Gender Differences in Depression and Risk Factors among Thai Older Adults

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Abstract— Introduction: Depression is a significant public health issue across all sociodemographic groups including the elderly. The aims of this study were to determine the prevalence of depression and gender differences in risk factors of depression among Thai older adults.

Materials and Methods: A total of 1,604 community-dwelling older aged 60 years and over in the north-eastern region in Thailand were enrolled in this study. This cross-sectional survey was conducted to collect information on demographic characteristics, social support, community participation, and gender roles in a family. Depressive symptoms were assessed using 30-item Geriatric Depression Scale. Odds ratios and 95% confidence intervals were estimated using multiple logistic regression with Forward Stepwise method.

Results: The overall prevalence of depression was 15.2%; 17.6% in females and 12.3% in males. The overall risk factors of depressive symptoms were: perceived fair and poor health (OR = 3.52, 1.88, respectively), low social support (OR =3.30), not participating in community activities (OR = 1.73), single (OR = 1.63), not having domestic responsibility (OR = 1.56), and low household income (OR = 1.42). There were different risk factors in depressive symptoms between male and female older adults. The unique risk factor for females was never married/widowed/divorced (OR = 1.52). The unique risk factor for males was living alone (OR =8.14).

Conclusion: Our findings confirmed that female older adults have a greater prevalence of depression than the male group. The results of this study may offer meaningful policy implications in planning gender specific interventions to improve older people's mental health..

Keywords— Community participation, geriatric depression, living alone, perceive health status social support.

I. INTRODUCTION

An older population is a significant global demographic phenomenon. It has been estimated that approximately 142 million people or about 8% of the population of the South-East Asia region are over 60 years[1]. In 2017, Thai aged population was 16.7% of the total population[2]. Depression is a significant public health issue across all sociodemographic groups including the older ages[3]. Depression in older people is an important public health issue because it increases the risk of comorbidity, disability, mortality, and suicide[4]. Depression affects approximately 7 % of the world's older population[5].

Worldwide, depression in older population ranged from 4.7 - 16 %[6]. In Asian countries, the prevalence of depression in older population ranged from 12 – 34%[7]. In Thailand, the depression rate is 9.3% in the older population[1]. The common risk factors for depression in the older people included sex, physical health status, living status[4], marital status, educational status, income[8], social engagement, family support, chronic disease, sleep disturbance[9], and perceived health status[10].

Depression is twice as common in women including older population[8,10-12]. A number of studies revealed that gender-based differences contribute significantly to the higher prevalence of depression[13]. Gender is a social construction and varies across cultures. However, the different health outcomes between men and women, which are influenced by gender including social roles, social expectations, and social constraints, are rarely examined in heath research[12]. As a result, health policies tend to be gender-blind, assuming that men and women are the same[14]. Gender awareness is important to avoid gender bias in research[15]. There are a few studies that looked at different factors of depression between men and women subjects. Takagi, Kondo, and Kawachi[16] found that higher social participation and performing key roles in the organization were protective factors for depression in women but not in men. Living alone was a risk factor of depression in older adult Korean men but not in women[17].

The sex differences in depression is associated with the gender roles favored by society for men and women. In patriarchal or traditional societies including Thailand, men trend to have more power and privilege than women. Firstly, in marital relationship, men have more power from their autonomy and decision-making power within household than women. Secondly, women have more domestic responsibilities than men. Thirdly, men are commonly in a social position over women[18]. Restriction by gender roles may contribute to depression in women[19]. As Thai society has changed from agriculture society to industrial society, some gender roles in older age may change such as decision-making roles and domestic roles. We are interested in gender roles in older populations that may contribute to depression including

a family leader role, a family decision role, and domestic responsibility. Retirement age in Thailand is 60 years old; therefore, we did not include the breadwinner role in this study.

II. OBJECTIVE

The aim of the present study is to determine the prevalence of depression and the risk factors of depression among the community-dwelling older population in the north-eastern region in Thailand. The north-eastern region is the biggest region in Thailand. This study also examined risk factors of depression in specific sex. We hypothesized that there would be differential impact of risk factors on depression between older women and older men in Northeastern Thailand.

III. MATERIALS AND METHODS

This cross-sectional study was conducted among a population 60 years and over in the north-eastern region in Thailand. The sample size was calculated based on Milton's formula[20] using findings R^2 equal 0.252[10]. Four stage stratified cluster random sampling was used which required 1,764 subjects. However, there were 1,604 subjects (90.93 %) in this report.

Measures

The dependent variable in the present study was depression, screening by the 30-item Geriatric Depression Scale (GDS) Thai version. The original GDS was developed by Yesavage et al.[21]. It is widely accepted that the GDS is a valid and reliable screening tool for older depression in English speaking and other non-English speaking countries[9]. Previous studies have demonstrated an acceptable internal consistency and construct validity of this instrument among older population[22]. The GDS Thai version has also been validated. Total score ranges from 0 to 30. A cut –off point of 12 points or higher is considered to have depression. The internal consistency reliability was 0.93[23].

The independent variables were classified as (a) the socioeconomic variables; age, sex, marital status, household income, status of education, occupation, number of family members, and perception of health (good, fair, poor). Gender roles were answered in a binary response format (yes/no) including family leader, decision maker, and domestic responsibility. Community participation was answered in a binary response format (yes/no). Social support was assessed by Social Support Measurement, originally developed by Luangsirithian[24]. The Social Support Measurement is a Likert rating scale with 35 items. Total score ranges from 35 to 175; the higher score indicates greater receipt of social support. The internal consistency reliability was 0.90. A cut –off point of 119 points or higher is considered to have social support.

Data collection

To conduct home visits, permission was received from the local authorities. After written informed consent taken from the subjects, subjects were interviewed face to face, based on the structure measurement study package by trained research assistants. The study was approved by the ethics committee of the Khon Kaen University.

Data analysis

The data was analyzed using the statistical computer software 'Statistical Package for Social Science (version 17). Socio-demographic and independent factors were shown as a frequency and percentages. The univariable analysis (Chi-square and logistic regression) was used to determine the association between depression and the independent variables, crude odds ratios, 95% CI for OR and p-values, any variable whose univariable test has a p-value less than p <0.05 is selected for multiple logistic regression analysis. Meanwhile, the multiple logistic regression using Forward stepwise method was used to determine the risk factors associated with elderly depression. The level of significance was set at P<0.05.

IV. RESULTS

Sociodemographic characteristics and prevalence of depression

The sociodemographic characteristics of the respondents are shown in Table 1. A total of 1604 respondents were included in the present study. The sample comprised 55.2% female respondents. Majority of the sample was aged between 60-68 years old (56.1%), with a mean age was 68.55 years. Males had significantly more married status than females, higher education than females, and more secure work. Regarding gender roles, males occupied significantly more family leader roles and family decision making role than females. The overall prevalence of depressive symptoms in the older people was found to be 15.2%, of which 17.6% was in female and 12.3% was in male.

Univariate association between depression and study factors

Associations between depression and study factors were shown in Table 2. Variables that were significantly associated with depression were sex, marital status, household income, living status, education level, perception of health, family decision maker role, domestic responsibility, community participation, and social support. When analyzing sex separately, it was found that the associations among depression and independent factors were different between female and male models as shown in Table 3. Variables that were significantly associated with depression in females but not in males including educational level, family decision maker role, and domestic responsibility. Living status was significantly associated with depression in males but not in females.

Risk factors of depression in older adults

The variables that were significantly associated with depression in univariable analysis were put into multiple logistic regression. Six factors significantly associated with higher risk of depression: perceived fair and poor health (OR = 3.52, 1.88, respectively), not participating with community activities (OR = 1.73), low social support (OR =3.30), never married/widowed/divorced (OR = 1.63), not sufficient household income (OR = 1.42), not having domestic responsibility (OR = 1.56). When analyzing sex separately, risk factors for female older included perceived fair and poor health (OR =5.41, 1.78, respectively), not participating with

community activities (OR = 1.75), low social support (OR =3.29), never married/widowed/divorced (OR = 1.52). The risk factors for older males were perceive fair and poor health (OR =2.37, 2.20, respectively), not participating with community activities (OR = 1.87), low social support (OR =3.29), and living alone (OR =8.14) (Table 4).

TABLE 1. Sociodemographic characteristics and social factors of the sample and comparing between male and female subjects

Characteristics and factors	total (n=1,604)		Male (n=725)		Female (n=879)		P-value
	N	%	N	%	N	%	
Age groups (y)	(mean= 68.55, sd=6.55)		(mean=68.59 , sd=6.69)		(mean= 68.74 , sd=6.38)		0.26
60-68	900	56.1	400	55.20	500	56.90	
69 -99	704	43.9	325	44.8	379	43.10	
Marital status							< 0.01*
Married	1118	69.7	600	82.8	518	58.9	
Single	486	30.3	125	17.2	361	41.1	
- Never married	45	2.8	15	2.1	30	3.4	
- divorced	33	2.1	8	1.1	25	2.8	
-widowed	408	25.4	102	14.1	306	34.8	
Household income							0.32
sufficient	1140	71.1	520	71.7	620	70.5	
not sufficient	464	28.9	205	28.3	259	29.5	
Living status							0.21
With other family members	1586	98.9	719	99.2	867	98.6	
Living alone	18	1.1	6	0.8	12	1.4	
Education							< 0.01*
Secondary school and higher	228	14.2	134	18.5	94	10.7	
Primary school	1376	85.8	591	81.5	785	89.3	
Health perception							0.35
good	638	39.8	298	41.10	340	38.7	
fair	909	56.7	405	55.9	504	57.3	
poor	57	3.6	22	3.0	35	4.0	
occupation							0.01*
Secure occupation	54	3.4	33	4.6	21	2.4	
Insecure occupation	1550	96.6	692	95.4	858	97.6	
Family role							
1) leader role							< 0.01*
yes	997	62.2	618	85.2	379	43.1	
no	607	37.8	107	14.8	500	56.9	
2) decision making role							< 0.01*
yes	1189	74.1	634	87.4	555	63.1	
no	415	25.9	91	12.6	324	36.9	
3) domestic responsibility							0.06
yes	1066	66.5	497	68.6	569	64.7	
no	538	33.5	228	31.4	310	35.3	
Community participation							0.14
yes	914	57.0	424	58.5	490	55.7	
no	690	43.0	301	41.5	389	44.3	
Social support							0.06
Low	550	34.30	234	32.30	316	35.90	
High	1054	65.70	491	67.70	563	64.10	

* Statistical significant at level of P-value < 0.05 by Chi-square

TABLE 2. Association between depression and study factors according to Univariate analysis (n=1,608)

Factor	depress (n=244)		No depress (n=1,360)		Univariate analysis	
	no	%	no	%	Crude OR	P-value
sex						< 0.01*
male (n=726)	89	(12.3)	636	(87.7)	1	
female (n=882)	155	(17.6)	724	(82.4)	1.53 (1.15 to 2.02)	
Age (y)						0.68
60-68	134	(14.9)	766	(85.1)	1	
69 -99	110	(15.6)	594	(84.4)	1.06 (0.81 to 1.39)	
Marital status						< 0.01*
Married	135	(12.1)	983	(87.9)	1	
Single	109	(22.4)	377	(77.6)	2.11 (1.59 to 2.78)	
Household income						0.04*
sufficient	160	(14.0)	980	(86.0)	1	
not sufficient	84	(18.1)	380	(81.9)	1.35	

Factor	depress (n=244)		No depress (n=1,360)		Univariate analysis	
	no	%	no	%	Crude OR	P-value
					(1.01 to 1.80)	
Living status						< 0.01*
with other family members	237	(14.9)	1349	(85.1)	1	
living alone	7	(38.9)	11	(61.1)	3.62	
					(1.39 to 9.43)	
education						0.01*
Secondary school and higher	23	(10.1)	205	(89.9)	1	
Primary school	221	(16.1)	1155	(83.9)	1.70	
					(1.08 to 2.68)	
Health perception						0.01*
good	60	(9.4)	578	(90.6)	1	
fair	164	(18.0)	745	(82.0)	5.20	
					(2.84 to 9.54)	
poor	20	(35.1)	37	(64.9)	2.21	
					(1.54 to 2.90)	
occupation						0.68
Secure occupation	9	(16.7)	45	(83.3)	1	
Insecure occupation	235	(15.2)	1315	(84.8)	1.06	
					(0.80 to 1.39)	
Family role						
1) leader role						0.07
yes	139	(13.9)	858	(86.1)	1	
no	105	(17.3)	502	(82.7)	1.29	
					(0.97 to 1.70)	
2) decision making role						< 0.01*
yes	155	(13.0)	1034	(87.0)	1	
no	89	(21.4)	326	(78.46)	1.82	
					(1.36 to 2.43)	
3) domestic responsibility						< 0.01*
yes	137	(12.9)	929	(87.1)	1	
no	107	(19.9)	431	(80.1)	1.68	
					(1.27 to 2.22)	
Community participation						< 0.01*
yes	100	(10.9)	814	(89.1)	1	
no	144	(20.9)	546	(79.1)	2.14	
					(1.63 to 2.83)	
Social support						< 0.01*
Low	104	(9.90)	950	(90.10)	1	
High	140	(25.50)	410	(74.50)	3.11	
					(2.36 to 4.12)	

* P-value < 0.25; significant

TABLE 3. Association between depression and study factors according to univariate analysis: sex separate analysis

factors	female (n=879)		Male (n=725)	
	Crude OR	P-value	Crude OR	P-value
Age (y)		0.45		0.83
60-68	1		1	
69 -99	1.14		0.95 (0.61 to 1.49)	
	(0.83 to 1.61)			
Marital status		< 0.01*		< 0.01*
Married	1		1	
Single	1.90		2.09	
	(1.34 to 2.70)		(1.25 to 3.48)	
Household income		0.10		0.22
sufficient	1		1	
not sufficient	1.35		1.34	
	(0.93 to 1.95)		(0.82 to 2.14)	
Living status		0.16		.01*
with other family members	1		1	
living alone	2.37		7.36	
	(0.70 to 7.97)		(1.46 to 37.04)	
education		0.04*		0.83
Secondary school and higher	1		1	
Primary school	3.43		1.04	
	(1.47 to 8.00)		(0.67 to 1.63)	
Health perception		< 0.01*		< 0.01*
good	1		1	
fair	6.89		2.65	
	(3.26 to 14.56)		(0.83 to 8.50)	
poor	2.07		2.16	
	(1.38 to 3.11)		(1.30 to 3.57)	

factors	female (n=879)		Male (n=725)	
	Crude OR	P-value	Crude OR	P-value
occupation		0.33		0.11
Secure occupation	1		1	
Insecure occupation	2.06 (0.47 to 8.94)		0.49 (0.21 to 1.18)	
Family role				
1) family leader role		0.83		0.12
yes	1		1	
no	0.96 (0.67 to 1.36)		1.55 (0.88 to 2.73)	
2) family decision making role		< 0.01*		0.19
yes	1		1	
no	1.73 (1.22 to 2.45)		1.49 (0.81 to 2.73)	
3) domestic responsibility		< 0.01*		0.46
yes	1		1	
no	2.01 (1.41 to 2.86)		1.19 (0.74 to 1.90)	
Community participation		< 0.01*		< 0.01*
yes	1		1	
no	2.31 (1.62 to 3.30)		1.87 (1.19 to 2.91)	
Social support		< 0.01*		< 0.01*
Low	1		1	
High	3.15 (2.20 to 4.50)		2.98 (1.90 to 4.69)	

* P-value < 0.

TABLE 4. Risk factors of depression according to multiple logistic regressions using forward stepwise (Likelihood ratio) overall sample and sex separate analysis

Factors	Sample		female		male	
	Adjust OR (95% CI)	P-value	Adjust OR (95% CI)	P-value	Adjust OR (95% CI)	P-value
1) health perception		<0.01*		<0.01*		0.01*
good	1		1		1	
fair	3.52 (1.82 to 6.82)		5.41 (2.40 to 12.17)		2.37 (0.71 to 7.91)	
poor	1.88 (1.35 to 2.64)		1.78 (1.16 to 2.76)		2.20 (1.30 to 3.72)	
2) community participation		<0.01*		<0.01*		<0.01*
yes	1		1		1	
no	1.73 (1.27 to 2.35)		1.75 (1.18 to 2.59)		1.87 (1.17 to 3.01)	
3) social support		<0.01*		<0.01*		<0.01*
high	1		1		1	
low	3.30 (2.45 to 4.45)		3.29 (2.25 to 4.82)		3.29 (2.06 to 5.23)	
4) marital status		0.01*		0.03*		
married	1		1			
single	1.63 (1.20 to 2.20)		1.52 (1.04 to 2.23)			
5) Household income		0.02*				
sufficient	1					
not sufficient	1.42 (1.04 to 1.95)					
6) domestic responsiblity role		<0.01*		<0.01*		
yes	1		1			
no	1.56 (1.15 to 2.13)		1.97 (1.34 to 2.91)			
7) living status						0.01*
not living alone					1	
living alone					8.14 (1.40 to 47.25)	
Constant						
Log likelihood						
Nagelkerke R²						

*p-value≤0.05

V. DISCUSSION

The present study found that the prevalence of depression in older adults in northeastern Thailand was 15.2%. This finding is similar to a systematic review study showing depression rates of 4.7 - 16 % in worldwide older population[6] and 12 – 34% in Asian countries[7]. However, comparing the prevalence of depression in Thai older adults, the prevalence of depression in older population in this study was slightly higher than the prevalence of 9.3% that was reported by WHO[1].This may because this study was conducted in the Northeastern region of Thailand which is ranked as the second poorest region of Thailand[18]. According to Office of Database Development and Social Indicators, one-third of older adults had incomes below the poverty line[25]. Low economic status was common risk factors of depression[26].

The finding of this study also consistent with previous studies that older adult women had higher depression rates compared to older adult men[8,10,17,27]. Older adult women in this study were more likely to never married/widowed/divorced, had lower educational level, had more insecure jobs, and less family decision-making role than the men group. In most studies, older women were poorer, had lower education, more likely to never married/widowed/divorced), and had less family power than men. This inequality may contribute to the higher prevalence of depression in older adult women[9,12,19].

Our study supported previous studies on risk factors of depression in older adults. Similar to previous studies, perceived fair or poor health status, low social support, not community participating in a community activities, being never married/widowed/divorced, and not sufficient household income were risk factors of depression in older adults[4,8,10,12]. We also found that not performing domestic responsibility was a risk factor of depression in older adults. There were three risk factors that explain depression in both male and female older adults including perceived fair or poor health status, low social support, and not participating in a community activity. This study found that perceived poor health status was the greatest risk factor of depression among older adults which is similar to the study in China[4]. This may be because with this aged population, health tends to decline. In the meta-analysis, it was found that poor self-rated health status was risk factor for depression in older adults[28]. Low social support was a risk depression which is similar to the study in China[29]. In a systematic review, low social support was found as a risk factor in depression in all adult age[30-31]. Not participating in community activities was a risk factor of depression. This finding was supported by a review literature which found that community participation could prevent depression in older adults[32]. Social participation may provide self-esteem, social approval, and belongingness[8,16].

This study revealed that sex differences correlated with depression among Thai older adults. We found that being never married/widowed/divorced was a risk factor for older adult women, but not for men. This finding was different from the study in Taiwan that found no sex differences in depression after widowhood[11,33]. In Thailand, older adult women had less education and lower personal income than men[34]. Therefore, women who were never married or widowed/divorced may not have money to support their living status compare to those who had husband to share personal income for them. Having a spouse may be benefit on economic and emotional support.

This study also revealed that living alone was a great risk factor for depression in older adult men, but not for older adult women. This finding supported previous study in Korea that found older adult men who lived alone had more depressive symptoms than older adult women who lived alone[17,35]. The different impact on living status may be explained from gender roles. In Thai society, men are expected to be a breadwinner and women were expected to do domestic roles. Men were not expected to do domestic work[36]. Men received benefits from their woman family members' household work. If they lived alone, they may have a difficult time taking care of themselves. This study emphasized of depression among older adult men who live alone.

Our study did not support our hypothesis that there would be different risk factors that related to gender roles including family leader role and family decision role. This may be because the changes in society. Since Thai society has changed from agriculture society to industrial society, the decision-making roles fall more on the children. In the past, the family's income came from agricultural production which the father controlled. But now the children work outside the family, so the elderly father has no control or power. The leader and family decision role are not variables that affect depression in both men and women. Our finding revealed that not having domestic responsibility was a risk factor for older adult women, but not for men. The previous studies showed that women felt stress and a lack of self-worth when they couldn't perform their domestic chores[37-38]. It is expected of them to assume this responsibility. In this study the men did have some domestic responsibility but the expectation to perform isn't there in the Thai society, therefore, this factor has minimal effect on depression in Thai men[36]. Many younger women in the family, for instance, the daughters or daughters-in-law, work outside home which left the domestic chores to the elder women and men.

Some limitations of our study should be noted. First, this is the cross-sectional design, making it impossible to determine causal relationships. Second, this study focused on community-dwelling older adults in Northeastern of Thailand. It may not be generalizable to other areas. Third, details of some risk factors were not assessed. The questionnaire was using only binary response format (yes/no). For instance, in the question about domestic chores responsibility that affects the depression, we don't know what type of domestic chores might affect the mood. The responsibilities could include cooking, cleaning, taking care of children, taking care of sick family members, etc. There was a study that addressed the older adult female care givers felt more stress than the older adult male care givers when they took care of the Dementia or Alzheimer family members[12]. If there were more people with different status within the family, this might affect the mood as well. It was found that living in multigenerational families

were associated with depression[35]. Therefore, interpretation of the findings need to be cautious.

VI. CONCLUSION

This is one of the few community-based studies to examine the risk factors of depression between male and female older adults. Our findings support the notion that there are different risk factors of depression between men and women older adults. The results of this study may offer meaningful policy implications for Thailand and other developing countries in planning gender specific interventions to improve older people's mental health. To prevent the risk of having depression in older women, the government should create jobs so that older women who were never married, widowed/divorced/separated can earn some income. It is important to develop daily living skills for older men who live alone. More research to examine gender differences in social constructs that relate to depression, both protective factors and risk factors, is needed.

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