

Factors influencing the risks of depression among urban elderly people in Phitsanulok Province, Thailand

Kridanai Srijai^{1,2}, Pramote Wongsawat¹

¹ Faculty of Public Health, Naresuan University, Phitsanulok, Thailand

² Sirindhorn College of Public Health Phitsanulok, Faculty of Public Health and Allied Health Sciences, Praboromarajchanok Institute, Thailand

Corresponding Author: Kridanai Srijai **Email:** kridanai.s@scphpl.ac.th

Received: 21 June 2023 **Revised:** 15 August 2023 **Accepted:** 16 August 2023 **Available online:** September 2023

DOI: 10.55131/jphd/2023/210314

ABSTRACT

Depression poses a significant and widespread issue in numerous countries and is capable of inflicting severe hardships if left untreated. However, there remains limited understanding regarding the influential factors contributing to the risk of depression among elderly individuals residing in urban areas of Thailand. Thus, this study employed a cross-sectional descriptive research approach. The research involved 735 elderly participants residing in urban regions of Phitsanulok Province, Thailand, selected through stratified sampling. Data collection included interviews, with subsequent analysis incorporating percentage calculations, means, standard deviation, and binary logistic regression analysis. Findings revealed several risk factors associated with depression among urban elderly individuals, encompassing single status, dietary inadequacy, a close relative with the history of depression, low self-esteem, and low social support. Collectively, these factors predict a 57.90% risk of depression among urban elderly individuals, with a predictive accuracy rate of 97.40%. The study outcomes provide relevant agencies with valuable insights for monitoring and safeguarding urban elderly populations against the risk of depression, with potential applications in other contexts as deemed appropriate.

Key words:

risks of depression; elderly people; urban; Thailand

Citation:

Kridanai Srijai, Pramote Wongsawat. Factors influencing the risks of depression among urban elderly people in Phitsanulok Province, Thailand. J Public Hlth Dev. 2023;21(3):181-191 (<https://doi.org/10.55131/jphd/2023/210314>)

INTRODUCTION

Depression is a prevalent mental illness that has profound effects on the elderly population, affecting not only the afflicted persons but also their families and communities. If left untreated or undiagnosed, depression can manifest in more severe forms, persist for extended periods, and result in negative outcomes such as impaired physical and mental health, diminished socioeconomic opportunities, and even suicide.¹⁻³ Depression in the elderly is a multifaceted condition influenced by a variety of factors, such as psychological trauma resulting from traumatic events and a lack of familial support. Moreover, genetic predispositions and the presence of physical ailments contribute to the development of depression in older individuals; physical deterioration, chronic diseases, changes in social status, and a decline in social responsibilities are major contributors to depressive symptoms in the elderly⁴. These factors frequently lead to functional impairments, resulting in difficulties with daily activities such as personal hygiene neglect, loss of appetite, decreased interest in engaging in activities, decreased verbal communication, self-imposed isolation, and decreased social interactions with household members and others. Importantly, elderly individuals who are economically and medically dependent are more susceptible to depression than the general elderly population, and this susceptibility is anticipated to increase by 36.16 percent by 2030.²

The global population is experiencing a rapid increase in the number of elderly people, a trend that is especially evident in Thailand. The prevalence of depression among the elderly is anticipated to increase as societies age.⁵ Numerous risk factors, including gender disparities, educational backgrounds, and shifting social roles, contribute to this trend. In addition, self-perception of health status,

maladaptive health behaviors, and other individual characteristics contribute to the risk of depression.⁶ Specifically, urban elderly populations face particular factors that contribute to a higher incidence of depression, including socioeconomic status, the presence of underlying health conditions,⁷⁻⁸ individual personality traits,⁹⁻¹⁰ income levels,^{7, 11-12} living arrangements without a caregiver,¹³ and inadequate social support,⁸⁻¹¹ among others.

Thailand has established a comprehensive provincial depression surveillance system with the intention of reducing the prevalence of such debilitating conditions. Various measures, including social media and other media-based targeted awareness campaigns, have been implemented to address this public health issue. Utilizing a concise and efficient two-question screening form (2Q), surveillance efforts concentrate on identifying populations at high risk for depression. Recognizing the vulnerability of the geriatric population, comprehensive and continuous screening measures for this age group are prioritized.¹⁴

However, despite efforts to provide comprehensive care through public health facilities, a significant portion of the population has not been screened using the 2-question screening procedure (2Q). In 2019, the screening rate in the province of Phitsanulok's Regional Health Zone 2 reached 75.97%, with the screening rate at 69.51% and the risk of depression was 0.19% observed in urban areas, these findings were lower than expected because the screening does not cover the targeted elderly population.¹⁵ This is in accordance with mental health care policies and the preventive surveillance of depression issues among the elderly.¹⁶ The objective of this study is to determine the factors that influence the risk of depression among urban elderly individuals and to provide insights for relevant public health agencies and municipalities, enabling them to use the

findings to formulate effective operational guidelines targeting at-risk populations and specific geographic regions. By implementing proactive measures to prevent depression prior to its onset and to reduce its incidence and consequences, the overall quality of life of the geriatric population can be significantly enhanced.

METHODS

This descriptive cross-sectional study was conducted as an important part of a larger project titled "A protection model for risks of depression among urban elderly people". The study was considered and approved by the Naresuan University Institutional Review Board by using the expedited review method (COA No. 129/2021, IRB No. P3-0024/2564).

Population and samples

The study's target population consisted of 32,100 senior citizens residing in the sub-district municipality of Phitsanulok Province, Thailand.¹⁵ The sample size of 735 participants was determined using the formula for estimating proportions of the population.¹⁷ To guarantee a representative sample and ensure that it accurately reflected the diversity and characteristics of the urban elderly population in Phitsanulok Province, the researchers utilized a stratified random sampling technique. The stratification method was used to randomize sub-districts municipality grouped by depression incidence rates.; high, medium, and low level. One sub-district municipality of each group was selected randomly. The subjects in each selected sub-districts municipality were randomly selected by systematic random sampling until a total of 735 subjects were sampled, while the proportion of the participants used as a sample in each group was proportional to the original ratio. Elderly individuals

diagnosed with depression were excluded from this study.

Research instruments and qualification

This study's research instrument was meticulously developed by the researchers, who drew on insights from a comprehensive literature review and prior research in the field. A comprehensive structured interview form was utilized to identify the risk factors associated with depression in urban seniors. This interview form was methodically divided into five distinct sections, each of which served a distinct purpose in capturing pertinent data and information. Using this well-designed research instrument, the study sought to investigate and comprehend the numerous factors that contribute to depression among the urban elderly population.

Part 1: Personal factors consisting of gender, marital status, educational level, and occupation were in the form of multiple-choice; age was in the form of fill-in-the blank; personal personality and health behaviors were in the form of a practice rating scale with 5 levels: *always, often, sometimes, seldom, and never*.

Part 2: Physical factors consisting of chronic diseases, disabilities, and genetics were in the form of multiple-choice and fill-in-the blank; Barthel activities of daily living (Barthel ADL)¹⁸ were in the form of multiple-choice, and the resulting scores were interpreted in 3 levels: total dependence (0–4 points), moderately severe and severe dependence (5–11 points), and mildly dependence and normal group (12 points or more).

Part 3: Psychological factors consisted of self-esteem, self-awareness of health, and mental event awareness. The interview items were in the form of an awareness rating scale with 5 levels: *most, much, moderate, little, and least*.

Part 4: Economic and social factors consisting of income, family status and

roles, social status and roles, and social support were in the form of multiple-choice, fill-in-the blank, and rating scales with 5 levels: *most, much, moderate, little, and least*.

Regarding the rating scale scoring criteria in part 1, part 3, and part 4, each positive item was given 5, 4, 3, 2, and 1, respectively, whereas each negative item was given 1, 2, 3, 4, and 5, respectively. The scores were interpreted at 3 levels¹⁹: a high level at 3.67–5.00, a moderate level at 2.34–3.66, and a low level at 1.00–2.33.

Part 5: Assessment of the Risks of Depression with 2Q from the Department of Mental Health²⁰ consisted of the feelings that happened 2 weeks ago to date. Two items are: 1) Are you feeling depressed, sad, discouraged, or hopeless? 2) Are you feeling bored and not enjoying doing anything? Questions were Yes-No questions. The scores were interpreted in two groups: those who replied that they did not have both feelings were interpreted as being normal or not at risk of depression. If one or both feelings are present, it is interpreted as the person being at risk of depression.

This research instrument was reviewed for content validity by five experts, analyzed with the Index of Item: Objective Congruence (IOC), and accepted at 0.5 or higher.²¹ Then, it was tested with 30 elderly individuals, who have non-sample characteristics and similar characteristics to the samples. The analysis was performed by Cronbach's alpha coefficient and accepted at 0.70 or higher.²² In the analysis results of the interview form in this research, personal personality was 0.844, health behavior was 0.704, self-worth was 0.812, self-health was 0.712, emotional events were 0.712, and social support was 0.833. The analytical result was considered reliable and acceptable.

Data collection

For the data collection method, the researchers submitted a request from

Naresuan University to the local service units for permission to collect data from the samples. An interview form was used to collect data. The researcher and assistant conducted volunteer interviews clarifying the details and requesting research consent to participate in the study. The data from 735 people was collected completely. The participants data were not disclosed individually in this study to prevent any possible impact on the informants. Then, the researchers inspected the data for completion and accuracy before being used for data analysis.

Data analysis

The sample data analysis was done according to the study assumptions by using statistical computer programs. Data were analyzed for personal factors, physical factors, psychological factors, economic and social factors, along with an assessment of the risk of depression with 2Q. Descriptive statistics were used to calculate percentages, means, standard deviations, minimum values, and maximum values. Factors influencing the risk of depression among urban elderly people were analyzed with binary logistic regression. Statistical significance was determined at 0.05 as the criteria for hypothesis acceptance.

RESULTS

Personal factors

The study's participants were mostly female, accounting for 66.94% of the informants. The participants' average age was 71 years, with a standard deviation of 7.68. A significant number of the informants, 46.94%, were between the ages of 60 and 69 years. The marital status distribution revealed that the majority of participants (57.15%) were married. In terms of educational achievement, the highest number (73.88%) had completed primary school. In terms of occupation, the vast majority of individuals (43.67%) were unemployed. When personality qualities

were assessed, the likelihood of depression was generally modest (55.10%). Participants who struggled to manage their emotions, on the other hand, were the highest-risk group, accounting for 71.00% of the sample. In terms of health behaviors, a large proportion of individuals (47.10%) did not engage in regular exercise (less than 3 days per week, not less than 30 minutes each time). Furthermore, a lower proportion (12.50%) reported not engaging in activities such as meditation or prayer to calm the mind, as well as not engaging in hobbies or relaxation activities (6.70%), having an inadequate diet (less than 3 meals per day) (3.10%) and, the lowest proportion, reported having insufficient rest and sleep (less than 7 hours per day) (3.00%).

Physical factors

75.24 percent of the participants in this study reported having a chronic disease, which is a significant majority. Only 4.35 percent of the informants reported having a disability, which is a relatively low prevalence. A modest proportion of the sample, 2.04 percent, had a close relative with depression, suggesting a familial influence on mental health outcomes. The assessment of activities of daily living (ADL), as assessed by the Barthel ADL scale, revealed that the majority of participants (98.10%) exhibited moderate reliance. A smaller percentage (1.63%) demonstrated moderately severe dependence, indicating a greater need for assistance with daily activities. Only a negligible percentage of participants (0.27%) exhibited total dependence, indicating a greater degree of reliance on others to complete daily tasks.

Psychological factors

The study revealed that among the participants, a significant number had moderate self-esteem (62.40%). In

addition, the vast majority reported experiencing intense dread or anxiety that hindered their ability to engage in activities (93.10%), followed by a feelings of satisfaction with their own life (92.90%), a feeling of esteem for others (92.70%), acceptance of the opinions or actions of others (91.90%), and feeling of contributing to the community and society (91.50%). while a sizeable proportion demonstrated leadership qualities (76.40%). In terms of health self-awareness, the majority of participants demonstrated a moderate level (84.20%). In addition, self-care behaviors and sentiments of being unconcerned about one's health were most frequently reported as moderate (91.20% and 72.30%, respectively). The majority of individuals reported moderate levels of mental event awareness (80.30%). In addition, a significant proportion felt present tedium relative to the past (90.90%), and a sizeable proportion did not experience grief upon the loss of loved ones (61.40%).

Economic and Social factors

The majority of participants had an average monthly income of 5,509 baht, with a significant proportion (29.80%) lying within the range of 1,500–3,000 baht. The government was the primary source of income (91.70%). Nevertheless, a sizeable proportion of participants reported insufficient income (20.27%), debt (17.69%), lack of financial assistance (34.92%), and financial concern (60.68%). The majority of individuals resided in their own residences (83.40%). Participants had an average of three family members ($SD = 1.63$). In terms of family roles, the majority of respondents identified as family members (48.16%). 6.94 percent of participants reported experiencing relationship issues such as quarrels, conflicts, and other problems. High levels of active participation in family decision-

making (45.71%) and participation in family activities (45.17%) were reported. Also observed was that 7.35 percent of participants did not have a caregiver when they were ill. In terms of social status and role, the majority identified as community members (73.33%), participated actively in community activities (60.54%), and did not have any conflicts with others (97.82%). The majority of respondents (51.29%) rated the level of social support as moderate; accessing health services in a timely and expedient manner (93.10%) was the common form of support, followed by receiving help when problems arise (89.20%), and being taken care for mental health problems (77.40%). 69.70 percent of respondents, however reported obtaining desired or necessary items, participating in community-organized recreational activities (65.70%), and availability of community parks for recreation (51.50%).

Risk of depression (Assessment with 2Q)

Using the depression risk screening form (2Q), it was determined that 4.40 percent of the participants were at risk for depression. 3.30% of participants in the risk group fell into the 1-point category, while 1.10 % fell into the 2-point category. The remaining 95.60 percent were normal.

Factors influencing for risk of depression among the urban elderly people

Using binary logistic regression statistics with the Enter method, the risk

factors influencing depression among urban elderly individuals were extensively analyzed. This method required the selection of independent variables for inclusion in a one-step logistic regression equation. There was a Goodness of fit test of the logistic regression; 1) not multicollinearity, 2) omnibus test of model coefficients, Chi-square, in step, block, and model were equal (140.832) and p-value < 0.001 and 3) Hosmer and Lemeshow, Chi-square, was 9.468 and p-value = 0.304. The research findings revealed a number of significant correlations: 1) Individuals with a single status faced a 16.19 times higher risk of depression compared to those who were married; 2) Those who were widowed, divorced, or separated had a 12.98 times higher risk of depression compared to their married counterparts; 3) Inadequate diet was associated with a 27.22 times higher risk of depression compared to those with a sufficient diet; 4) Insufficient rest and sleep were linked to an 8.44 times higher risk of depression compared to those with sufficient rest. Moreover, elderly individuals with low self-esteem had a 62.14-fold greater risk of depression than those with high self-esteem, while those with low social support had a 13.07-fold greater risk. Significantly, when taken together, these factors were able to predict the risk of depression among urban seniors with a 57.90% degree of accuracy. Table 1 below provides the details.

Table 1. The binary logistic regression analysis between the predictors and the risk of depression among the urban elderly people (n=735)

Predictors	B	Adj.OR	95% CI Lower-Upper	p-value
marital status				
married (ref.)				
single	2.79	16.19	1.78-147.60	0.014
widowed, divorced, separated.	2.56	12.98	2.25-75.06	0.004
inadequate diet				
enough (ref.)				
not enough	3.30	27.22	3.20-231.62	0.002

Predictors	B	Adj.OR	95% CI Lower-Upper	p-value
insufficient rest and sleep enough (ref.)				
not enough	2.13	8.44	1.17-60.90	0.034
close relative with depression no (ref.)				
yes	3.38	29.28	1.82-471.11	0.017
self esteem high (ref.)				
low	4.13	62.14	1.92-2011.10	0.020
moderate	-0.14	0.87	0.19-4.07	0.862
social support high (ref.)				
low	2.57	13.07	1.46-117.24	0.022
moderate	1.84	6.31	0.49-80.91	0.157

Percentage correct=97.40%, Nagelkerke $R^2=0.579$

DISCUSSION

The objective of this study was to investigate the intricate factors that contribute to the risk of depression among urban elderly people residing in Regional Health Zone 2 of Phitsanulok Province. This area found the risk of depression in elderly at 4.40 percent, higher than Phitsanulok Province at 0.19 percent due to comprehensive screening of the population.¹⁵ This study emphasizing the urgency and significance of understanding the underlying causes and associated factors of this mental health issue in this population. By focusing on this specific context, thereby paving the way for targeted interventions and strategies to address these disparities and improve the health of this population.

The study uncovered a multitude of influential factors that contributed considerably to the risk of depression among urban seniors. These variables included their marital status (such as being single, widowed, divorced, or separated), inadequate diet, inadequate relaxation and sleep, the presence of close relatives with depression, low self-esteem, and limited

social support. These variables demonstrated a remarkable ability to predict the likelihood of depression among urban elderly individuals, obtaining a prediction accuracy of 57.90% when considered collectively. In addition, the significance of social roles, self-awareness of health status, health behaviors, gender, education level, and occupation was revealed by an examination of factors influencing depression risk among the elderly in the upper northern region. These factors had a predictive accuracy of 67.00% in determining the likelihood of depression among the elderly.⁶

First, single status was revealed as a significant risk factor for depression among the elderly, with a 16.19 times higher likelihood when compared to married individuals. Similarly, being widowed, divorced, or separated was related with a 12.98 times higher risk of depression than being married. These findings show that the elderly who find themselves in such a scenario may encounter issues linked to social isolation and a lack of care or support from close relationships. These conditions can contribute to feelings of loneliness, tension, and worry, which, if untreated, can

lead to depression.²³ These findings are consistent with prior research that has highlighted single status as a risk factor for depression in an aging culture, with a 1.8-fold increase.⁸ Furthermore, marital status, divorce, or separation among the elderly have continuously appeared as statistically significant factors related with depression, with the risk being about 14 times higher when compared to persons who are married.²⁴ These findings emphasize the need of understanding and resolving the psychological influence of relationship status on the mental well-being of the aged population.

Second, dietary inadequacy was identified as a significant risk factor for depression among the elderly, with individuals with inadequate diets having a 27.22 times greater likelihood of experiencing depression than those with adequate diets. Likewise, inadequate rest and sleep were associated with an 8.44-time increased risk of depression compared to adequate rest and sleep. The effects of ill behaviors on the mental health of the elderly are highlighted by these findings. The connection between inadequate diets and depression can be explained by the effects of weight loss and insomnia, which frequently result in fatigue, lack of energy, and decreased mobility. In some cases, people may also experience irritability and restlessness, all of which contribute to the development of depressive symptoms.²³ These results are consistent with previous research that has consistently demonstrated a negative association between health behaviors and the risk of depression in the elderly, highlighting the significance of maintaining healthy practices for overall well-being.⁶ Moreover, the significant association between diet, insufficient rest, and sleep with depression in urban elderly individuals supports the notion that these factors play a crucial role in the onset of depressive symptoms.²⁵ This demonstrates the importance of addressing and promoting healthy lifestyle behaviors as

part of preventative measures and interventions aimed at reducing depression among the elderly.

Third, it was discovered that having a close relative with depression substantially increased the risk of depression in individuals, with a risk 29.28 times higher than those without a family history of depression. The influence of familial factors on mental health can account for this association. When one family member has depression, it increases the likelihood that other family members will also develop the disorder, although the prevalence within a family can range from 31% to 42%. However, it is important to observe that not everyone with a depressed relative will necessarily develop depression themselves, indicating the presence of other contributing factors.^{9, 23} These findings are consistent with previous research²⁶ indicating that individuals with affected family members are more likely to develop depression. In addition, previous research has demonstrated the influence of genetic factors on depression in the elderly, further supporting the role of familial and genetic factors in the development of depression.⁹ Understanding the impact of familial ties and genetic predispositions can help healthcare professionals identify individuals who may be at a greater risk for depression and provide targeted interventions and support to mitigate its effects in these individuals.

Fourth, low self-esteem was found to substantially increase the risk of depression in the elderly, with a 62.14-time increased risk compared to those with high self-esteem. This relationship can be explained by the effect of self-perception on psychological health. Depression is more likely to develop in elderly individuals who have negative self-perceptions and a low sense of self-worth. Such negative self-perception may be the result of physical changes, decreased performance, feelings of inadequacy in terms of acceptance, value, and affection

from family and others, and a diminished sense of usefulness to family and society. Thus, these emotions contribute to the development of depression in the elderly. In addition, low self-esteem can manifest as a lack of assertiveness and a diminished sense of dignity, which leads to the belief that one's contributions and value to others are limited. It also promotes feelings of fear and discontent with one's own existence. These findings are consistent with previous research²⁷ that demonstrated the association between self-esteem and depression among urban-dwelling elderly individuals. In addition, negative thinking has been identified as a contributor to depression,¹⁰ and self-esteem has been found to have a statistically significant correlation with depression at the 0.001 level.²⁵ Understanding the effect of self-esteem on the mental health of the elderly can help healthcare professionals implement targeted interventions and support to boost self-esteem and reduce the risk of depression in this population.

Lastly, elderly people with low social support had a significant 13.07 times higher chance of developing depression than those with excellent social support, according to research. The significance of both physical and mental care for elderly well-being can be used to explain this association. When faced with difficulties, having a network of dependable friends in the community or easy access to medical experts can offer beneficial chances for discussion, advice, and help, thereby averting the emergence of depression among the elderly. The elderly must have easy access to local health care providers and recreational facilities, as these amenities can improve their overall mental health. These results are consistent with earlier research that showed the negative impact of a lack of or inadequate social support on the prevalence of depression.⁶ Depression has been statistically

significantly and repeatedly linked to a lack of social support.²⁸ A substantial risk factor for depression has also been discovered as the lack of senior caretakers.¹¹ The presence of social support, which includes knowledge, opportunities, networks, material assistance, and emotional support, is essential for reducing depression among the elderly.⁹ Elderly sadness has also been linked to social inactivity and a lack of social capital, according to a previous research.¹³ With a statistical significance level of 0.001, receiving social assistance has been substantially linked to depression in senior residents of suburban neighborhoods.²⁴ Last but not least, it has been discovered that depression in urban elderly people is connected with social capital support and contentment.²⁷ Elderly depression can be prevented and treated by recognizing the value of social support and implementing strategies in place to make it stronger.

CONCLUSION

Early prevention of depression in the elderly requires a comprehensive comprehension of influential risk factors, such as single status, dietary inadequacy, having a direct relative with depression, low self-esteem, and low social support. To effectively address this issue, collaboration among various stakeholders, including not only relevant agencies but also family members, close friends, communities, and service centers, is essential. By protecting the elderly from depression, we not only promote their well-being and improve their quality of life, but also alleviate the socioeconomic burden associated with caregiving and reduce the incidence of self-harm or suicide among depressed individuals in aging societies.

RECOMMENDATIONS

Future research should investigate additional factors that may contribute to depression, allowing for a deeper understanding of its root causes through in-depth interviews. This knowledge will be indispensable for planning and implementing targeted prevention strategies and reducing the onset of depression among the elderly.

ACKNOWLEDGEMENTS

The authors thank the participating elderly, village health volunteers, public health personnel, and related people in Phitsanulok province for their cooperation in facilitating data collection and the Faculty of Public Health at Naresuan University for supporting this study.

REFERENCES

1. World Health Organization. Depression and other common mental disorders global health estimates. World Health Organization; 2017.
2. Health Systems Research Institute. Handbook of caring for the elderly: Antidepressant formula. Nonthaburi: Openworlds; 2016.
3. Department of Mental Health. Annual report of the Department of Mental Health, fiscal year 2021. Ministry of Public Health; 2021.
4. Department of Older Persons. Depression in older persons [Internet]. 2021 [Cited 2021 Mar 18]. Available from: <https://www.dop.go.th/th/know/15/546>
5. National Statistical Office. Social indicators 2017. Ministry of Digital Economy and Society; 2017.
6. Kantamoon W, Wongsawat P. Factors influencing risk of depression among the elderly in the upper Northern region. EAU Heritage Journal of Science and Technology. 2016; 10(3):83-92.
7. Saelim S. Prevalence and associated factors of depression in the elderly in Muang Ranong District, Ranong Province. Reg 11 Med J. 2019;33(1): 193-202.
8. Faramarzi M, Cheraghi M, Zamani M, Kheirkhah F, Bijani A, Hosseini SR. Gender-specific predictors of depressive symptoms among community elderly. J Res Health Sci. 2017;17(2):e00377.
9. Yoelao D. The development of community model and mechanism for the care and prevention of depression and anxiety disorder in the elderly. Srinakharinwirot University, Foundation of Thai Gerontology Research and Development Institute; 2015.
10. Salasawadi P, Khunarak U, Rithpunmoung P. Factors predicting of depression major depressive patients at Somdet Chaopraya Institute of Psychiatry. J Somdet Chaopraya Inst Psychiatr. 2016;10(2):50-9.
11. Wongmai A. Factors predicting depression and prevention strategies in depression among elderly in Maewang Sub-District Municipality, Maewang District, Chiangmai province. [Master's thesis]. ChiangMai Rajabhat University, Faculty of Public Health; 2017.
12. Yang Z, Chen R, Hu X, Ren XH. Factors that related to the depressive symptoms among elderly in urban and rural areas of China. Zhonghua Liu Xing Bing Xue Za Zhi. 2017; 38(8):1088-1093. doi:10.3760/cma.j.issn.0254-6450.2017.08.018.
13. Kim H, Kwon S, Hong S, Lee S. Health behaviors influencing depressive symptoms in older Koreans living alone: secondary data analysis of the 2014 Korean longitudinal study of aging. BMC Geriatr. 2018;18(1):186. doi: 10.1186/s12877-018-0882-4.

14. Phra Sri Maha Pho Hospital, Department of Mental Health, Ministry of Public Health. Guidelines for the care and surveillance of depression at the provincial level, 4th revision. Ubon Ratchathani: Phra Sri Maha Pho Hospital; 2017.
15. Health Data Center. Standard report, Health Region 2, Phitsanulok Province [Internet]. 2014 [Cited 2021 Mar 18]. Available from: <https://plk.hdc.moph.go.th/hdc/main/index.php>.
16. Department of Mental Health, Ministry of Public Health. Annual report of the Department of Mental Health, fiscal year 2018. Bangkok: Lamom; 2018.
17. Wayne WD. Biostatistics: A Foundation of analysis in the health sciences. 6th ed. New York: John Wiley & Sons; 1995.
18. Office of Elderly Health, Department of Health, Ministry of Public Health. Standard guide for elderly health promotion services in community hospitals and sub-district health promotion hospitals. Office of Academic Services Silpakorn University; 2018.
19. Best JW. Research in education. 3rd ed. Englewood Cliffs, NJ: Prentice Hall; 1977.
20. Ministry of Public Health. Handbook for Screening and assessment of elderly health. Ministry of Public Health; 2021.
21. Rovinelli RJ, Hambleton RK. On the use of content specialists in the assessment of criterion-referenced test item validity. *Tijdschrift voor Onderwijsresearch*. 1977;2(2):49-60.
22. DeVellis RF. Scale development: Theory and applications. 4th ed. Thousand Oaks, CA: Sage; 2017.
23. Department of Mental Health, Ministry of Public Health. Guidelines for the use of mental health tools for public health personnel in community hospitals (Chronic Disease Clinic). Bangkok: The Agricultural Co-operative Federation of Thailand; 2015.
24. Lueboonthavatchai O, PanLarp S. The related factors of depression among the elderly in suburb community, Bangkok. *J Health Health Manag*. 2016;3(3):25-36.
25. Liu Y, Li T, Guo L, Zhang R, Feng X, Liu K. The mediating role of sleep quality on the relationship between perceived stress and depression among the elderly in urban communities: a cross-sectional study. *Public Health*. 2017;149:21-7. doi:10.1016/j.puhe.2017.04.006.
26. Disu TR, Anne NJ, Griffiths MD, Mamun MA. Risk factors of geriatric depression among elderly Bangladeshi people: A pilot interview study. *Asian J Psychiatry*. 2019;44:163-9. doi: 10.1016/j.ajp.2019.07.050.
27. Lee HJ, Lee DK, Song W. Relationships between social capital, social capital satisfaction, self-esteem, and depression among elderly urban residents: Analysis of secondary survey data. *Int J Environ Res Public Health*. 2019;16(8):1445. doi:10.3390/ijerph16081445.
28. Malinee Y, Suthanan K, Sasiwimon B, Kainapa K. A study of factors relating to depressive disorder among people who live in slum in Bangkok. *J Boromarajonani Coll Nurs Bangkok*. 2018;34(3):100-7.