

Factors Affecting Stress Under Covid-19 Pandemic Among Older Adults In Ethnic Group

Pornpavee Khamluang¹, Assoc. Prof. Dr. Supaporn Sudnongbua²

¹Faculty of Public Health, Naresuan University, Phitsanulok 65000, Thailand
Email.amperepavee@gmail.com ORCID ID: 0000-0002-2621-5830

²Faculty of Public Health, Naresuan University, Phitsanulok 65000, Thailand
Email.lillysupaporn@gmail.com ORCID ID: 0000-0003-0313-5042

Abstract

Stress among the elderly remains a major public health problem, especially among ethnic elderly people in Thailand due to rapid social changes as well as the recent Covid-19 pandemic. Rural areas in Thailand experience stress, which has a significant impact on the mental health and livelihoods of residents. This cross-sectional study aimed to examine the factors affecting stress under Covid-19 outbreak among Tai Lue elderly people with a total of 334 samples. Data were analyzed by quantitative statistics and multiple regression analysis. With respect to multiple linear regression, it was found that psychological factor ($\beta = 5.005$, $p < 0.000$), social support factor ($\beta = -2.899$, $p < 0.007$), income factor ($\beta = 3.049$, $p = 0.019$), gender factor ($\beta = -2.561$, $p = 0.049$) significantly predicted factors influencing stress among the Tai Lue elders. The overall multiple regression was statistically significant ($R^2 = 0.148$, Adjusted $R^2 = 0.138$, $F(1, 325) = 3.910$, $p = 0.49$). Regarding recommendation, health care workers need to provide care for the ethnic elderly people, not only physical care but also mental care due to Covid-19 situation. Also, psychological factors as well as social support has become major factors during global economic crisis and the global pandemic. Therefore, the stress of the ethnic elders should be concerned and assessed to plan a stress management model for treating them and preventing those who are at risk from getting stress.

Keywords: Stress, Covid-19 pandemic, Tai Lue, Older adults, Ethnic Group .

Introduction

Among the elderly, stress is a major public health problem, with as many as 33.7% of the world's population affected by anxiety disorders during their lifetime (Konstantopoulou et al., 2020). Constant anxiety or stress can cause anxiety disorders. Physical activity may include tremors, angina, and insomnia, which can develop and lead to physical and mental ailments such as anxiety disorders, depression, endocrine disorders, and high blood pressure (Dong & Zheng, 2020). The Covid-19 pandemic is a

widespread outbreak that can lead to increased stress and mental health problems, especially among the elderly (Debowska et al., 2020). During the recent coronavirus outbreak, stress, anxiety, and depression have increased. Lockdown measures and, social distancing have caused a lot of stress among people (Rehman et al., 2021). Covid-19 has led to a significant increase in the prevalence of anxiety and depression among older adults. A lack of interpersonal communication can cause mental stress, which can lead to long-term physical and mental illness (Zhan et al., 2021). With respect to

having a physical impact, Covid-19 has also had a serious impact on people's mental health, both at the individual level and, in the community, affecting everyone at large, causing feelings of fear, anxiety, depression, mood swings, and insecurity (Salari et al., 2020). Stress and anxiety have a significant impact on individuals, communities, and society at large. Prolonged cumulative stress is associated with many chronic conditions and diseases. Psychological stress is also associated with anxiety disorders such as guilt. In the normal course of eating, irritable bowel syndrome, and substance abuse (Williams et al., 2020), stress activates a physical and mental response in which a person's thoughts, feelings, behaviors, and biological mechanisms continually change depending on the environment (Bustamante et al., 2017). Stress causes changes in the physiology of hormones and neurons, resulting in behavioral anxiety, stress, depression, gastrointestinal disorders, and other physiological responses. Stress acts as a link. With the development of many diseases (Kumar & Chanana, 2017), stress and anxiety have many negative effects on the elderly such as disrupting sleep and having a high risk of bodily ailments (Lähdepuro et al., 2019). Physical, mental, and emotional stress are often affected by stress and its consequences for the body (Cool & Zappetti, 2019). Chronic stress can lead to atrophy of brain mass and weight loss. Changes in these structures cause differences in stress responses, perception, and memory. Stress can also cause cognitive changes. Structures in the brain change with long-term effects on the nervous system (Yaribeygi et al., 2017). Ethnic elders are considered a vulnerable group which is Tai Lue Ethnic people who have lived in Northern Thailand. In the past decade, communities and society of Tai Lue Ethnic people have been affected by widespread economic, social, political, and environmental changes. Further, the effects have been more severe. For example, economic and financial crises, floods, and droughts are disasters that tend to be of greater frequency and severity (Office of the Permanent Secretary, 2020). Whether personal, physiological, psychological, social, and environmental aspects can be used to forecast

stress in older persons is the focus of the study. The aim of this research was to assess the stress-related factors in the Tai Lue ethnic group's older population.

LITERATURE REVIEW

As a result of the COVID-19 outbreak, which has migrated to countries all over the world and raised public alarm, mental health in Thailand has been impacted. Dealing with this issue will lessen worry regarding COVID-19 since overestimating risks, exaggerating one's sense of duty, and intolerance for ambiguity are three of the top causes for concern. Further, there should be ongoing research into the issue (Urairak, 2022). The elderly are among the most vulnerable to stress due to the Covid-19 issue due to their deteriorated physical condition, precarious financial circumstances, and general frailty. As a result, it is crucial to learn how to manage stress in a range of settings. In certain ways, these economic volatility attitudes are associated with increased stress among the elderly (Whitehead & Torossian, 2021). The elderly should become more adaptable and will be better able to handle the coronavirus pandemic as a result (Fuller & Huseth-Zosel, 2021). Psychosocial effects among the elderly are enhanced by social support in an effort to reduce stress under epidemic situations (Minahan et al., 2021). Additionally, it was discovered that elderly people face a higher risk of COVID-19-related morbidity and mortality than younger people. Along with physical disease, the pandemic has afflicted older persons with difficulties that will change their quality of life. Physical and mental health among the elderly can be negatively affected for a long time by a variety of factors, including stopping plans, dissatisfaction and tedium,

being apart from friends and family, availability of supplies, and financial hardship, making it harder to be mentally strong and capable of handling stress (Finlay et al., 2021). In addition, Covid-19 pandemic has been threatened those elders' life. Mental health is an important part of health. Older adults are at higher risk of facing mental health problems than other ages. There are other factors besides physical health. A review of the relevant

literature found that mental health factors including finances, daily living, and health factors have a positive effect on stress among the elderly (Klayklueng et al., 2019). Mental health problems are therefore important public health problems that need to be addressed. The stress of the Tai Lue elders should be assessed in order to be useful in planning a stress management model for Tai Lue elders in the future.

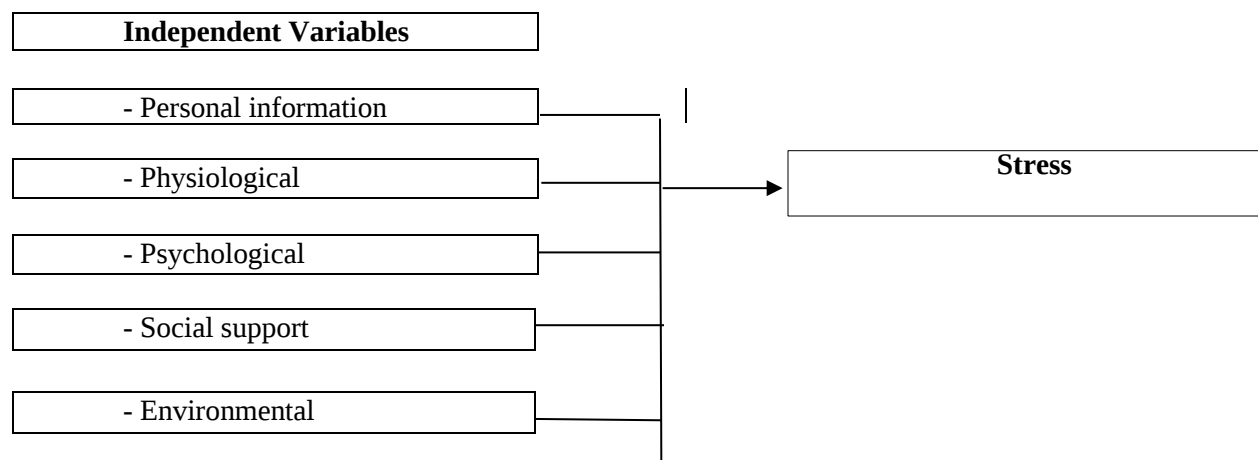


Figure 1: Conceptual Framework of the study shows the relationship between Personal information, Physiology, Psychological, Family, Environment and Stress

RESEARCH METHODOLOGY

Material and Methods

This study employed a cross-sectional study design. The objective of this cross-sectional study was to determine the factors affecting stress under Covid-19 pandemic among the elderly in Tai Lue ethnic people in Thailand. A research plan on the area in the population study was organized, and samples were studied. Sampling tools used for data collection, tool quality inspection, and data analysis are as follows:

Inclusion Criteria:

1. Being male and female elderly aged 60 years and older
2. Having ability to read and write Thai, as well as ability to communicate well in Thai
3. Having consciousness
4. Residing in the research area
5. Being willing to participate in the research project

The exclusion criteria for the samples included 1) those who had been diagnosed by a doctor as having a mental illness, 2) those who wanted to cancel participation in the study during the process, or had a sudden illness, 3) those who felt uncomfortable answering the questions, 4) those who moved out of the research area, 5) those who had psychiatric disorders, and 6) those who had dementia.

Sample size determination

The population is known, the sample size can therefore be calculated from Wayne W., D.'s Estimating Finite Population Mean Formula for Knowing the Sample Size Estimating Finite Population Mean at 95 percent and 5% error level.

A sample size at least 300 individuals is used to assess the percentage with an error which was not more than 5% at a 95% confidence level to prevent omissions or loss of the sample as well as to avoid any impact on the sample. In conclusion, the researchers adjusted the sample size for loss or withdrawal (Drop out) at 10% by using the sample size formula (Chaimay, 2013). Therefore, this study had to add 34 samples for a total of 334 samples. This research used a total of 334 samples.

Research instrument

Data collection tools was a questionnaire. The questionnaire was divided into 6 parts including personal data, marital status, income education (Close-ended questions), and a multiple-choice questionnaire.

Part 1: Personal information of the respondents, i.e. sex, age, occupation, family characteristics, and 17 congenital diseases (Department of Health, 2020).

Part 2: Physiological factors in various issues, namely 1) Movement, 2) Sleep, and 3) Seven health problems, which consisted of scale of 5. The scales (Likert Scale) included the most, the most, the moderate, the least, least, with the respondents choosing only one option.

Part 3: Psychological Factors in various issues, namely 1) Anxiety, 2) Boredom in life, and 3) Loneliness. Five items consisted of questions on a 5-point scale (Likert Scale), i.e. most, most, moderately, least, least, with respondents choosing only one option.

Part 4: Family Factors in various issues, namely 1) Family burden, 2) Family relationship, and 3) Social support (Sudnongbua, 2020). Questions on the Likert Scale comprised 5 levels consisting of most, most, moderately, least, least, with respondents allowed to choose only one answer (Office of the Permanent Secretary, 2021).

Part 5: Environmental factors in various issues comprised 1) Changes in the socio-economic structure, 2) Changes in technology, and 3) The relationships between people. A 5-point scale (Likert Scale) was used, which included most, most, moderately, least, least, with respondents choosing only one option (Thirathanachaikul, 2019).

Part 6: The 20-item SPST-20 stress questions with a 5-point Likert Scale consisting of no stress, slight stress, and moderate stress, as well as very stressful, most stressful. Only one answer could be chosen (Department of Mental Health, 2021).

The tool quality was checked by experts and tested. The data showed Cronbach's Alpha Coefficients with confidence values of 0.85, 0.87, 0.94, 0.90, and 0.91, respectively.

Data collection

To achieve data collection, the researcher conducted data collection according to the following steps:

1. Approval was gained from the Human Research Ethics Committee COA No. 145/2021 to the Nan Provincial Public Health Doctor for permission to conduct research and collect data.
2. The researchers introduced an explanation and clarified the research objectives as well as asked for cooperation in data collection.
3. The researchers visited to prepare teams in the area and build familiarity with the area.
4. Data for the sample group in the target area was gained until the number of samples was complete.
5. A questionnaire was collected and retained to check the completeness of data before analysis.
6. A questionnaire with complete data was used to analyze the data at Naresuan University.

Data analysis

Concerning data analysis, the researcher checked the accuracy and completeness of the questionnaire and analyzed it by statistical methods using the SPSS package program, including descriptive statistics, i.e. frequency

distribution, mean, percentage, and standard deviation.

Analytical Statistic Analysis of factors affecting stress under Covid-19 outbreak among Tai Lue elderly people was Stepwise Multiple Regression Analysis at a level of confidence equal to 95% and statistical significance of 0.05.

RESEARCH RESULTS

Table 1. Percentage, mean and standard deviation of stress scores among the elderly in the Tai Lue ethnic group, Nan Province (n = 334).

It was found that most of the elderly in the Tai Lue ethnic group in Thailand had high-stress levels (47%), followed by moderate stress levels (44.3%), severe stress (6.6%), and low stress (2.1%). Overall, the elderly of the Tai Lue ethnic group in Thailand had high levels of stress.

Stress level	Frequency	Percentage
Minor (0-23)	7	2.1
Intermediate (24-41)	148	44.3
Advanced (42-62)	157	47
Severe (higher than 63)	22	6.6
$\bar{x}$ =43.14, Max = 97, Min = 20, S.D= 12.49		

Relationship between factors and stress

Correlation showed that the relationship between factors and stress comprises fourteen variables as follows: Physical factors, psychological factors,

family factors, environmental change factors, social support factors, health literacy factors, marital status, congenital disease, cost, gender, income, education, access to a health care system, and occupation (Table 2)

Table 2 Relationship between factors and stress (n= 334)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Stress	1														
Physical	.000**	1													
Psychological	.000**	.000**	1												
Family	.113	.069	.089	1											
Environmental change	.310	.001**	.248	.000**	1										
Social support	.000**	.000**	.008**	.000**	.000**	1									
Health literacy	.280	.091	.028*	.000**	.000**	.000**	1								
Marital status	.095	.573	.114	.002**	.145	.821	.003**	1							
Congenital disease	.429	.126	.932	.251	.233	.847	.862	.050*	1						
Cost	.821	.483	.476	.609	.576	.001**	.003**	.889	.768	1					
Gender	.069	.683	.570	.215	.780	.137	.881	.000**	.773	.543	1				
Income	.019*	.563	.878	.583	.786	.650	.547	.063	.285	.015*	.429	1			
Education	.886	.486	.473	.000**	.001**	.552	.000**	.008**	.146	.030*	.105	.088	1		
Access to a health care system	.320	.046*	.410	.154	.153	.008**	.179	.312	.214	.000**	.246	.408	.464	1	
Occupation	.134	.014*	.092	.004**	.034*	.413	.000**	.000**	.004**	.000**	.002**	.824	.000**	.021*	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Multiple regression analysis (MRA) showed that 4 factors affected stress, including Psychological factors (beta= 0.298) Social support factors (beta= -0.140) Income factors (beta= 0.121) and Gender factors (beta= -0.102) Together, all

factors had a 13.8 percent power of prediction for stress ($p < 0.05$) (Table 3).

Table 3 Factors affecting stress

Factors	β	Beta	t	P-value
Psychological factors	5.005	0.298	5.750	< 0.000*
Social support factors	-2.899	-0.140	-2.701	< 0.007*
Income factors	3.049	0.121	2.363	0.019*
Gender factors	-2.561	-0.102	-1.977	0.049*

* P – value < 0.05, Constant = 42.264, R Square = 0.148, Adjusted R Square = 0.138

DISCUSSION AND CONCLUSION

The results of this study showed that psychological factors and income factors had a positive effect on stress, while social support factors and gender factors had a negative effect on stress, with psychological factors having the highest predictive power followed by social support factors, income factors, and gender factors, respectively. The findings are consistent with the results of previous studies (Muijeen, 2015). The study of the factors affecting the mental health levels of the elderly found that the marital factor was associated with mental health level when taken for correlation, while the income factor also affected the mental health of the elderly and was consistent with work. Also, (Klayklueng et al., 2019) found that financial factors, activities of daily living, and health factors had a positive effect on stress among older adults, consistent with the research (Lan et al., 2013, Kobayashi et al., 2015). It was also found that perceived stress levels were higher among women than in men and social capital was associated with stress among the elderly; social support was important for seniors' lifestyles (Seaward, 2017). Further, stress can be linked to the mind, body, and spirit. Making positive choices can help solve problems, which is consistent with research (Babazadeh, 2016) that found stress and anxiety among older adults were factors that affected their quality. Aging, gender variables, education, marital status, comorbidities, as well as housing conditions all contributed to stress, which was also consistent

with the work of (Kantabanlang, 2018). It was found that the elderly were often stressed, with physical and mental health factors, as well as financial status being the factors most affecting stress among the elderly. It was also reported that stress affected both the body and mind and could cause mental disorders. Behavior influences headaches, insomnia, anxiety, overthinking, and depression (Sonkaew, 2018), while stress affects both physical and mental health, as well as loss of ability to manage one's own life, consistent with the work of (Yodthong et al., 2014). Some research found that health and financial factors had a positive effect on stress and depressive symptoms among older adults (Varma et al., 2021). During the recent Covid-19 pandemic, financial factors, despair, loneliness, social isolation, and uncertainty from the Covid-19 pandemic epidemic have had increased the risk for mental health issues, especially among the elderly (Gao et al., 2020). Further, stress and anxiety have become a widespread and serious problem, especially among women (Chesak et al., 2019). Psychological skills training, mindfulness training, physical activity exercises have been employed among the ways to manage stress (Nanjundaswamy, 2020). Being strong in the face of unforeseen events might help you maintain equilibrium in life. Older people who are adaptable often have superior health and quality of life. (Chen, 2020) Social support, psychosocial and psychological help, mental health problem screening, psychoeducation can help prevent stress as well as mental health problems.

The study found that the factors influencing stress under Covid-19 pandemic among the elderly in the Tai Lue ethnic group in rural Thailand were psychological factors ($\beta = 5.005$) with the highest predictive power, followed by social support ($\beta = -2.899$), income ($\beta = 3.049$) and gender ($\beta = -2.561$) respectively. Therefore, this research pointed out the factors influencing stress among the elderly in rural ethnic groups. The findings could serve as a guide to help address stress under Covid-19 pandemic among elderly ethnic people. In addition, it could also be applied to the elderly in other ethnic groups as well as elderly people in general. Further studies should focus on stress among other age groups which may be needed investigation under pandemic situations. Stress is a delicate subject. Findings vary from subject to development because difficulties at various phases of life are unique to each person, their reactions to issues are unique, and their reactions to difficult situations are unique. Tools that are more suited to the issue might be created in the future.

ACKNOWLEDGEMENTS

I would like gratitude is extended for the support provided by the Faculty of Public Health, Naresuan University.

REFERENCES

1. Babazadeh, T., Sarkhoshi, R., Bahadori, F., Moradi, F., & Shariat, F. (2016). Prevalence of depression, anxiety and stress disorders in elderly people residing in Khoy, Iran (2014-2015). *Journal of Research in Clinical Medicine*, 4(2), 122-128.
2. Bustamante, L. H., Cerqueira, R. O., Leclerc, E., & Brietzke, E. (2017). Stress, trauma, and posttraumatic stress disorder in migrants: a comprehensive review. *Brazilian Journal of Psychiatry*, 40, 220-225.
3. Chaimay B. (2013). Sample Size Determination in Descriptive Study in Public Health, *Thaksin.J*, 16(2):9-18.
4. Chen, L. K. (2020). Older adults and COVID-19 pandemic: Resilience matters. *Arch Gerontol Geriatr*, 89, 104124. doi: 10.1016/j.archger.2020.104124
5. Chesak, S. S., Cutshall, S. M., Bowe, C. L., Montanari, K. M., & Bhagra, A. (2019). Stress management interventions for nurses: critical literature review. *Journal of Holistic Nursing*, 37(3), 288-295.
6. Cool, J., & Zappetti, D. (2019). *The physiology of stress Medical Student Well-Being* (pp. 1-15): Springer.
7. Debowska, A., Horeczy, B., Boduszek, D., & Dolinski, D. (2020). A repeated cross-sectional survey assessing university students' stress, depression, anxiety, and suicidality in the early stages of the COVID-19 pandemic in Poland. *Psychological Medicine*, 1-4.
8. Department of Health, Ministry of Public Health. Handbook of operations on the percentage of the elderly population with desirable health behaviors for the year. [Internet]. (2020). [Cited 2020 December 5]. Available from: https://www.chiangmaihealth.go.th/cmpho_web/.document/.
9. Department of Mental Health, Ministry of Public Health. Stress measurement. [Internet]. (2021). [Cited 2021 March 16]. Available from: <https://www.dmh.go.th>.
10. Dong, M., & Zheng, J. (2020). Headline stress disorder caused by Netnews during the outbreak of COVID-19. *Health expectations: an international journal of public participation in health care and health policy*, 23(2), 259.
11. Finlay JM, Kler JS, O'Shea BQ, Eastman MR, Vinson YR and Kobayashi LC. (2021). Coping During the COVID-19 Pandemic: A Qualitative Study of Older Adults Across the United States. *Front. Public Health* 9:643807. doi: 10.3389/fpubh.2021.643807
12. Fuller, H. R., & Huseth-Zosel, A. (2021). Lessons in Resilience: Initial Coping Among Older Adults During the COVID-19 Pandemic. *The Gerontologist*, 61(1), 114-125. doi: 10.1093/geront/gnaa170
13. Gao, W., Ping, S., & Liu, X. (2020). Gender differences in depression, anxiety, and stress

- among college students: a longitudinal study from China. *Journal of Affective Disorders*, 263, 292-300.
14. Kantabanlang Y. (2018). The Relationship between Stress and Sleep Quality among the Elderly. *IJHRI*, 1(2), 15-30.
 15. Klayklueng W, Deoisres W, Wacharasin C. (2019) Factors Associated with Parenting Stress among Grandmothers Raising Their Infant Grandchildren. *JFONUBUU*, 26(1), 11-19.
 16. Kobayashi, T., Suzuki, E., Noguchi, M., Kawachi, I., & Takao, S. (2015). Community-level social capital and psychological distress among the elderly in Japan: A population-based study. *PLoS One*, 10(11), e0142629.
 17. Konstantopoulou, G., Iliou, T., Karaivazoglou, K., Iconomou, G., Assimakopoulos, K., & Alexopoulos, P. (2020). Associations between (sub) clinical stress-and anxiety symptoms in mentally healthy individuals and in major depression: a cross-sectional clinical study. *BMC Psychiatry*, 20(1), 1-8.
 18. Kumar, A., & Chanana, P. (2017). Role of nitric oxide in stress-induced anxiety: from pathophysiology to therapeutic target. *Vitamins and hormones*, 103, 147-167.
 19. Lähdepuro, A., Savolainen, K., Lahti-Pulkkinen, M., Eriksson, J. G., Lahti, J., Tuovinen, S., . . . Räikkönen, K. (2019). The impact of early life stress on anxiety symptoms in late adulthood. *Scientific Reports*, 9(1), 1-13.
 20. Lan, C., Chen, S.-Y., Wong, M.-K., & Lai, J. S. (2013). Tai chi chuan exercise for patients with cardiovascular disease. *Evidence-Based Complementary and Alternative Medicine*, 2013.
 21. Minahan, J., Falzarano, F., Yazdani, N., & Siedlecki, K. L. (2021). The COVID-19 Pandemic and Psychosocial Outcomes Across Age Through the Stress and Coping Framework. *The Gerontologist*, 61(2), 228-239. doi: 10.1093/geront/gnaa205
 22. Muijeen K. (2015). Determinants of Mental Health among Aging. *Tjst*, 23 (2),306-318.
 23. Nanjundaswamy, M. H., Pathak, H., & Chaturvedi, S. K. (2020). Perceived stress and anxiety during COVID-19 among psychiatry trainees. *Asian journal of psychiatry*, 54, 102282.
 24. Office of the Permanent Secretary, Ministry of Social Development and Human Security, Chulalongkorn University Center for Peace and Conflict Studies, United Nations Development Program Office (UNDP). *Human Security Strategic Plan 2013-2023*[Internet]. (2020). [Cited 2020 November 3]. Available from: <http://www.bps.msociety.go.th/uploads/content/download/5350b0d0381f4.pdf>.
 25. Office of the Permanent Secretary, Ministry of Social Development and Human Security, Center for Peace and Conflict Studies, Chulalongkorn University, United Nations Development Programmer. (UNDP). *Human Security Strategic Plan 2013-2017*[Internet]. (2020). [Cited 2021 November 3]. Available from: <http://www.bps.msociety.go.th/uploads/content/download/5350b0d0381f4.pdf>.
 26. Rehman, U., Shah Nawaz, M. G., Khan, N. H., Kharshiing, K. D., Khursheed, M., Gupta, K., . . . Uniyal, R. (2021). Depression, anxiety and stress among Indians in times of Covid-19 lockdown. *Community Mental Health Journal*, 57(1), 42-48.
 27. Salari, N., Hosseini-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulopoor, S., Mohammadi, M., . . . Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Globalization and Health*, 16(1), 1-11.
 28. Seaward BL. (2017). *Managing stress*. Jones & Bartlett Learning.
 29. Sonkaew W. (2018). *Aquatic Therapy Center* [Graduate Thesis]. Bangkok: Sripatum University.
 30. Sudnongbua S. (2020). *Issue Analysis of Teaching Documents Faculty of Public Health*. Phitsanulok, Naresuan University, 3-6.

31. Thirathanachaikul K. (2019). The influence of social support and quality of life on the happiness of the elderly in Bangkok, Pathum Thani, Nonthaburi, and Samut Prakan. Bangkok: Sripatum University
32. Urairak, B. (2022). Effect of the COVID-19 Pandemic Related Mental Health on State Anxiety in Thailand. *Asian Administration and Management Review*, 5(1), 1-6.
33. Varma, P., Junge, M., Meaklim, H., & Jackson, M. L. (2021). Younger people are more vulnerable to stress, anxiety and depression during COVID-19 pandemic: A global cross-sectional survey. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 109, 110236.
34. Whitehead, B. R., & Torossian, E. (2021). Older Adults' Experience of the COVID-19 Pandemic: A Mixed-Methods Analysis of Stresses and Joys. *The Gerontologist*, 61(1), 36-47. doi: 10.1093/geront/gnaa126
35. Williams, J. L., Everett, J. M., D'Cunha, N. M., Sergi, D., Georgousopoulou, E. N., Keegan, R. J., . . . Naumovski, N. (2020). The effects of green tea amino acid L-theanine consumption on the ability to manage stress and anxiety levels: A systematic review. *Plant Foods for Human Nutrition*, 75(1), 12-23.
36. Yaribeygi, H., Panahi, Y., Sahraei, H., Johnston, T. P., & Sahebkar, A. (2017). The impact of stress on body function: A review. *EXCLI journal*, 16, 1057.
37. Yodthong D, Seeherunwong A, Kongsuriyanavin W, Pornchaikate Au-Yeong A. (2014). Correlation between Age, Caregiving Burden Feelings and Depressive Symptoms in Grandparents Rearing Their Grandchildren. *JTNMC*, 29 (1), 108-121.
38. Zhan, H., Zheng, C., Zhang, X., Yang, M., Zhang, L., & Jia, X. (2021). Chinese college students' stress and anxiety levels under COVID-19. *Frontiers in psychiatry*, 915.