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Original Article

Prevalence of depression, and its associated factors among the elderly in Songkhla Province, Thailand: Two-stage cluster sampling study

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ABSTRACT

Background: Depression in elderly usually goes unnoticed in the general population. The aim of this research is to study on the prevalence, and associated factors of elderly depression within Songkhla province. This being a major city with a population of one and a half million, situated in the south of Thailand.

Methods: This is a two-stage cluster sampling study. We collected data from members of the elderly population (65-99 years of age) in Songkhla Province from 1st of September – 30th of November 2015. The sample size was calculated by R-program. We used the 15-item Thai Geriatric Depression Scale (TGDS-15) questionnaire to find the prevalence and its association of factors. The associated factors were analyzed by multiple logistic regression using a backward-stepwise method.

Results: By using TGDS-15, the prevalence of depression in the elderly population in Songkhla province was 12.0 percent. The association of depression as well as potential, associated factors in this study; sex, age, and residential area, were not found to be significant. We found more prevalence among Muslims, those being alone, and having a lower educational level within this area (p-value < 0.05).

Conclusions: The prevalence of depression was quite high among the elderly population of Songkhla province. Many statically, both significant and insignificant, correlations were found. We need an in-depth research, concerning both biological and spiritual aspects to explain the etiology of depression. Then, some policies need to be implemented to intervene those factors, so as to promote better health and quality of life in elderly people.

INTRODUCTION

Depression in the elderly refers to depressive disorders that occur in adults older than the age of 65. These disorders were defined in the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-5)[1] as well as in the International Classification of Diseases (ICD-10).[2] According to DSM-5, the common feature of all of these disorders is the presence of; sad, empty, or irritable moods, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function. Whereas, ICD-10 in depressive episodes, are when the individual usually suffers from depression moods, loss of interest or enjoyment (in overall activities) and reduced energy levels leading to increase fatigability and diminished activity, which becomes a downward spiraling cycle.

In old age, depression often affects people with chronic medical illness and mainly causes personal suffering, family disruption, worsening of the disability, negative outcomes of many medical illnesses, and can therefore increase mortality.[3,4]

According to previous studies the prevalence of elderly depression in the general population, using several questionnaires such as; Geriatric Depression Scale (GDS) and clinical diagnostic criteria in practices such as; DSM-IV TR, ICD-10 criteria, was wide ranging from 0.4% to 35%.[5]

The elderly population in Thailand is continually increasing. This demographic made up 5.9 million (8.9% of the total population) in 2010. According to the United Nations' prospect, the Thai population, over the age of 65, will reach 13 million by 2030 (19.5% of the total estimated population at this time).[6]

In 2002 a field survey study in Thailand, using the Thai Geriatric Depression Scale (TGDS)[7] along with the Thai Mini Mental State Examination, (TMSE) as screening tests found the prevalence of depression to be at 12.78% of which

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8.23% had only depressive symptoms, while 4.55% had both depression and cognitive impairment. The major contributing factors in depression are; finances (income earned or supplied), poor family relationships and physical illness.[8]

Songkhla province is a major city with a population of one and a half million, situated on the south of Thailand and bordering Malaysia. It has been promoted to be the economic center of the southern region of Thailand by its government. Thus, it has recently undergone many changes to be a more 'modernized' society. Songkhla population is made up of about three-quarters Buddhist, and about a quarter of Muslims.[9] Almost all of the population (97.8% - Regardless of religion) can read and write the Thai language.

Since 2005, Songkhla province has encountered many terrorism incidents. These terrorism incidents have been perpetrated by the ethnic and religious separatists who have conducted an insurgency for the historical Malay-Patani Region. This region is made up of the southernmost parts of Thailand; Yala, Pattani, and Narathiwat and also includes four districts of Songkhla. This situation might be a risk factor to depression in elderly.

According to an increasing proportion of elderly people, from 7.9% in 1990 to 11.8% in 2010, Songkhla province is becoming more and more made up of an aging community.[8] In addition, it also has interesting characteristics, which could have an impact on depression within the elderly population such as; having cultural and religious diversity, modernization constant treats from the disruptive, and ongoing, terrorism situation, as mentioned above. The authors intended to study on the elderly population within Songkhla province.

Because, previous studies on this topic tend to cover a wide range, are dated and have ambiguous findings, this study was designed to generate new information regarding the prevalence and correlating factors of elderly depression.

Thus, the aim of this research is to study the prevalence, and its associated factors, which may contribute to depression in the elderly in Songkhla province. After which this data may be used in the prevention and management of these factors which in turn might lead to a better quality of life for such elderly patients in Thailand.

METHODS

This study was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University.

Study Design and Setting

In this two-stage cluster of a cross sectional study, we collected data from members of the elderly population (65-99 years of age) in Songkhla Province during the periods from the 1st of September – through till the 30th of November 2015. Information concerning; age, sex, marital status, address, occupation, religion and educational levels were obtained by means of completing questionnaires.

Sampling Methods

The function n.for.survey from the R program was used for the calculation of the sample size for a survey with cluster sampling (given delta=0.04, design effect=1.5, and alpha=0.05). The prevalence of elderly depression in the Thai elderly population has been reported at 12.8%.[8] Therefore, the required sample size for the general elderly is at least 407 people.

We used two-stage cluster sampling. In the first stage, we used simple random sampling by utilizing ten districts from the current 16 districts. In order to be able to manage data collecting, a list of all Sub-district Health Centers was obtained. Then, the number of samples for each sub-district was calculated. This was depended on the elderly population of each sub-district. We decided to collect data from ten people, per Sub-district Health Center, this was for the convenience of each heath center officer. Therefore, the number of Sub-district Health Centers was calculated to meet the number of samples for each selected district.

Hence, we randomized Sub-district Health Centers to be representatives of that district, in addition to the whole province. After getting the proportionally selected Sub-district Health Care Centers, we contacted the Songkhla Provincial Health Office to ask permissionand to make an appointment, so as to perform the collection of data via these questionnaires at the local level. In addition, we directly contacted the selected Sub-district Health Centers for the data collection.

Inclusion and Exclusion Criteria

Inclusion criteria included those that were elderly, aged between 65-99 years old, living within Songkhla Province, able to understand the questionnaire and had good communication skills. Exclusion criteria were those of the elderly who declined to join the research.

Instruments

We used the 15-item Thai Geriatric Depression Scale (TGDS-15) questionnaire to find the association of these factors. TGDS-15 was developed, and tested for its reliability and validity on 130 elderly people in 2010. The test showed a good, internal consistency (Cronbach's alpha was 0.85).[10,11] The questionnaire consists of 15 yes/no questions. Each question is scored either; 0 or 1 point, the maximum score being 15. We used the cut-off of ≥ 6 for detecting depression, sensitivity of 86% and specificity of 91%.[11]

Depressive symptoms go mostly unnoticed by the general population because they are a common occurrence in their everyday lives. In addition to this, the fact that the elderly may have difficulties remembering information, which may have an effect on the completion of the questionnaire, before collecting the data we had to train our interviewers by both educating them about the questionnaires and training them regarding their data

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collection skills. We allowed them to consult with us about problems in order to ensure that the responses of the volunteers went in the same direction.

Statistical Analysis

Weighted prevalence of elderly depression and standard error (SE) were calculated. The primary sampling unit was district, and the second was Sub-district Health Centers. Sampling weight was calculated by the total number of elderly persons in the selected districts, divided by the number of sampled elderly persons in that district. Sampling probability at the Sub-district Health Center level was not taken into account because, the data to identify the number of the population for each sub-district, in every selected district, was not available. The number of all districts in Songkhla province was used as the finite population correction.

All the data analysis was conducted using the R-Epicalc and R-Survey software. Data were entered by Epidata 3.1, and analyzed using R software version 2.14.2, 2012.[12] The associated factors were analyzed by multiple logistic regression using a backward-stepwise method. The statistical significance refers to p-value < 0.05.

RESULTS

From Table 1, this study was conducted in 64 Sub-district Heath Centers, with a total of 604 elderly people completing the questionnaires. Seventy percent (70%) were female and still married. The level of those with an education higher than primary school was uncommon in the elderly people of this area. Currently almost half of the samples were either retried, or had no occupation. In addition, the elderly people in this study lived in rural areas more so than urban areas.

The prevalence of depression in the elderly population, within the Songkhla Province, from this study was 12.0 percent (SE=0.44). According to Table 2, in regards to; age, occupation and residential areas we found no differences in the prevalence of depression.

According to the logistic regression analysis results in Table 3, we found more prevalence of depression in the elderly whom had no living partner, adjusted odds ratio = 1.47 (95% CI=1.16, 1.87). Depression was also frequently found more among older Muslim people, this was more so than the Buddhist population in this area, adjusted odds ratio = 2.16 (95% CI=1.58, 2.94). Furthermore, higher levels of education were found to be significantly less prevalent in concerns of depression in the elderly, adjusted odds ratio=0.11 – 0.66.

Some districts, as well as the sub-districts in Songkhla province, which is located on the border of Thailand and Malaysia, have had (and are still having) many political conflicts and terrorism incidents. Thus, we had hypothesized that depression in this area might be higher than the areas without conflicts. Otherwise, the results would show no differences between the two areas.

DISCUSSION

The number of depression cases within the elderly population in Songkhla province was so close to a field study

Table 1. Demographic characteristic of the elderly in Songkhla province (N=604)

Demographic characteristics	N (%)
Sex	
Male	176 (29.14)
Female	424 (70.20)
Not available	4 (0.66)
Age group	Mean 72.3 (SD = 5.53)
65-74	408 (67.55)
75-84	180 (29.80)
$\geq$ 85	15 (2.48)
Not available	1 (0.17)
Marital status	
Single	33 (5.46)
Married	407 (67.38)
Divorced/Separated/Widowed	163 (26.99)
Not available	1 (0.17)
Religious	
Buddhist	524 (86.75)
Islam	79 (13.08)
Others	1 (0.17)
Highest level of education	
No education	75 (12.42)
Primary school	405 (67.05)
Junior high school	30 (4.97)
Senior high school	39 (6.46)
Vocational certificate	14 (2.32)
Bachelor degree	34 (5.63)
More than bachelor degree	7 (1.16)
Current occupation	
Employee	21 (3.48)
Merchant	54 (8.94)
Retired	71 (11.75)
Agriculture	226 (37.42)
Personal business	8 (1.32)
No job/finding job/house maid	197 (32.62)
Others	26 (4.30)
Not available	1 (0.17)
Area	
Rural	371(61.42)
Urban	233(38.58)
Border area	
Non-Border area	444(73.51)
Border area	160(26.49)

conducted in Thailand in the past, which used the same questionnaire, TGDS. This prevalence was also in the same range of many studies in the past, both in Thailand and other countries.[5,8,13]

Although, this study presented the same prevalence compared to the last research, showing that more than one tenth of older people in Songkhla province have depression, this prevalence was quite high compared to other mental disorders.[13] Because, healthcare systems have been improving

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over the decade and their health seems better, the life expectancy of the Thai population is becoming longer. As a result of, Thai society quickly becoming more modernized, we also hypothesized that elderly people, born in an era without the quick progression of modern day technology and the fast pace of change, would have more difficulties living in this era. Indeed, depression has still been common among the elderly population, from the past to the present.

Depression, as mentioned above, is a condition leading to many problems in individuals, families and societies.[13] Policies to prevent, detect and treat depression amongst the elderly population are needed.

However, the prevalence from most studies, including this study, was calculated from the cut-point method of standard questionnaires, it might be better if we considered the depressive symptoms as the continuity of normality to depression for its psychometric properties. Then, the prevalence could be more exact, and useful when searching for its associated factors.

The results in this study showed significantly lower rates of depression among the elderly, who were married compared to those who were single, separated, divorced or widowed. Likewise, previous research, persons being married, or those that have a partner would be less likely to suffer from depression.[13,14] Loneliness is a common condition and perhaps explanation, which can be associated with depression in elderly people.[15,16] Elderly persons living without their partner might be more depressed than those because of said loneliness.

Inconsistently, many recent studies showed that higher literacy could be a preventive factor for depression.[17,18,19] Although, a significant correlation between education and depression was also found in this study, the correlation between depression and levels of education was not proportionate to each other. In other words, depression is not decrease consistently, as educational levels increase. Multifactorial association might be the explanation for this finding. In addition, mental health literacy could be a more important factor for the elderly, rather than general literacy. Education in having access to mental health counseling or treatment might furthermore prevent them from the suffering depression.[20] The data of mental health literacy might be more useful as well as significant for us in dealing with depression in the elderly.

Many previous studies found that urban people had more risk of depression than those in a rural environment. According to data from many studies, urbanized life styles, which had a lack of network ties and a concentration of poverty, might lead to depressive and anxiety disorders.[21,22,23] In addition to this, some studies tried to investigate the associations of environment, mental disorders and epigenetic changes, such studies are still has not definitely conclusive.[24]

Contrarily, the result of this study showed no difference of depression prevalence between urban and rural areas. Indeed, these results were consistent to some studies, which found no significant difference of prevalence of mental disorders between urban and rural areas.[25,26,27]

Recently, changes in Thai family structures have compounded this problem. Although many Thai people still live in rural areas, they do have the support of traditional,

Table 2. Weighted prevalence of depression (TGDS>5) categorized by characteristics

Characteristics	TGDS > 5
	% (SE)
Sex	
Male	10.9 (0.7)
Female	12.3 (0.5)
Age	
65-74	11.1 (0.7)
75-84	13.7 (1.1)
≥ 85	18.3 (5.3)
Marital status	
Single	8.9 (3.3)
Married	10.7 (0.6)
Divorced/Separated/Widowed	15.9 (1.3)
Religious	
Buddhist	10.6 (0.5)
Islam	21.9 (1.6)
Others	0
Highest level of education	
No education	17.9 (2.1)
Primary school	11.4 (0.5)
Junior high school	11.7 (2.9)
Senior high school and vocational certificate	15.5 (1.5)
Bachelor degree and more	1.9 (1.1)
Current occupation	
No job/finding job/house maid	15.1 (0.7)
Employee	9.3 (2.3)
Agriculture	12.1 (1.2)
Retired	6.3 (1.5)
Others (including merchant, personal business and not available)	10.2 (1.9)
Area	
Rural	12.4 (0.6)
Urban	11.5 (0.5)
Border area	
Non-Border area	11.5 (0.5)
Border area	13.7 (0.8)

extended families.[28,29] As with many major, provincial cities in Thailand, Songkhla people were still living together in extended families, or at the very least they still kept in contact, and supported each other even via family members, who might live far away. In addition, Thai people are taught from a young age, to make repayment for their parents' kindness according to religious doctrines as well as cultural norms.[30,31] Most Thais' refuse to let their parents move into an institution for older people.[32] And so, many elderly remain being taken care of by their family members, or relatives.[29,30,32]

We hypothesized that terrorism along the Thai border areas might be the stressors for the elderly to be at risk for depression in some of the districts where we conducted this study. We found no significant differences in contrast to previous studies, which showed that residents living in areas affected by terrorism suffered from depression.[33,34]

Table 3. Logistic regression analysis of factors associated with TGDS (final model)

Characteristics	Crude Odds Ratio (95% confidence interval)	Adjusted Odds Ratio (95% confidence interval)
Marital status		
Married	1	1
Single/Divorced/Separated/Widowed	1.49 (1.17, 1.91)	1.47 (1.16, 1.87)
Religious		
Buddhist	1	1
Islam/others	2.21 (1.69, 2.87)	2.16 (1.58, 2.94)
Highest level of education		
No education	1	1
Primary school	0.62 (0.44, 0.88)	0.66 (0.46, 0.94)
Junior high school	0.63 (0.33, 1.23)	0.73 (0.39, 1.37)
Senior high school& Vocational certificate	0.91 (0.63, 1.31)	1.04 (0.74, 1.46)
Bachelor degree and more	0.09 (0.03, 0.31)	0.11 (0.03, 0.38)

There were many factors associated with the depressive symptoms of residents within these terrorism areas such as; financial hardship, material deprivation and lower social support.[35] Due to the diversity of these factors, the prevalence of depression between this study and previous studies was different. The Thai government has launched many policies to control situations, and alleviate distress in people within these areas. Moreover, Thai culture, which has a compromising life style, might ease the conflicts, and tends to make people, in said areas, worry about and help each other. So, the prevalence in the elderly, who live in said terrorism areas, in this study was not as high as we had expected.

Statistically significantly, higher prevalence of depression among Muslim people in Songkhla province compared to other religions was found in this study. Previously, a lot of research found associations of religious beliefs and depression, but some are still controversy.[36,37,38]

That is to say that although, some studies tried to relate many concepts of religious beliefs to depression, or well-being there were still no clear explanations for this association.[38,39,40] The applications of this correlation for treating depression remains unclear as well.[41] Furthermore, this was a cross sectional study, the cause-effect ratios could not be assumed.

We need more well designed studies such as; in-depth interviews in qualitative studies to explain the association of religion and depression. This is especially important in an older population, who often had some religious attendance or strict belief system. After such studies perhaps the related common matters of many religious could be used as protective factors in elderly people at risk.

LIMITATION

This study was a cross sectional study, thus the cause-effect could not be inferred. There were some problems in communication with the elderly people such as; difficulty in understanding the questions and recalling the symptoms, according to the questionnaire. This could have affected the results in this study. Furthermore, this study also had an imbalanced proportion between the two genders, this could also be an additional confounder to the results.

IMPLICATION AND FUTURE RECOMMENDATION

We do need prospective, or meta-analysis studies to find the prevalence and its associated factors of depression in the elderly. Eventually, we could establish policies to intervene these factors, and elderly people would have lower rates of depression, which in course would lead to better health for the rest of their lives.

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CONFLICT OF INTEREST STATEMENT

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