires—accompanied by explanations about the research objectives, inclusion criteria (age and gender), and assurances of confidentiality and privacy—was shared with health center administrators. They were then requested to distribute the link across social media platforms and communication channels related to elderly groups.

2.2. Measures

2.2.1. Sense of Coherence

Designed by Antonovsky (1993), this instrument exists in two forms—a long version with 29 items and a short version with 13 items. The present study employed the 13-item version, which includes three subscales: meaningfulness (items 1, 4, 7, 12), comprehensibility (items 2, 6, 8, 9, 11), and manageability (items 3, 5, 10, 13). The items are rated on a 7-point Likert scale, with total scores ranging from 13 to 91. Higher scores indicate a stronger sense of coherence. Scores from 13 to 63 indicate a low sense of coherence, scores from 64 to 79 reflect a moderate sense, and scores from 80 to 91 indicate a high sense of coherence. The internal consistency of this scale has ranged from .82 to .86 across various studies. Its predictive validity has also been reported as relatively strong in longitudinal studies. In a study by Sabri Nazarzadeh, Abdikhodaei, and Tayebi, the content validity of this scale was confirmed. In Iran, the questionnaire was translated and standardized by Mohammadzadeh et al. (2011) on an Iranian student sample, yielding Cronbach's alpha values of .75 for males and .78 for females. In the current study, the reliability of the SOC was measured using Cronbach's alpha and found to be .831.

2.2.2. Perceived Social Support

This 12-item multidimensional instrument, developed by Zimet et al. in 1988, measures perceived social support from three sources: family, friends, and significant others, using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The minimum and maximum scores on the total scale are 12 and 84, respectively, with scores for each subscale (family, friends, and significant others) ranging from 4 to 28. Higher scores indicate greater perceived social

support. In Zimet et al.'s (1988) study, the scale showed good construct validity and a Cronbach's alpha reliability coefficient of .86. In Iran, the instrument was translated and standardized by Salimi, Jokar, and Nikpour (2009). Exploratory factor analysis confirmed the presence of three main factors, and Cronbach's alpha values for the subscales were reported as .86, .86, and .82, respectively. In the current study, the internal consistency of the scale was calculated using Cronbach's alpha and found to be .970.

2.2.3. Ego Strengths

Psychological Inventory of Ego Strengths (PIES) was developed by Markstrom et al. in 1997 to assess ego strength. It evaluates eight dimensions of ego strength: hope, will, purpose, competence, fidelity, love, care, and wisdom. The scale includes 64 items rated on a 5-point Likert scale: 5 (strongly agree), 4 (somewhat agree), 3 (neutral), 2 (somewhat disagree), and 1 (strongly disagree). Reverse-scored items are scored accordingly. The possible score range is 60 to 300, with higher scores indicating higher ego strength. The total score is obtained by summing the item scores. Markstrom et al. (1997) confirmed the face, content, and construct validity of the questionnaire and reported a Cronbach's alpha of .68. In Iran, Altafi Shirmard (2009) reported a Cronbach's alpha of .91 and split-half reliability

of .77 for an Iranian sample. In a study by Aghamohammadian, Ghanbarian Hashemabadi, and Dehghani (2016), the face and content validity of the questionnaire were again confirmed. In the current study, the reliability of the PIES was calculated using Cronbach's alpha and found to be .890.

2.3. Data Analysis

Upon achieving the required sample size, the collected data were analyzed at both descriptive and inferential levels using SPSS-24 and AMOS-24 software.

3. Findings and Results

The study was conducted on 220 elderly women over the age of 60. The descriptive statistics revealed that the mean score for sense of coherence was 65.84 with a standard deviation of 11.97, which indicates a moderate level of coherence among the participants. The mean score for perceived social support was 67.63 with a standard deviation of 11.38, reflecting a relatively high perception of social support. Ego strength had a mean score of 207.20 and a standard deviation of 24.25, suggesting generally high levels of ego strength. The skewness and kurtosis values for all three variables fell within the acceptable range of ±2, confirming the normal distribution of the data (Table 1).

Table 1

Descriptive Statistics for Main Study Variables (N = 220)

Variable	Mean	SD	Skewness	Kurtosis
Sense of Coherence	65.84	11.97	-0.103	0.458
Perceived Social Support	67.63	11.38	-0.472	0.299
Ego Strength	207.20	24.25	-0.434	0.573

In structural equation modeling (SEM), raw data used for analysis must be complete and free from missing values. There are several methods to handle incomplete data. One is listwise deletion, where all cases with any missing values are removed. Another is pairwise deletion, which calculates bivariate correlations only for cases with complete data for the variables in question. An additional approach involves mean substitution for missing data. In the present study, there were no missing values.

To examine univariate outliers, Z-scores for each variable were calculated using SPSS software. None of the standardized scores fell outside the range of ±3, indicating the absence of univariate outliers. Considering that the critical chi-square value with 3 degrees of freedom (number

of predictors minus one) at the 0.001 significance level is 16.266, and based on the Mahalanobis distances, there were no multivariate outliers.

To assess normality, skewness and kurtosis coefficients were used. If the absolute values of skewness and kurtosis fall within the ±2 range, the distribution is considered normal. The skewness and kurtosis values for all variables were within the range of ±2, confirming that the distribution of the collected data did not violate normality assumptions. Therefore, based on the analyses, the data distribution for the variables under study can be considered normal.

The tolerance values were above 0.1, and the variance inflation factor (VIF) values were below 10, confirming the absence of multicollinearity among the predictor variables.

Table 2

*Pearson Correlation Coefficients Between Variables*

Variables	Sense of Coherence	Perceived Social Support	Ego Strength
Sense of Coherence	r = 1.000, p < 0.001	r = 0.538, p < 0.001	r = 0.642, p < 0.001
Perceived Social Support		r = 1.000	r = 0.543, p < 0.001
Ego Strength			r = 1.000

Based on Table 2 and Pearson correlation coefficients, the relationship between psychological capital and sense of coherence (r = 0.551, p < 0.01), perceived social support and sense of coherence (r = 0.538, p < 0.01), loneliness and sense of coherence (r = -0.552, p < 0.01), and ego strength and sense of coherence (r = 0.642, p < 0.01) were all statistically significant. These findings indicate positive and significant relationships between psychological capital, perceived social support, and ego strength with sense of coherence, and a negative and significant relationship between loneliness and sense of coherence. In other words, higher levels of psychological capital, perceived social support, and ego strength, and lower levels of loneliness correspond to higher levels of sense of coherence.

Figure 1

Standardized Coefficients of the Model Examining the Relationship Between Sense of Coherence and Perceived Social Support With the Mediating Role of Ego Strength
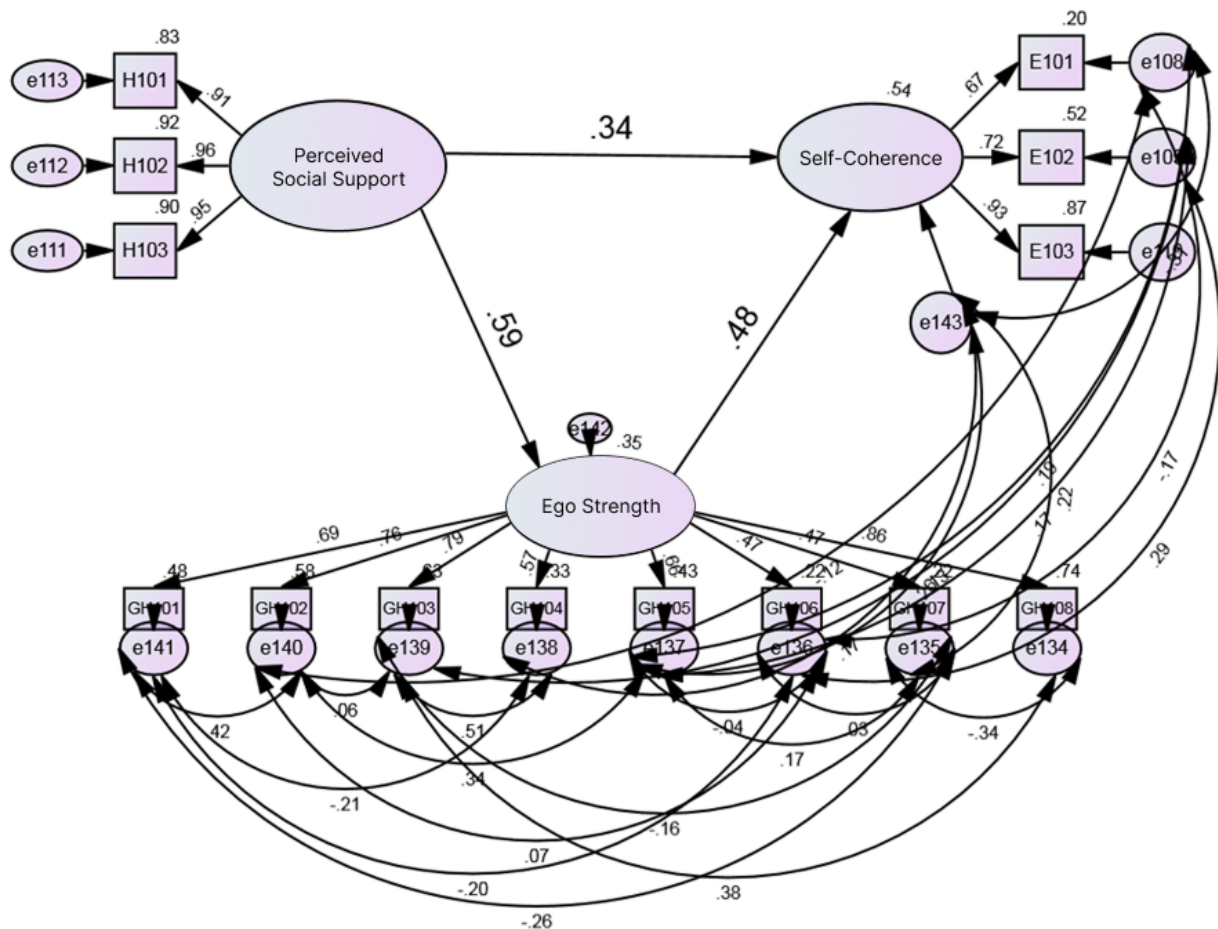
Table 3

Measurement Parameters of Direct Relationships Between Variables

Pathway	Unstandardized Coefficient	Standardized Coefficient	Standard Error	Critical Ratio	Significance Level	R²
Perceived Social Support → Ego Strength	0.362	0.592	0.040	8.96	p < 0.001	0.351
Ego Strength → Sense of Coherence	0.254	0.481	0.045	5.60	p < 0.001	0.544
Perceived Social Support → Sense of Coherence	0.111	0.343	0.023	4.90	p < 0.001	–

As shown in Table 3, all direct paths between the research variables were statistically significant (all p-values < 0.05). According to the results in Table 3, 35.1% of the variance in ego strength was explained by perceived social support, and 54.4% of the variance in sense of coherence was jointly explained by perceived social support and ego strength.

Next, the model was evaluated using goodness-of-fit indices, presented in Table 4.

Table 4

Model Fit Indices

Fit Indices	Acceptable Value	Observed Value
Chi-square/df Ratio	< 3	2.07
Comparative Fit Index (CFI)	> 0.90	0.976
Tucker-Lewis Index (TLI)	> 0.90	0.956
Incremental Fit Index (IFI)	> 0.90	0.976
Normed Fit Index (NFI)	> 0.90	0.955
Goodness-of-Fit Index (GFI)	> 0.90	0.941
Root Mean Square Error of Approximation (RMSEA)	< 0.10	0.07

Due to the presence of a mediating variable, the indirect effects were examined using the bootstrap method. The results are shown in Table 5.

Table 5

Measurement Parameters of Indirect Relationships Between Variables

Pathway	Unstandardized Coefficient	Standardized Coefficient	Standard Error	Lower Bound	Upper Bound	Significance Level
Perceived Social Support → Sense of Coherence (via Ego Strength)	0.092	0.285	0.021	0.062	0.131	p = 0.001

As shown in Table 5, the lower and upper bounds of the confidence interval for the indirect relationship between perceived social support and sense of coherence through the mediating role of ego strength do not include zero, and the p-value is less than 0.05. Therefore, the indirect relationship is statistically significant. In other words, perceived social support can predict sense of coherence in elderly women through the mediating role of ego strength.

4. Discussion and Conclusion

Based on the results of the direct relationships between the study variables in the model, all direct path coefficients were found to be statistically significant (p < .05). According to the findings, 35.1% of the variance in ego strength was explained by perceived social support, and 54.4% of the variance in sense of coherence was jointly explained by perceived social support and ego strength. Additionally, considering the mediating role of ego strength, an indirect and significant relationship was observed between perceived social support and sense of coherence. Although no previous study was found that directly addressed this hypothesis, similar research supports these findings (Hagger et al., 2010; Jiang & Luo, 2021; Khedmati, 2020; Li & Ren, 2024; Nikosefat & Gharehbaghy, 2020; Sarboland, 2017; Takhayori et al., 2021; van Sint Fiet et al., 2022; Vanaken et al., 2021). This indicates that perceived social support plays a mediating role in the relationship between ego strength and distress tolerance.

It can be concluded that social support enables individuals to feel loved, valued, and cared for by others who are present during distress and willing to assist in alleviating difficulties. Therefore, elderly individuals who receive high

levels of social support are less likely to feel isolated and exhibit higher self-regulation in stressful situations. They believe they are loved, respected, and part of a mutually committed network (van Sint Fiet et al., 2022). In contrast, the lack of access to social support causes considerable anxiety in older adults, eventually leading them to question their social competence and ability to form necessary connections (Peters, 2023; Takhayori et al., 2021).

Varied social relationships and perceived social support not only provide vitality and hope but also protect against social isolation and depression. This creates a strong potential for supporting mental health and psychological capital, enhancing overall capability (Zanjanchi Niko & Farahani, 2024; Zolfaghari et al., 2024). High levels of perceived social support contribute to greater interpersonal interaction and resilience, equipping individuals with more effective coping strategies and flexibility in the face of adversity (Yousefi & Sefarzadeh, 2023).

Sorenson, Klangseer, Kleiner, and Klepp (2011) demonstrated that both social support and sense of coherence explained variance in mental health, with their interaction increasing during negative life events. Antonovsky (1979) stated that social support and sense of coherence are closely related. Social support significantly affects the three components of coherence—comprehensibility, manageability, and meaningfulness—and serves as a major resource in developing a strong sense of coherence (Zoromba et al., 2024). According to this model, individuals with high perceived social support tend to use more mature defense mechanisms, report lower psychological distress, and exhibit greater sense of coherence. This is because individuals who perceive strong social support trust that others will be available in times of need, thus perceiving potentially stressful events as less threatening. In fact, perceived social support may directly eliminate or buffer the negative effects of stress.

Consequently, individuals with higher levels of perceived social support report greater coherence. Additionally, since wisdom is one of the components of ego strength, a strong ego contributes to enhanced sense of coherence by enabling cognitively, emotionally, and behaviorally competent functioning, leading individuals to use more mature defense mechanisms. Therefore, elderly women who feel more supported socially also experience greater feelings of security, worthiness, and acceptance. These positive feelings can increase ego strength by enabling them to better confront life challenges and feel more empowered. As a result, stronger ego strength enhances sense of coherence, allowing elderly women to interpret their life experiences with greater consistency and stability, fostering a more enduring and positive identity.

This model demonstrates that social support does not directly lead to greater coherence, but rather, operates through the enhancement of ego strength. In other words, elderly women who receive greater social support become psychologically stronger and consequently experience a higher sense of coherence and identity integration.

5. Limitations and Suggestions

One of the main limitations of this study was the use of a convenience sampling method, which restricts the generalizability of the findings to broader populations of elderly women. Additionally, the study relied solely on self-report questionnaires, which may be influenced by social desirability bias or inaccurate self-perceptions. The cross-sectional design also limits the ability to draw causal inferences between perceived social support, ego strength, and sense of coherence. Furthermore, the study focused only on women over the age of 60 in Tehran, which excludes other age groups, genders, and geographical regions that may exhibit different patterns of association among the variables studied.

Future research should aim to include more diverse and representative samples from different age groups, genders, and cultural backgrounds to enhance the generalizability of findings. Longitudinal or experimental designs are recommended to examine the causal pathways between perceived social support, ego strength, and sense of coherence more accurately. Researchers may also consider incorporating qualitative methods, such as interviews or focus groups, to gain deeper insight into the lived experiences of elderly individuals. Additionally, interventions aimed at strengthening ego functions and enhancing social support networks could be developed and evaluated to improve psychological well-being and coherence in aging populations.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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