ปัจจัยที่สัมพันธ์กับภาวะซึมเศร้าของผู้สูงอายุที่อพยพในเมืองเหวินโจว: การศึกษาภาคตัดขวาง
Factors Associated with Depression among Elderly Migrants in Wenzhou, China: A Cross-sectional Study

นิพนธ์ต้นฉบับ

Original Article

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วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2567;19(3):270-276.

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาระดับภาวะซึมเศร้าและตรวจสอบปัจจัยทำนายภาวะซึมเศร้าในผู้อพยพที่เป็นผู้สูงอายุในเมืองเหวินโจว **วิธีการ:** การศึกษาภาคตัดขวางดำเนินการในเมืองเวิ่นโจว มณฑลเจ้อเจียง ประเทศสาธารณรัฐประชาชนจีน กลุ่มตัวอย่างเป็นผู้สูงอายุที่เป็นผู้อพยพจำนวน 160 คน คัดเลือกจากการสุ่มตัวอย่างแบบแบ่งกลุ่ม รวบรวมข้อมูลด้วยแบบสอบถาม ได้แก่ แบบบันทึกลักษณะประชากร และแบบประเมินความซึมเศร้าผู้สูงอายุ การดูแลตนเอง ความสัมพันธ์ของครอบครัว และการสนับสนุนทางสังคมพหุมิติ ทดสอบค่าสัมประสิทธิ์ความสัมพันธ์ของเพียร์สัน และการถดถอยพหุคูณ **ผลการวิจัย:** คะแนนเฉลี่ยภาวะซึมเศร้าคือ 2.96 ± 2.72 คะแนนซึ่งอยู่ในระดับปกติ ปัจจัยความสัมพันธ์ในครอบครัว (r = -0.461) การดูแลตัวเอง (r = -0. 381) และการสนับสนุนทางสังคม (r = - 0.289) สัมพันธ์ทางลบกับภาวะซึมเศร้าอย่างมีนัยสำคัญทางสถิติ (P-value < 0.001 ทั้งหมด) แต่พบว่ามีเพียงความสัมพันธ์ในครอบครัวที่สามารถทำนายภาวะซึมเศร้าได้อย่างมีนัยสำคัญทางสถิติ (β = -0.343, P-value < 0.001) และอธิบายความแปรปรวนของคะแนนซึมเศร้าได้ร้อยละ 23.0 **สรุป:** ภาวะซึมเศร้าในผู้สูงอายุที่เป็นผู้อพยพอยู่ในระดับปกติ งานวิจัยในอนาคตควรมุ่งเน้นไปที่การเพิ่มความสัมพันธ์ในครอบครัวเพื่อป้องกันภาวะซึมเศร้าในประชากรนี้

คำสำคัญ: ผู้สูงอายุที่เป็นผู้อพยพ; ภาวะซึมเศร้า; การสนับสนุนทางสังคม; การดูแลตัวเอง; ความสัมพันธ์ในครอบครัว

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Abstract

Objectives: To determine depression level and examine the factors predicting depression among elderly migrants in Wenzhou. **Methods:** A cross-section study was conducted in Wenzhou, Zhejiang province, China. A total of 160 elderly migrants were selected by cluster random sampling technique. Data were collected using demographic questionnaire, the Geriatric Depression Scale, the Appraisal of Self-care Agency Scale, the Brief Family Relationship Scale, and the Multidimensional Scale of Perceived Social Support. Pearson correlation analysis and multiple linear regression were used to analyze the associations. **Results:** The average score of depression was 2.96 ± 2.72 points indicating a normal level. Family relationships (r = -0.461), self-care (r = -0.381) and social support (r = -0.289) had a negative correlation with depression with statistical significance (P-value < 0.001 for all). Only family relationships significantly predicted depression (β = -0.343, P-value < 0.001) and could explain 23.0% of the variance in depression scores. **Conclusions:** Depression among elderly migrants in Wenzhou, China was normal. Future research should focus on enhancing family relationships to prevent depression in the elderly migrants.

Keywords: elderly migrants; depression; social support; self-care; family relationship

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Introduction

Elderly migrants, i.e., individuals aged 60 and above who move to live with their children in urban areas for extended periods, have received increasing attention due to the significant impact on their mental health and well-being.[1] Many elderly migrants relocate to help with childcare, a decision often influenced by traditional Confucian values that emphasize family duty and support. This demographic shift introduces complexities, including cultural dislocation, social isolation, and adjustment difficulties, underscoring the importance of understanding and addressing the unique needs of this group.[2,3] Studies indicate that up to 60% of elderly migrants report feelings of loneliness, which are correlated with a 50% increase in the incidence of depressive symptoms compared to their non-migrant peers.[4] Furthermore, anxiety levels in this group are found to be 40% higher, illustrating a direct link between social isolation and deteriorating mental health among elderly migrants. Social isolation emerges as a critical issue for these migrants. A study by Sundström and colleagueson elderly mobility and social ties revealed that relocation can adversely affect the social networks of elderly migrants, leading to heightened isolation.[5] This isolation is linked to increased risks of depression and declines in physical and cognitive health.[6] Migration can also result in shifts in personal identity and self-perception. Litwin and Shiovitz-Ezra explored how life transitions, including relocation, can impact elderly migrants

self-concept and life satisfaction.[7] Their findings underscore the importance of support systems in managing these changes and suggest that a lack of such support can significantly affect well-being. Furthermore, family relationships are likely to evolve, with potential impacts on the independence and autonomy of the elderly migrants, necessitating careful consideration in migration decisions and support planning.[8] The study found that strong emotional support from family members can significantly reduce the perceived stress and enhance the life satisfaction of elderly migrants. This support is crucial, especially considering the challenges of adapting to new environments and the potential social isolation they face.[9]

Recent studies highlight an increasing prevalence of depression among the elderly in China, with detection rates rising to 44.5% by 2018, as shown by research spanning from 2011 to 2018.[10] Further studies reveal significant levels of depressive symptoms and anxiety in the elderly, emphasizing the urgent need for comprehensive mental health assessments.[11] Depression in this demographic is influenced by multiple factors including living arrangements, social support, and physical health. Specifically, research indicates a significant correlation between depression and social isolation.[12] For example, studies conducted in Shandong, China, demonstrate that living conditions and the extent of social support critically impact depression levels among the elderly.[13] This understanding is particularly vital for addressing the unique mental health challenges faced by the elderly, who must navigate family relationships, social isolation, and adjustments to new environments.

Depression is widely recognized in the literature as a distinct medical condition that is not an inherent part of aging but requires specific attention and treatment. Research shows that the prevalence of major depression among elderly migrants varies significantly across settings, approximately 1 - 5% in community settings, 11.5% in hospitals, and 13.5% in long-term care facilities.[14] The causes of depression in elderly migrants are multifactorial, involving a complex interaction of biological, psychological, and social factors. Key life events such as bereavement, retirement, and social isolation can trigger late-life depression.[15]

The biopsychosocial model provides a comprehensive framework for understanding these factors by integrating biological, psychological, and social dimensions. In this context, depression among elderly migrants is influenced by an interplay of biological factors (like chronic diseases), psychological factors (such as stress from life changes), and social factors (including family relationships and social support). Effective management of depression involves comprehensive strategies that address these varied factors: regular physical activity, a healthy diet, quality sleep, and effective stress management are crucial.[16-18] Moreover, the role of family relationships and social support cannot be understated. Positive family dynamics and frequent contact have been shown to lower depressive symptoms and act as protective factors against depression.[19,20] Conversely, isolation and loneliness significantly increase the risk of developing depression, underscoring the need for robust social engagement and support networks for elderly migrants.

Despite extensive research on elderly migrants, significant gaps remain in our understanding, particularly concerning elderly migrants who may be especially vulnerable due to the unique life changes and stressors associated with mobility. This study aimed to describe depression and examine factors predicting depression among elderly migrants in Wenzhou, China. The results could contribute to developing more effective and culturally relevant nursing care practices that could reduce depression and manage mental health challenges among elderly migrants. Overall, this research is crucial in contexts like China, where rapid urbanization and strong family values influence elderly migrant care. The study hypothesizes that social support, self-care, and family relationships could predict depression among elderly migrants.

Methods

This study was a cross-sectional, correlational study on depression and related factors among elderly migrants in Wenzhou, conducted from June to July 2021. Participants were elderly migrants living in the communities under the jurisdiction of Wenzhou City in Zhejiang province for periods typically exceeding six months. To be eligible, they had to be at least 60 years old, be able to communicate in Chinese or native language, have no severe diseases or disability that prevent their participation in this research, have no cognitive impairment measured by Chinese version of Mini-Mental State Examination (MMSE) (with thresholds set at ≤ 17 for the illiterate group, ≤ 20 for those with 6 years of education or less, and ≤ 24 for those with more than 6 years of education),

and have no alcohol or drug dependence or abuse. Exclusion criteria were as follows: 1) severe auditory or speech impairments that hinder effective communication; 2) major psychiatric disorders other than depression, such as schizophrenia or bipolar disorder; 3) undergoing treatment for substance abuse or dependency.

The sample size was estimated by using a 40:1 ratio of participants to predictors for multiple regression.[21] For this study with 3 predictors, this ratio necessitates 120 participants. To account for potential data loss, an additional 25% (40 participants) are added, totaling 160 participants for data collection.

A total of 160 elderly migrants were recruited by using a cluster random sampling method. The 3 districts including Longwan district, Ouhai district, and Lucheng district were random. Based on the elderly population distribution across the city, a proportional random selection process yielded 54 participants each from Longwan and Ouhai districts, and 52 from Lucheng district, for a balanced representation of eligible elderly immigrants in each group.

Data collection was conducted through self-administered questionnaires. The researcher explained and stayed with the elderly to ensure their effective understanding and complete the data. The authors visited randomly selected communities to explain the study's purpose and questionnaire contents to participants. All 160 distributed instructional documents resulted in a 100% return rate of valid questionnaires.

Research instrument

The demographic record form collected characteristics including age, gender, education, marital status, religion, living with children, family members, duration of living with children, original occupation, monthly income, pension insurance, medical insurance, body mass index (BMI) and chronic disease. The following psychosocial measurement questionnaires were permitted for use by their original authors.

The **Chinese version Geriatric Depression Scale (GDS)** was used to measure depression. GDS was originally developed by Yesavage and Brink[22], was adapted into Chinese to assess depression levels among the elderly. It contains 15 items, including three that are reverse-scored, and utilizes a dichotomous scale for responses. The total score can range from 0 to 15 points, with higher scores indicating greater levels of depression, scores between 0 and 4 points suggesting no depression, between 5 and 9 points indicating possible depression, and scores over 10 points denoting depression. Chinese version of the GDS was found to have a good internal consistency with a Cronbach's alpha coefficient of 0.80[23] and of 0.81 in this study.

The Chinese version Appraisal of Self care Agency Scale (ASAS) was used to assess self-care capabilities. ASAS was revised by Guo, Zauszniewski[24] to reflect China's national conditions and drawing upon Sousa and Zauszniewski.[25] It encompasses three 5-item dimensions namely having, developing, and lacking self-care power, using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The total score varies from 15 to 75 points, with higher scores indicating superior self-care ability. ASAS has acceptable to good internal consistency reliability with a Cronbach's alpha coefficient of 0.79 for the original scale[24] and of 0.85 in this study.

The **Chinese version Brief Family Relationship Scale (BFRS)** was used to evaluate family life perceptions. The original BFRS, adapted by Fok and Allen[26] from the Family Environment Scale originally developed by Moos.[27] This version comprises 16 items, including 6 reverse-scored, across three dimensions namely cohesion (7 items), expressiveness (3 items), and conflict (6 items). For this study, a dichotomous scale was used for ease of response by elderly migrants, with "yes" and "no" options. A "yes" to a positively framed item scores 1 point, and a "no" scores 0, with negative items scored inversely. The total possible score ranges from 0 to 16, where a higher score indicates a better family relationship. Internal consistency reliability in this study was good (Cronbach’s alpha coefficient of 0.82).

The Chinese version Multidimensional Scale of Perceived Social Support (MSPSS) was used to assess an individual's perceived social support from family, friends, and significant others. The original MPSSS was developed by Zimet and Powell.[28] It was translated into Chinese by Zhang and Norvilitis.[29] This version comprises 12 items across three subscales specifically peer social support (4 items), family social support (4 items), and significant others social support (4 items). A 7-point Likert scale was used (1 = very strongly disagree to 7 = very strongly agree). The total score ranges from 12 to 84, with 12 - 36 points indicating low support, 37 - 60 points indicating medium support, and 61 - 84 points indicating high support. Higher scores denote greater perceived social support. The scale had a high internal consistency reliability with a Cronbach’s alpha coefficients of

0.961 from the original Chinese version[29] and 0.90 in this present study.

Participant ethical protection

The study was approved by the Internal Review Board, Burapha University (approval number: G-HS038/2564), Wenzhou Medical University, and the Wenzhou Municipal Health Commission. All participants provided informed consent before answering the questionnaire. They were assured of the confidentiality of their responses and the anonymity of reported results. Participants were informed they could withdraw from the study at any time without any adverse consequences.

Statistical analysis

Descriptive statistics including mean wit standard deviation and frequency with percentage were used to summarize demographic and clinical characteristics and study variables. Associations were tested using Pearson's correlation analysis and multiple linear regression with the Enter method. All assumptions of linear correlation and multiple linear regression were met. Statistical significance was set at a type I error of 5%. All statistical analyses were done using the software program SPSS version 20.

Results

Of the 160 participants, their age were in the range of 60 to 87 years with an average age of 66.3 ± 4.92 years. There were more women (61.25%) than men. Less than half of the participants (45.00%) had primary school education. A high proportion were married (90.00%). The majority were farmer (37.50%). Regarding family living arrangements, 45.63% lived in households consisting of five members, while a significant proportion (66.88%) reported living with their children for more than 30 months. In terms of economic status, 41.25% had a monthly income of 420 USD, which is higher than China's per capita disposable income of 413 USD in 2020. Most participants had endowment insurance (84.37%), and a substantial number (63.13%) had rural medical insurance. The majority of the participants reported having at least one chronic disease (66.87%), and more than half (53.27%) had hypertension (i.e., blood pressure ≥ 140/90 mmHg).

Table 1 Demographic characteristics of elderly migrants (N = 160).

Characteristics	N	%	Characteristics	N	%
Gender			**Living with children**		
Male	62	38.75	With daughter	40	25.00
Female	98	61.25	With son	120	75.00
Age (M = 66.3, SD = 4.92, range = 60-87)			**Education**		
60-65	77	48.13	No Education	26	16.25
66-70	56	35.00	Primary school	72	45.00
71-75	21	13.12	Middle school	37	23.12
76-80	4	2.50	High school	14	8.75
≥ 81	2	1.25	University	11	6.88
Marital status			**Original occupation**		
Married	144	90.00	Workers	88	55.00
Divorced	2	1.25	Farmers	60	37.50
Widowed	14	8.75	Others	12	7.50
Family members			**Living duration with children (months)**		
3	18	11.25	6 – 11	15	9.37
4	36	22.50	12 – 17	16	10.00
5	73	45.63	18 - 23	6	3.75
6	33	20.62	24 - 29	16	10.00
			≥ 30	107	66.88
Endowment insurance					
Yes	135	84.37			
No	25	15.63			
Medical insurance			**Monthly income (USD)**		
Employee	51	31.87	No income	34	21.25
Rural	101	63.13	≤ 140	12	7.50
Commercial	1	.63	141 - 420	48	30.00
None	7	4.37	421 - 699	39	24.37
			≥ 700	27	16.88
Chronic disease					
Sporadic disease	53	33.13			
Have chronic disease*	107	66.87			
Diabetes	15	14.01			
Hypertension	57	53.27			
Cardiovascular disease	5	4.67			
Joint disease	22	20.56			
Other chronic diseases	26	24.29			

* More than 1 answer was applicable.

Of the possible 0 – 15 points, the overall **depression** scores for elderly migrants ranged from 0 to 14 points. With a mean of 2.96 ± 2.72 points (Table 2), depression was within normal limit. The **total self-care** scores ranged from 35 to 74 points, with an average score of 56.74 ± 7.81 points indicating a relatively high average score. Specifically, the average score for **having the power for self-care (**24.68 ± 3.64 points) was higher compared to **developing the power for self-care** (19.98 ± 3.16 points) and **lacking the power for self-care** (12.09 ± 3.94 points). The total score for family relationships ranged from 3 to 16 points with a mean of 6.48 ± 1.05 points. Among the three dimensions, scores for perceived social support from each item varied from 4 to 28, with family support receiving the highest mean score at 22.47, reflecting a high level of individual social support, and an overall average of 20.69 ± 5.73 points.

Table 2 Mean and standard deviation of the dependent variable (DV) and independent variables (IDV) (N = 160).

Variable	Range		Mean	SD
	Possible	Actual		
Dependent Variable				
Depression	0 - 15	0 - 14	2.96	2.72
Independent variables				
Self-care	15 - 75	35 - 74	56.74	7.81
Family relationship	0 - 16	3 - 16	13.52	2.78
Social support	12 - 84	25 - 84	62.80	14.96

Self-care and depression were negatively correlated (r = -0.381, P-value < 0.01) suggesting that as self-care increases, depression levels tend to decrease. Family relationships and depression were also negatively correlated (r = - 0461, P-value < 0.01) indicating that stronger family relationships were associated with lower levels of depression. Social support and depression had a negative correlation (r = -0.289, P-value < 0.01) showing that higher social support was related to lower depression levels (Table 3).

Table 3 Correlations between the independent and dependent variables (N = 160).

Variable	Depression	Self-care	Family relationship	Social support
Depression	1.000	-0.381*	-0.461*	-0.289*
Self-care		1.000	0.539*	0.442*
Family relationship			1.000	0.359*
Social support				1.000

* P-value < 0.01.

Self-care, family relationships, and social support together accounted for 23.0% of the variance in depression scores (adj. R^2 = 23.0%, F = 16.845, P-value < 0.001). For individual predicting factors, only family relationships significantly predicted depression in elderly migrants (β = -0.343, P-value < 0.001); while self-care and social support did not (Table 4).

Table 4 Associations between depression and its predicting factors (N = 160).

Predicting variables	B	SE	β	t	P-value	Tolerance	VIF
Self-care	-0.053	0.030	-0.153	-1.756	0.081	.639	1.566
Family relationship	-0.335	0.082	-0.343	-4.097	< 0.001	.692	1.446
Social support	-0.018	0.014	-0.099	-1.254	0.212	.784	1.275
R = 0.495, R2 = 0.245, Adjusted R2 = 0.230, F = 16.845, P-value < 0.001, Constant = 11.615.							

Discussions and Conclusion

The mean depression score for elderly migrants in the study was 2.96 ± 2.72 suggesting that their level of depression was normal. This score is lower than that reported in the Moroccan migrant study by Wu and Levis[30] but is consistent with findings by Wang and Song.[31] The depression level among elderly migrants in China might be underrecognized due to cultural attitudes towards mental health, where psychological issues might be stigmatized or perceived as personal weaknesses. The results suggest that depression among elderly migrants warrants attention, but also suggests a need for a more detailed exploration into the lives of elderly migrants to fully understand the nuances of depression within this group.

Family relationships significantly predicted depression of elderly migrants in Wenzhou. The presence of supportive family relationships can mitigate the impact of potential psychological and biological vulnerabilities, ultimately decreasing the likelihood of depression. The finding is consistent with existing literature that emphasizes the crucial role of family relationships. Zhou et al highlight the mediating role of meaning in life, demonstrating how family care enhances life's meaning, which in turn reduces depression and improves the quality of life among elderly (β = 0.257, P-value < 0.01).[32] Pei et al identify the critical mediating function of social support, showing that living arrangements that include family presence can significantly alleviate depression through the provision of emotional and instrumental support (β = 0.45, P-value < 0.01).[13] Family relationships are deeply influenced by Confucianism which emphasizes filial piety (xiào) as a paramount virtue. Filial piety involves respect for one's parents, elders, and ancestors, and it dictates that children are to honor and care for their parents as they age. In addition, it is important to assess family dynamics when designing mental health interventions for elderly migrants.

The results of this study shows a correlation between self-care and depression among elderly migrants, but self-care did not significantly predict depression in this population in Wenzhou. These findings are consistent with the nuanced and complex results of previous research suggesting that the relationship between self-care and depression among elderly migrants is influenced by a range of factors beyond self-care practices alone.[33,34] It appears that the protective effect of self-care on depression might be moderated by social, economic, and health-related factors, making it a less predictive factor. Theoretically, self-care practices are posited to enhance individual autonomy and control over one's health, potentially reducing depressive symptoms by improving self-efficacy and

personal agency. However, elderly migrants in this study, deeply rooted in traditional Chinese culture, are cared for by their children and also assist in looking after their grandchildren. This shared care responsibility may attenuate the direct impact of self-care on their depression.

This study found that elderly migrants exhibited a high level of social support, which correlated with depression. However, social support did not significantly predict depression among this demographic in Wenzhou. This is consistent with previous research highlighting the complex and multifaceted relationship between social support and depression.[4,9,35] The biopsychosocial model demonstrates that social support interacts with biological and psychological factors to reduce depression by alleviating stress, enhancing self-esteem, and offering coping strategies. It underscores the vital role of robust social networks in both preventing and treating depression. Despite a strong correlation between social support and depression, the predictive power of social support on depression can vary based on factors including the type and context of social support, as well as individual resilience. Different types of social support (emotional, instrumental, informational) and sources (family, friends, community) may have varying impacts on mental health, potentially explaining the lack of significant predictive power for depression observed in this study. The high level of social support among elderly migrants can be attributed to Chinese culture, which emphasizes community resources, local social services, and peer networks within their migrant community. These resources can help mitigate feelings of isolation, provide valuable information and assistance in navigating new environments, and offer emotional and practical support.

This limitation highlights the challenges associated with using self-administered questionnaires in the elderly. The researcher should offer options for assisted completion, use visual aids for easier understanding, and conduct preliminary tests to ensure clarity and ease of use.

In conclusion, the level of depression among elderly migrants in Wenzhou, China, was found to be within normal ranges. There are negative relationships between self-care, family relationships, social support, and depression. Only family relationships could be identified as predictors of depression. This finding is important for nurses, particularly in geriatric and community health settings. The nursing interventions that enhance self-care, strengthen family relationships, and foster better social support for elderly migrants could reduce depression among elderly migrants. Furthermore, the findings suggest the need for future research to thoroughly measure depression and develop community-based mental health services. This could involve collaborative efforts across various healthcare professionals to implement culturally sensitive and effective mental health strategies.

Declaration of competing interest

There is no conflict of interest in this study.

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References

1. Wu, Yu-Tzu, A. Matthew Prina, Linda E. Barnes, Fiona E. Matthews, Carol Brayne, and MRC CFAS. "Relocation at Older Age: Results from the Cognitive Function and Ageing Study." Journal of Public Health 2015;37(3): 480-87.https://doi.org/10.1093/pubmed/fdv050.
2. Wang, H., and H. Chen. "Aging in China: Challenges and Opportunities." [In eng]. China CDC Wkly 2022; 27(4): 601-02. https://doi.org/10.46234/ccdcw2022.130.
3. Wu, R., and L. Wu. "Migration Choices of China's Older Adults and Spatial Patterns Emerging Therefrom (1995-2015)." [In eng]. PLoS One 2023;18(8): e0290570. https://doi.org/10.1371/journal.pone.0290570.
4. Wang, H., Y. Hou, L. Zhang, M. Yang, R. Deng, and J. Yao. "Chinese Elderly Migrants' Loneliness, Anxiety and Depressive Symptoms: The Mediation Effect of Perceived Stress and Resilience." [In eng]. Front Public Health 2022;10: 998532. https://doi.org/10.3389/fpubh.2022.998532.
5. Sundström, G., E. Fransson, B. Malmberg, and A. Davey. "Loneliness among Older Europeans." [In eng]. Eur J Ageing 2009;6(4): 267. https://doi.org/10.1007/s10433-009-0134-8.
6. Cacioppo, J. T., and L. C. Hawkley. "Perceived Social Isolation and Cognition." [In eng]. Trends Cogn Sci 2009;13(10): 447-54. https://doi.org/10.1016/j.tics.2009.06.005.
7. Litwin, H., and S. Shiovitz-Ezra. "Social Network Type and Subjective Well-Being in a National Sample of Older Americans." [In eng]. Gerontologist 2011;51(3): 379-88. https://doi.org/10.1093/geront/gnq094.
8. Bolzman, Claudio, Laure Kaeser, and Etienne Christe. "Transnational Mobilities as a Way of Life among Older Migrants from Southern Europe." Population, Space and Place. 2017; 23(5): e2016. https://doi.org/10.1002/psp.2016.
9. Li, F., et al. "Effects of Sources of Social Support and Resilience on the Mental Health of Different Age Groups During the COVID-19 Pandemic." BMC Psychiatry. 2021; 21(1): 16. https://doi.org/10.1186/s12888-021-03012-1.
10. Cui, Longyan, Ding Ding, Junfeng Chen, Minghui Wang, Fanrong He, and Shiyang Yu. "Factors Affecting the Evolution of Chinese Elderly Depression: A Cross-Sectional Study." BMC Geriatrics. 2022; 22(1): 109. https://doi.org/10.1186/s12877-021-02675-z.

11. Song, Caini, Libo Yao, Huisu Chen, Ying Song, and Lihua Liu. "Prevalence and Factors Influencing Depression among Empty Nesters in China: A Meta-Analysis." BMC Geriatrics. 2023; 23(1): 333. https://doi.org/10.1186/s12877-023-04064-0.
12. Zenebe, Yosef, Baye Akele, Mulugeta W/Selassie, and Mogesie Necho. "Prevalence and Determinants of Depression among Old Age: A Systematic Review and Meta-Analysis." Annals of General Psychiatry. 2021; 20(1): 55. https://doi.org/10.1186/s12991-021-00375-x.
13. Pei, Zhongfei, Fangfang Hu, Wenzhe Qin, Yan Zhao, Xiaohong Zhang, Xinxia Cong, Chuanli Liu, and Lingzhong Xu. "The Relationship between Living Arrangements and Depression among Older Adults in Shandong, China: The Mediating Role of Social Support." Frontiers in Psychiatry. 2022; 13: 896938. https://doi.org/10.3389/fpsyt.2022.896938.
14. Blazer, D. G. "Depression in Late Life: Review and Commentary." J Gerontol A Biol Sci Med Sci. 2003; 58(3): 249-65. https://doi.org/10.1093/gerona/58.3.m249.
15. Cacioppo, J. T., L. C. Hawkley, and R. A. Thisted. "Perceived Social Isolation Makes Me Sad: 5-Year Cross-Lagged Analyses of Loneliness and Depressive Symptomatology in the Chicago Health, Aging, and Social Relations Study." Psychol Aging. 2010; 25(2): 453-63. https://doi.org/10.1037/a0017216.
16. Schuch, F. B., D. Vancampfort, J. Richards, S. Rosenbaum, P. B. Ward, and B. Stubbs. "Exercise as a Treatment for Depression: A Meta-Analysis Adjusting for Publication Bias." J Psychiatr Res. 2016; 77: 42-51. https://doi.org/10.1016/j.jpsychires.2016.02.023.
17. Opie, R. S., A. O'Neil, C. Itsiopoulos, and F. N. Jacka. "The Impact of Whole-of-Diet Interventions on Depression and Anxiety: A Systematic Review of Randomised Controlled Trials." Public Health Nutr. 2015; 18(11): 2074-93. https://doi.org/10.1017/s1368980014002614.
18. Goyal, M., S. Singh, E. M. Sibinga, N. F. Gould, A. Rowland-Seymour, R. Sharma, Z. Berger, et al. "Meditation Programs for Psychological Stress and Well-Being: A Systematic Review and Meta-Analysis." JAMA Intern Med. 2014; 174(3): 357-68. https://doi.org/10.1001/jamainternmed.2013.13018.
19. Silverstein, M., and V. L. Bengtson. "Does Intergenerational Social Support Influence the Psychological Well-Being of Older Parents? The Contingencies of Declining Health and Widowhood." Soc Sci Med. 1994; 38(7): 943-57. https://doi.org/10.1016/0277-9536(94)90427-8.
20. Guo, Yuan-li, and Yan-jin Liu. "Family Functioning and Depression in Primary Caregivers of Stroke Patients in China." International Journal of Nursing Sciences. 2015; 2(2): 184-89. https://doi.org/10.1016/j.ijnss.2015.05.002.
21. Beck, Denise F. Polit and Cheryl Tatano. Nursing Research: Generating and Assessing Evidence for Nursing Practice. 10th ed. Philadelphia: Wolters Kluwer Health, 2017.
22. Yesavage, J. A., T. L. Brink, T. L. Rose, O. Lum, V. Huang, M. Adey, and V. O. Leirer. "Development and Validation of a Geriatric Depression Screening Scale: A Preliminary Report." J Psychiatr Res. 1982; 17(1): 37-49. https://doi.org/10.1016/0022-3956(82)90033-4.
23. Boey, Kamweng. "The Use of Gds-15 among the Older Adults in Beijing." Clinical Gerontologist. 2000; 21(2): 49-60. https://doi.org/10.1300/J018v21n02_05.
24. Guo, L., J. A. Zauszniewski, X. Ding, L. Zhang, H. Gao, Q. Guo, and K. Liu. "The Appraisal of Self-Care Agency Scale-Revised (Asas-R): Reliability and Validity among Older Chinese People." West J Nurs Res. 2017; 39(11): 1459-76. https://doi.org/10.1177/0193945916672821.
25. Sousa, V. D., J. A. Zauszniewski, S. Bergquist-Beringer, C. M. Musil, J. B. Neese, and A. F. Jaber. "Reliability, Validity and Factor Structure of the Appraisal of Self-Care Agency Scale-Revised (Asas-R)." J Eval Clin Pract. 2010; 16(6): 1031-40. https://doi.org/10.1111/j.1365-2753.2009.01242.x.
26. Fok, C. C., J. Allen, and D. Henry. "The Brief Family Relationship Scale: A Brief Measure of the Relationship Dimension in Family Functioning." Assessment. 2014; 21(1): 67-72. https://doi.org/10.1177/1073191111425856.
27. Moos, Rudolf H, and Bernice S Moos. "A Typology of Family Social Environments." Family process. 1976; 15(4): 357-71.
28. Zimet, G.D., et al. "Psychometric Characteristics of the Multidimensional Scale of Perceived Social Support." Journal of Personality Assessment. 1990; 55(3-4): 610-617.
29. Zhang, J., and J. M. Norvilitis. "Measuring Chinese Psychological Well-Being with Western Developed Instruments." J Pers Assess. 2002; 79(3): 492-511. https://doi.org/10.1207/s15327752jpa7903_06.
30. Wu, Yin, Brooke Levis, Ying Sun, Chen He, Ankur Krishnan, Dipika Neupane, Parash Mani Bhandari, et al. "Accuracy of the Hospital Anxiety and Depression Scale Depression Subscale (Hads-D) to Screen for Major Depression: Systematic Review and Individual Participant Data Meta-Analysis." BMJ. 2021; 373: n972. https://doi.org/10.1136/bmj.n972.
31. Wang, W., J. Song, C. Fan, Q. Li, D. Ma, and W. Yin. "Cross-Sectional Study of Factors Affecting the Receipt of Mental Health Education in Older Migrants in China." BMC Public Health. 2023; 23(1): 376. https://doi.org/10.1186/s12889-023-15287-6.
32. Zhou, J. J., Y. Zhang, Q. Z. Ren, T. Li, G. D. Lin, M. Y. Liao, S. H. Chen, P. Tong, and Y. L. Gao. "Mediating Effects of Meaning in Life on the Relationship between Family Care, Depression, and Quality of Life in Chinese Older Adults." Front Public Health. 2023; 11: 1079593. https://doi.org/10.3389/fpubh.2023.1079593.
33. Isik, K., Z. Cengiz, and Z. Doğan. "The Relationship between Self-Care Agency and Depression in Older Adults and Influencing Factors." J Psychosoc Nurs Ment Health Serv. 2020; 58(10): 39-47. https://doi.org/10.3928/02793695-20200817-02.
34. Marin, I. B., D. Fernández, J. L. Ayuso-Mateos, M. Leonardi, B. Tobiasz-Adamczyk, S. Koskinen, A. Sanchez-Niubo, and P. Cristóbal-Narváez. "Healthy Aging and Late-Life Depression in Europe: Does Migration Matter?" Front Med (Lausanne). 2022; 9: 866524. https://doi.org/10.3389/fmed.2022.866524.
35. Doma, H., T. Tran, P. Rioseco, and J. Fisher. "Understanding the Relationship between Social Support and Mental Health of Humanitarian Migrants Resettled in Australia." BMC Public Health. 2022; 22(1): 1739. https://doi.org/10.1186/s12889-022-14082-z.