ORIGINAL ARTICLE

Factors associated with depression among the community-dwelling elderly in Kudat, Malaysia

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ABSTRACT

Introduction: The burden of elderly depression is rising with the growing ageing population, particularly in rural areas with limited healthcare access. In Malaysia, 27.8% of the elderly experience depression, with 16.5% of depressive symptoms reported among community-dwelling older adults. This study aimed to determine the prevalence of depression and its associated factors among the elderly in Kudat, a rural area in Sabah.

Materials and Methods: A cross-sectional study was conducted using the Malay version of the Geriatric Depression Scale (M-GDS-14). Logistic regression analyses were used to analyse the relationships between elderly depression and sociodemographic, socioeconomic, physical health, lifestyle, and psychosocial factors.

Results: A total of 310 participants were involved, with a mean age of 69.4 years. Most were of Rungus ethnicity (78.7%) and married (73.9%). About 72% had a household income below RM 1,000; half were retirees, while 43.2% were still working. The prevalence of depression was high at 73.2% (95% CI: 70.7, 75.7). Comorbidities and moderate-to-poor self-rated health were significantly associated with higher odds of depression, with adjusted odds ratios of 1.99 and 2.09, respectively.

Conclusion: The findings highlight the high level of depression among the elderly in Kudat and the significant association with comorbidities and self-rated health status. Public health programs should focus on managing comorbidities and promoting positive self-perceived health to reduce depression in this population.

KEYWORDS:
Elderly, ageing, older adults, depression, factors of depression, community, rural, Sabah, Malaysia

INTRODUCTION

Malaysia is undergoing a demographic shift, with individuals aged 65 and above increasing from 7.0% in 2021 to 7.3% in 2022.[1] As the elderly population grows, so does the prevalence of mental health issues, particularly depression. Elderly individuals often experience overlapping symptoms of depression and dementia, complicating diagnosis and treatment. Although less common than in younger adults, depression in the elderly has severe consequences, including increased suicide risk, impaired functioning, and a more significant physical illness burden.[2]

In Asia, the prevalence of depressive symptoms among the community-dwelling elderly ranges from 3.7% to 36.7%, with many undiagnosed cases.[3] Urbanisation in Malaysia has surged, with urban populations rising from 50.8% in 1990 to 78% in 2021, affecting healthcare resource distribution. The rural population, which has been ageing since 2020, shows a higher depression prevalence (3.6%) compared to urban areas (1.9%).[4]

Rural Malaysia, home to 7.3 million people, faces significant challenges in accessing mental health care, especially in remote regions like Sabah and Sarawak, where almost half of the rural population (3.1 million) resides.[5] Enhancing mental health treatment in these areas is critical. Studies show varying rural-urban differences in the elderly depression, highlighting the need for improved detection and treatment in primary care settings. Healthcare services will be under strain due to the increasing elderly population, as depression results in a 73% increase in costs compared to those without depression.[6] The importance of primary care screening for needs and providing early therapy must be emphasised. It is the first entry point into the healthcare system and offers the best opportunity to detect illness and initiate care.

This study aims to understand the determinants of depressive symptoms in community-dwelling elderly in Kudat, Sabah. While multiple studies have examined elderly depression risk factors in Malaysia, more research is needed in Sabah's rural context due to its unique socioeconomic and cultural characteristics. Kudat, one of Malaysia's poorest districts, provides a critical context for this research, aiming at tailoring targeted public health measures for this vulnerable population. The study aimed to determine the prevalence of depressive symptoms and major depression among the elderly in Kudat. Specific objectives include identifying significant predictors such as comorbidities, lifestyle habits, and self-rated health status.

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The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) defines a major depressive episode (MDE) as having five or more symptoms, including either a depressed mood or anhedonia, present within two weeks.[7] The Geriatric Depression Scale (GDS) is a widely used tool for screening depression in the elderly, with the GDS-15 being particularly popular due to its simplicity and effectiveness.[8] Despite its advantages, the GDS-15 has limitations, particularly in individuals with severe cognitive impairment whose criterion validity is poor.[9]

The Malay version of the GDS-14 (M-GDS-14) was developed to address the effect of cultural and linguistic differences. This version removes the question "Do you prefer staying at home over going out?" due to its non-discriminatory value in local settings. This yielded optimal cut-off points of 7/8 for major depression and 5/6 for all clinically significant depression. The tool demonstrated a Cronbach's alpha score of 0.84 and a test-retest validity of 0.84.[10]

MATERIALS AND METHODS

Research Design and Subjects

This cross-sectional study is part of the Healthy Ageing in Sabah study by Universiti Malaysia Sabah. Data collection occurred at community settings in Kudat, ensuring accessibility for rural participants. Participants included individuals aged 60 and above who consented to participate, understood Malay and passed cognitive screening using the Abbreviated Mental Test (AMT-10) with score of 7 and above. The Kish Formula was used to calculate the adequate sample size for this study based on the prevalence of depression among the Malaysian elderly, which was 27.8% (3), resulting in a calculated sample size of 310.[3]

Data Collection

Data were collected by trained personnel either by interviewer-assisted method or self-administered questionnaires.

Instruments Used

The study employed the Abbreviated Mental Test (AMT) to screen participants for cognitive function prior to inclusion. The AMT-10 is a validated and widely used tool to assess cognitive impairment, consisting of ten questions that evaluate orientation, memory, and attention. Participants were required to achieve a score of 7 or higher to ensure sufficient cognitive capacity for understanding and responding accurately to the study instruments.[11]

Additionally, the study used the Malay-validated GDS-14 to assess depressive symptoms, alongside other instruments evaluating sociodemographic, lifestyle, and health-related factors. The M-GDS-14 utilised a cut-off score of 6 or above to detect clinically significant depression and score of 8 or above to detect severe depression.[10] The study participants were instructed to indicate their feelings by answering 14 questionnaire items with a simple 'yes' or 'no' response.

The sociodemographic aspects included age, sex, religion, ethnicity, and marital status. The socioeconomic aspects encompassed income status and employment status. The lifestyle aspects were assessed by examining smoking habits, alcohol consumption, and the presence of hobbies. Morbidity was evaluated through the presence of hypertension, while self-rated health and loneliness were also measured.

Loneliness was assessed by asking the respondents the frequency with which they lacked companionship, were left out, or were isolated from others, using a 3-point Likert scale coded from 1 'hardly ever' to 3 'often.' The loneliness scale ranged from 3 to 9, with higher scores indicating greater loneliness. This study categorised loneliness as low (scores 3 to 5) or high (scores 6 to 9), consistent with previous research, which also used a cut-off of 6.[12] Additionally, the living arrangements of the respondents were recorded.

Activities of daily living (ADL) status was evaluated based on six parameters: bathing, dressing, going to the toilet, transferring, feeding, and continence. For the physical and mental examination, height, weight, and depression scores were considered. BMI was calculated using the measured height and weight values by dividing body weight (in kilograms) by height (in meters) squared. BMI was categorised per WHO standards for Asians: underweight (<18.5 kg/m²), normal (18.5–22.9 kg/m²) and overweight (≥23 kg/m²).[13]

Self-rated health status was determined based on participants' responses to a single-item question: "How would you rate your current health?" Participants could choose from a 4-point Likert scale: 1 = Very Good, 2 = Good, 3 = Moderate, and 4 = Poor. Responses of Moderate (3) and Poor (4) were grouped together as "moderate to poor" health status. This categorisation reflects participants' subjective perceptions of their health and while this approach provides valuable insights, the subjective nature of self-rated health may limit reproducibility in different contexts.

Ethical Consideration

Ethical approval was obtained from the Research and Ethics Committee of Universiti Malaysia Sabah (UMS), with the approval code of JKEtika 2/23 (6).

Informed written consent was obtained from the study participants before filling out the questionnaire and participant confidentiality was assured. Any participants who had an abnormal status of depression (scoring of 6 and above) during the survey were referred to the nearest health clinic for follow-up.

Statistical Analysis

Raw data collected was recorded into tables in Microsoft Excel 2019 before being cleaned and categorised accordingly. The data were then analysed using the IBM SPSS Version 28.0, the statistical significance of which was a p-value lower than 0.05.

Mean and standard deviation were used for continuous data, while number and percentage were used to describe the distribution of the categorical data. Simple and multiple logistic regression analyses were used to determine the association between independent and dependent variables and the factors associated with depression.

Table I: Sociodemographic data, lifestyle habits, health status and social behaviours of the respondents (n = 310)

Variables	n (%)
Age	69.4 ± 7.00a
60–69	180 (58.1%)
70–79	98 (31.6%)
≥80	32 (10.3%)
Sex	
Men	149 (48.1%)
Women	161 (51.9%)
Ethnicity	
Rungus	244 (78.7%)
Bajau/Suluk	34 (11.0%)
Others	32 (10.3%)
Marital status	
Married	229 (73.9%)
Widow & Divorce & Single	81 (26.1%)
Total Household Income Level (RM)	
0 – 999	222 (71.6%)
1000 – 1999	63 (20.3%)
>2000	25 (8.1%)
Smoking Status	
Active Smoker	51 (16.5%)
Ex-smoker	63 (20.3%)
Never Smoke	196 (63.2%)
Alcohol Status	
Active Drinker	56 (18.1%)
Ex-drinker	116 (37.4%)
Never Drink	138 (44.5%)
Comorbidity	
Yes	205 (66.1%)
No	105 (33.9%)
Body Mass Index (BMI)	
Underweight	42 (13.5%)
Normal	101 (32.6%)
Overweight	167 (53.9%)
ADL status	
independent	305 (98.4%)
dependent	5 (1.6%)
Self-rated health status	
Poor	22 (7.1%)
Moderate	127 (41.0%)
Good	161 (51.9%)
Presence of hobby	
Yes	52 (16.8%)
No	258 (83.2%)
Loneliness	
Yes	17 (5.5%)
No	293 (94.5%)
Living arrangement	
alone	25 (8.1%)
with spouse only	73 (23.5%)
with family members	212 (8.4%)

[a] Mean ± standard deviation

All variables with a p-value of less than 0.25 were included for multivariable analysis.[14] They were analysed using backward and forward methods of likelihood ratio in SPSS to get the preliminary model of predictors for depression.[15] The assumptions were subjected to further checking using the Hosmer and Lemeshow Test. The model was determined to be fit for the data if the p-value was not statistically significant.

RESULTS

The Prevalence of Depression

The prevalence of depression among older people in Kudat, as screened using M-GDS-14, was 73.2% (95% CI= 70.7-75.7) %, with 36.1% (112 participants) classified as having severe depression, defined as a GDS-14 score of 8 and above. Out of the total 310 respondents, 26.8% were classified as having no depression symptoms (95% CI= 24.3-29.3).

The Respondents' Demographics

Table I demonstrates the respondents' demographics. The mean age of the participants was 69.4 ± 7.00, ranging from 60 to 94 years. Most of the respondents are from Rungus ethnicity and are married, with a percentage of 78.7% and 73.9%, respectively. Seventy-one percent have a cumulative total household income of less than RM 1,000, and only 8% have more than RM 2,000. For employment status, half were

Table II: Simple logistic regression of sociodemographic factors, lifestyle habits, health status and social behaviours associated with depression among the elderly in Kudat

Variables	Depression (%)	Crude OR (95% CI)	p-value
Age			
60–69	126 (70.0%)	ref	
70–79	77 (78.6%)	1.57 (0.88-2.80)	0.126
≥80	24 (75.0%)	1.29 (0.54-3.04)	0.567
Sex			
Men	103 (69.1%)	ref	
Women	124 (77.0%)	1.50 (0.90-2.48)	0.118
Total Household Income Level (RM)			
1000 and above	67 (76.1%)	ref	
0 – 999	160 (72.1%)	1.00 (0.48-2.11)	0.993
Smoking Status			
Never Smoke	147 (75%)	ref	
Active Smoker	37 (72.5%)	0.88 (0.44-1.77)	0.721
Ex-smoker	43 (68.3%)	0.72 (0.39-1.33)	0.293
Alcohol Status			
Never Drink	98 (71.0%)	ref	
Active Drinker	36 (64.3%)	0.74 (0.38-1.42)	0.359
Ex-drinker	93 (80.2%)	1.65 (0.92-2.97)	0.094
Comorbidity			
No	66 (62.9%)	ref	
Yes	161 (78.5%)	2.16 (1.29-3.63)	0.003
Body Mass Index (BMI)			
Normal	66 (65.3%)	ref	
Underweight	32 (76.2%)	1.70 (0.75-3.85)	0.206
Overweight	129 (77.2%)	1.80 (1.04-3.11)	0.035
ADL status			
independent	223 (73.1%)	ref	
dependent	4 (80.0%)	1.47 (0.16-13.35)	0.732
Self-rated health status			
Good	106 (65.8%)	ref	
Moderate-Poor	121 (81.8%)	2.24 (1.33-3.79)	0.003
Presence of hobby			
Yes	36 (69.2%)	ref	
No	191 (74%)	1.27 (0.66-2.43)	0.476
Loneliness			
Yes	213 (72.7%)	ref	
No	14 (82.4%)	1.75 (0.49-6.26)	0.388
Living arrangement			
with family members	156 (73.6%)	ref	
alone	21 (84.0%)	1.89 (0.62-5.73)	0.264
with spouse only	50 (68.5%)	0.78 (0.44-1.40)	0.403

retirees, 43.2% were still working, and only 6.8% were unemployed.

Most of them denied smoking (63.2%); only 16.5% were active smokers, while the rest were ex-smokers. Forty-four percent denied drinking alcohol, 37.4% had quit drinking, and only 18.1% were active drinkers. Regarding the health status, most respondents suffer from at least one comorbid illness (66.1%). The survey found that only 5 out of the 310 respondents were ADL-dependent. Regarding BMI status, one-third of the respondents have a normal BMI; more than the majority (51.3%) reported being overweight, and only 13.5% had a BMI of less than 18. Only 7.1% reported poor health status, 41.0% were moderate, and most (51.9%) reported good health. The presence of hobbies, loneliness, and living arrangements were grouped into the social behaviours of the respondents. Most of them had no hobbies (83.2%) and denied feelings of loneliness (94.5%). Only 8% lived alone, 68.4% lived with family members, and 23.5% lived with their spouse.

A simple logistic regression was conducted to determine the sociodemographic variables associated with depression. Taking a p-value of less than 0.05, this study found no significant relationship between sociodemographic, lifestyle and elderly depression. The presence of comorbidity, overweight and moderate to poor self-rated health status are significant predictor variables related to depression. The elderly with comorbidity have more than twice the odds of having depression (crude OR: 2.16, 95% CI: 1.29-3.63). Those who are overweight have an 80% increase in odds of developing elderly depression (crude OR: 1.80, 95% CI: 1.042-3.110). Those who reported moderate to severe health status are also likely to have depression with an odd of more than twice (crude OR: 2.24, 95% CI: 1.33-3.79). For social behaviours associated with depression, the findings noted that the absence of hobbies, feelings of loneliness and living arrangements had no significant relationship with depression among the elderly.

Table III: Factors associated with depression among elderly in Kudat on multivariable logistic regression analysis

Variables	Adjusted OR (95% CI)	p-value
Comorbidity		
No	ref	
Yes	2.00 (1.18-3.38)	0.010
Self-rated health status		
Good	ref	
Moderate-Poor	2.09 (1.23-3.55)	0.007

Age, sex, employment status, alcohol status, comorbidity, BMI, and perception of health status were significant variables (when taken as a p-value of less than 0.25) to be included in the multiple logistics regression model.[14] Using forward method Likelihood Ratio statistics, the presence of comorbidity and self-rated health status were found to be significant predictor variables. The model generated had a Hasmer and Lameshow test of 0.280 and Nagelkerke R square score of 0.128. The elderly with comorbidity have almost twice the odds of having depression (aOR: 1.99, 95%: 1.17, 3.37). Moderate to poor self-rated health status is also likely to have elderly depression with an odd of 2 (aOR: 2.09, 95%: 1.23, 3.55).

DISCUSSION

The Prevalence Of Elderly Depression

The prevalence of depression among the Malaysian elderly was shown to be 27.8%, while the prevalence of depressive symptoms among community-dwelling older adults in Malaysia is 16.5%.[3,16] The findings of this study highlight a high prevalence of depressive symptoms (73.2%) among the elderly in Kudat, with 112 participants (36.1%) meeting the criteria for severe depression, defined as a GDS-14 score of 8 and above. A meta-analysis found that the pooled prevalence of depression among older adults globally was 31.74%. The study ranges from 7.7% in Malaysia and Australia to 81.1% in India.[17] The prevalence of depression among the elderly is similarly high in Asia. A study done in urban Vietnam, for example, revealed that depression is more prevalent in 66.89% of the elderly.[18]

There was significant prevalence heterogeneity between the screening tools, likely due to the different levels of sensitivity and specificity of the screening tools. This may be partly due to the questionnaire tool used in this research, which utilised a 14-item version of GDS. Other different types of scales can be used to screen for depression in the elderly population, like the Patient Health Questionnaire (PHQ), Hamilton Depression Rating Scale (HDRS), Beck Depression Inventory (BDI), Center for Epidemiologic Studies-Depression Scale (CES-D) and Cornell Scale for Depression in Dementia. Another possibility for high prevalence could be due to the high sensitivity of GDS that was used as a screening tool for depression.[10] Apart from that, the small size of this study yielded a higher prevalence of depression, as evidenced in a meta-analysis done on the prevalence of depression.[17] The proportion of depression in the elderly with Type 2 DM attending the Klinik Kesihatan Bandar, Sungai Petani, Kedah was 32.1%.[19], whereas those in Asajaya, Samarahan, Sarawak recorded a prevalence of 65.1%.[20] The prevalence of depression among the elderly in the community area of Felda Gunung Besaut 2 is the highest at 85.5%.[21] In comparison, the prevalence of elderly depression attending the outpatient clinic at Universiti Sains Malaysia Hospital was the lowest at 13.9%.[22] All of these studies used the same screening instruments, M-GDS 14.

The considerable difference between prevalence in our study compared to others, particularly in Malaysia, signifies the healthcare gap and unmet need for the rural communities in Sabah to manage health problems. The social disparity in the rural region is contributed to by low socioeconomic conditions, high unemployment, and limited access to health and digital technology. In 2022, Malaysia's projected target for the doctor-to-population ratio was 1:425. However, the ratio in Sabah is among the lowest at 1:872.[23]

More dire is the imbalance of mental health professionals density; for example, the psychiatrist-to-population ratio in Sabah in 2018 was 0.54 psychiatrists per 100,000 compared to Kuala Lumpur, which had 5.24 psychiatrists per 100,000 population.[24] The accessibility to these health professions is further limited because only 50% of them serve in the Ministry of Health, and the rest are either in other ministries (Ministry of Higher Education or Ministry of Defence) or private clinical practices and universities. The need for mental health professionals is paramount as the psychiatrist-to-population ratio was still the lowest in Sabah, despite an improvement from 0.30 to 0.54 psychiatrists per 100,000 population.[25]

Based on data released by the Malaysian Department of Statistics, the number of households in Sabah that reside less than five kilometres from public health centres increased from 74% in 2016 to 84% in 2019.[26] Though access to primary healthcare facilities in Sabah have been improving, the geographical landscape of other areas such as Kudat and its infrastructure facilities for example transportation, need to be addressed for rural populations.27

Not to mention, the health literacy rate is still worrying. Based on the National Health Morbidity Survey (NHMS) 2019, 24.3% had excellent health literacy, 40.7% possessed sufficient health literacy, and 35.0% possessed limited health literacy. Significantly, 43.2% of the Sabahans had a limited health literacy level, the highest prevalence among the other states.[28] Because of this, they are more prone to seek alternative care through religious or traditional methods, which can delay the diagnosis and proper treatment of mental disorders.

Those who are older, have a lower educational level, have a lower income and have a low unemployment status were

linked to low health literacy.[29] The digital divide in Sabah, made worse by social inequity, is more prominently affecting the elderly's adoption of technology in their daily activities. Low socioeconomic status, involving income, education, and social skills, limits resources for obtaining information beyond healthcare providers. This issue is more pronounced in rural communities due to social disparities. Limited internet access and difficulty reaching primary health care services result in poor health maintenance, delayed diagnosis, and disease progression.

Significant Factors And Elderly Depression

The findings of this study found that the presence of comorbidity and moderate to poor self-perception of health are predictive factors for depression in Kudat at a 5% level of significance. Owing to their age and degenerative body functions, they are also prone to chronic pain. If poorly managed, subsequent complications could lead to the impairment of performing daily activities and the development of depressive symptoms.[22] This study only dichotomised the presence of comorbidity into yes or no and did not consider the number or type of medical illnesses. Even with this limitation, the finding is still significant, proving that the presence of comorbidity increases the odds of having depression in the elderly, regardless of the severity.

In this study, having poor or moderate self-perception of health status is one of the risk factors for mild to severe depression. Studies conducted in Malaysia, specifically among institutionalised elderly in Sabah[30] and rural Malaysia [20,31] highlighted these significant findings. Self-reported health status is one of the elements linked with self-efficacy, a vital feature in the elderly since higher self-efficacy levels are connected with excellent perceived health and decreased depressive symptoms.[32] This association is supported by a meta-analysis done to determine the relationship between health status, including self-rated health status and chronic disease, and depression risk among the elderly. Interestingly, the study indicated that poor self-reported health status appeared to be more significantly related to depression than the occurrence of chronic disease, which is a similar finding to this study.[33]

Though this variable is subjective to respondents' perceptions, rating one's health as poor or fair, especially among those with recent experience of depressive symptoms, may differentiate a subgroup of patients with complex and difficult-to-treat forms of depression complicated by physical ill-health and social disadvantage. Some studies also note that self-reporting of poor health is a significant indicator due to the high frequency of chronic conditions and depressive symptoms in older adults.[32] Collaborative care models, such as the Program for Active and Healthy Ageing Pusat Aktiviti Warga Emas (PAWE) in Sabah, demonstrate the potential for addressing the mental health needs of older adults.[34] Community mental health services, when combined with initiatives like PAWE, offer holistic support tailored to the multifaceted needs of older adults. Beyond mental health care, PAWE also promotes social support and community engagement, which are crucial for improving the quality of life for older adults. Expanding PAWE's reach in rural areas like Kudat can significantly reduce depression symptoms and its long-term effects.

CONCLUSION

The study demonstrates that elderly depression in Kudat is relatively higher compared to national prevalence and warrants early management. As many studies emphasised the association of various adverse health outcomes with depression, screening for early detections and variation of intervention programs for the elderly population must be emphasised. This is crucial, especially in rural areas, because early detection of community diseases depends on primary health facilities. The result of this study concluded that those with comorbidities or moderate to poor self-rated health status are more likely to have elderly depression.

By understanding the specific factors contributing to depression, interventions and strategies can be designed to mitigate the risk and promote mental well-being among the elderly population. These interventions may include targeted social support programs, improved healthcare accessibility, mental health awareness campaigns, and culturally sensitive approaches. Information regarding depression and the availability of effective treatments for depression should be made available to the elderly themselves. Overall, the research on factors associated with elderly depression in Kudat contributes to the existing knowledge base on geriatric mental health and highlights the importance of addressing the unique challenges faced by the elderly population in this region.

Recommendations

Further research is needed to understand the specific mechanisms and causal relationships between these factors and elderly depression in Kudat. Longitudinal studies and more robust study designs, like extensive sampling methods, can provide additional insights into these relationships' temporal and contextual dynamics. In an effort to ascertain potential interventions that may alleviate depressive symptoms in this demographic, additional research should investigate protective factors, including family cohesion, social support, and community engagement.

Strength

To our knowledge, this is the first study to investigate the prevalence of depression and its associated factors among the elderly in the rural area of Kudat, Sabah. The multi-stage sampling used in this study represented Sabah, at least in the rural part of the state. Another strength of this study is using locally trained enumerators for data collection.

Limitation

This study has several limitations, mainly related to its cross-sectional nature. Due to this, the temporality of the association between some of the variables studied in this study cannot be established.

A questionnaire was used for data collection, subjecting the study to self-report bias, leading to recall bias or social desirability bias, which can subsequently affect the accuracy and reliability of the responses. Although the study used Malay-validated GDS-14, future studies should consider using the local dialect spoken by the elderly in Kudat as the population comprises multiple ethnicities with diverse languages and cultures. As there could be some language barrier, the data were not well captured.

The study focused on hypertension and self-rated health as predictors of depression, omitting other critical factors such as diabetes, cardiovascular disease, and mental health history. These conditions are strongly associated with depression in the elderly, and their exclusion may limit the comprehensiveness of the findings. Future studies should incorporate these variables to provide a more holistic understanding of the factors influencing depression.

Other risk factors, such as stressful life events and grief should have been investigated in this study. Protective factors of depression in the elderly, like social support and family dynamics, were also not collected and should be included in future research.

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