ORIGINAL ARTICLE

Relationship between mental health literacy, mental self-care behaviors, and depression among diabetic and hypertensive elderly patients in Chiang Kham, Phayao Province, Thailand

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ABSTRACT

Mental health literacy and self-care are essential for improving mental health outcomes, particularly among the elderly with chronic conditions. However, limited research has explored how these factors interact with depression in elderly individuals with both diabetes and hypertension. This cross-sectional study aims to examine mental health literacy and self-care behaviour, their interrelation, and their influence on depression among elderly individuals with diabetes and hypertension in the Chiang Kham District, Phayao Province. The sample comprised 405 elderly individuals diagnosed with diabetes and hypertension, who were interviewed by the research team utilizing questionnaires for data collection. The data were analysed using descriptive statistics and multiple regression analysis. The results revealed that the demographic was predominantly female (65.20%), with an average age of 68.29 years. Approximately 50.40% exhibited deficient mental health literacy, while 66.70% showed a low level of mental self-care behaviour. Additionally, 13.30% exhibited mild depression. Multiple Linear Regression Analysis identified six predictors of depression: education (B=-2.153, p-value<0.001), income (B=-1.743, p-value<0.01), family history of mental illness (B=1.477, p-value<0.01), alcohol consumption (B=1.035, p-value<0.05), mental health literacy (MHL) (B=-0.047, p-value<0.05), and mental self-care behaviour (MSCB) (B=0.093, p-value<0.001). Therefore, health agencies and related organisations should prioritize mental health activities and policies to alleviate depression among elderly individuals with diabetes and hypertension.

Keywords:
mental health literacy, mental self-care behaviour, depression, the elderly

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INTRODUCTION

The prevalence of depression and its associated treatment cost is increasing globally.[1] Numerous countries facing these challenges encounter a public health crisis due to this mental health disorder.[2] Depression is widespread, resulting in over 700,000 suicides globally each year[3], and WHO has revealed that social and psychological factors can predict depression in older diabetics.[4] A report on the prevalence of depression in Thailand indicated an increasing trend[5], with the annual depression cases reaching 358,267 in 2021.[6] The findings aligned with the data from the Department of Mental Health, which identified that Thai people exhibited the highest risk of depression[7], with the Phayao Province ranking among the top ten provinces for depression prevalence[8], and poor quality of life.[9] Data from 2020 to 2022 indicated a rise in depression among the elderly in the Phayao province, with patients suffering from depression also having comorbidities such as Diabetes Mellitus (DM) and Hypertension (HT).[10] Furthermore, Phayao Province has transitioned into an aging society, resulting in a significant number of elderly individuals experiencing depression.[11] Similarly, the Chiang Kham District, Phayao Province, has fully transitioned into an aging society with the highest prevalence of depression among the elderly.[10]

The prevalence of DM and HT in Thailand is increasing[11], with the highest rates observed among the elderly.[12] A similar trend is observed to be associated with depression,[13] which incurs high treatment costs.[14,15] This aligns with prior research indicating that elderly individuals with non-communicable diseases are vulnerable to and can be associated with depression.[16] This issue is significant and necessitates the examination of factors associated with depression in the elderly, thereby enhancing mental health planning for this demographic.[12] Mental health literacy (MHL) encompasses the understanding and beliefs regarding mental disorders, their identification, management and prevention.[17] This tool assesses the knowledge, skills and beliefs regarding mental health in elderly individuals.[18] Prior research demonstrates that MHL enhances individuals' comprehension of mental health issues and promotes both self-care and care for others.[19,20] Self-care, characterized by activities undertaken independently to sustain life, health and well-being, has been shown to positively correlate with mental health care behaviour.[21] Thus, mental health care behaviours (MSCB) are essential for enhancing positive mental health outcomes in the elderly population.[22]

The literature review indicated that numerous studies have examined stress in elderly individuals with diabetes and hypertension.[23,24,25] Most studies have focused on older people with DM or HT. Secondly, these studies have primarily investigated how depression affects MHL [24] or the quality of life[25]. Thirdly, most Thai studies use the 2Q questionnaire to measure depression in the elderly[24] or people with long-term illnesses[25], while studies worldwide often use the EuroQol-5 Dimension (EQ-5D), EuroQol Group [9] and PHQ-9[26]. In contrast to other studies, this research employed the Thai Geriatric Depression Scale (TGDS) to evaluate the thoughts and feelings of elderly individuals with cognitive impairment and limited education. This tool provides a rapid and straightforward assessment of depression in the elderly with DM and HT.

As mentioned above, the research team used MHL, MSCB and depression as a conceptual framework for this study. This study aims to investigate the level of MHL, MSCB and the severity of depression as

well as to investigate the factors influencing depression and its association with DM and HT in Chiang Kham District, Phayao Province, providing essential data for developing strategies to enhance mental health literacy and prevent depression among the elderly.

METHODS

Study design

A cross-sectional study was conducted among elderly individuals with DM and HT in the Chiang Kham District, Phayao Province, which has exhibited the highest prevalence of depression, from 1st January to 31st March, 2024.

Population and sample

The population of this study encompassed 1,793 elderly individuals aged 60 and above from the Chiang Kham District, Phayao Province, who are diagnosed with DM and HT.[27]

We employed the following formula to calculate the sample size[28].

$$n = \frac{N\sigma^2 z^2_{1-\frac{\alpha}{2}}}{d^2(N-1) + \sigma^2 z^2_{1-\frac{\alpha}{2}}}$$

A total of 405 elderly individuals suffering from DM and HT, were included in the sample size, calculated based on the standard score parameters Z for a 95% confidence level = 1.96[29], population standard deviation (σ) = 0.23, and a desired margin of error (d) = 0.021. This was calculated using the n4Studies [30] software that yielded a sample size of 368 elderly individuals. For the robustness of the study, an additional 10% of the calculated sample size was included, resulting in a total sample size of 405 elderly patients.

This study employed a multi-stage sampling process to select the sample group: Step 1: Select sub-districts using simple random sampling from 10 sub-districts. Drawing lots without replacement, 3 sub-districts were selected: Faikwang (17 villages), Wiang (11 villages) and Maelao (12 villages). Step 2: Random sampling from 3 sub-districts consisting of 5 health promotion hospitals (SDHP), using lots without replacement. This produced Wiang (11 villages), Fai Kwang (11 villages), Ban Wan Khong (6 villages), Nam Min (6 villages) and Mae Lao (6 villages) SDHPs. Step 3: The study used proportional stratified sampling. The total samples consisted of 34 villages and 506 samples, each proportionally divided by population size[31]: Wiang SDHP (11 villages, N=158), Faikwang SDHP (11 villages, N=160), Ban Waen Khong SDHP (6 villages, N=78), Nam Min SDHP (6 villages, N=47) and Mae Lao SDHP (6 villages, N=110). Proportionally random sampling yielded 405 samples from SDHP: Wiang SDHP (11 villages, n=118), Faikwang SDHP (11 villages, m=144), Ban Waen Khong SDHP (6 villages, n=55), Nam Min SDHP (6 villages, n=31) and Mae Lao SDHP (6 villages, n=80), and Step 4: Purposive sampling of 405 samples was conducted based on inclusion criteria from the Phayao Province Health Data Centre's DM and HT registry using non-replacement samples.

We considered the following inclusion criteria for the sample: 1) Individuals (both genders) aged over 60, who have lived in the Chiang Kham District for at least six months. 2) Elderly individuals with diabetes and hypertension enrolled in the Phayao Provincial Public Health Office's Hos.xp Version 4.0 and PCU systems for at least six months. 3) Proficiency in the local language. 4) Mentally alert. 5) Study consent and readiness. We considered the following exclusion criteria: 1) Bedridden individuals. 2) Persons with mental health histories. 3) Elderly individuals holding cognitive disability cards from the Phayao Provincial Social Development and Human Security Office. 4) Elderly individuals with severe depression. The study excluded participants with health conditions that impeded interviews or those who wished to withdraw. The following terms and

conditions were declared to the study participants: 1) The research shall be immediately stopped if volunteers are harmed or suffer major adverse effects. 2) The research will be stopped if it violates ethics committee guidelines.

Research instrumentation

After analyzing relevant literature and research studies, we utilized a modified, speciality-designed four-part questionnaire based on the concept of Jorm,[17] Thangkratok et al. [18] and Ministry of Public Health Thailand.[32] The relevant requirements of the respective parts are detailed below:

Part 1: This section required personal information consisting of 13 demographic and social characteristics: age, gender, marital status, education, income, financial status, occupation, duration of illness, family history of mental illness, smoking, alcohol consumption, drug use history and caregiver status.

Part 2: MHL: This section was based on Jorm,[17] and Thangkratok et al.'s [18] MHL framework. The section included 36 questions mapped to six specific domains. The first, second, third, fourth, fifth and sixth domains comprise the recognition of mental disorders (RMS), knowledge and beliefs about causes (KBC), knowledge and beliefs about self-help (KBSH) and professional help (KBPH), attitudes that facilitate recognition and help-seeking (AFRHS), and the knowledge of seeking mental health information (KSMHI) respectively. We included thirty-six multiple-choice questions with only three choices: positive questions "yes" =3, "not sure" =2, "no" =1, and negative questions "yes" =1, "not sure" =2, "no" =0. The total score for six specific domains was 108.

The assessment criteria for the overall MHL score originated from Bloom [33] categorising scores into three levels: low (0-64 points), moderate (65-86 points), and high (87-108 points).

Part 3: This section focused on MSCB and was adapted from Yodsud's[34] questionnaire that included exercise, stress management, social support and religious activity as self-care behaviours for depression prevention. Positive and negative questions were framed using a 4-point Likert scale: Always, Often, Occasionally and Never. The average weekly practice included 20 items. The scoring criteria limited the answers to one. "Always" = 3, "Often" = 2, "Occasionally" = 1 and "Never" = 0 for positive questions and "Always" = 0, "Often" = 1 point, "Occasionally" = 2 and "Never"= 3 for negative questions. Overall, MSCB was set to score up to 60 points. The scoring was interpreted using Bloom's criteria[36] to divide the scores into Low (0-21), Moderate (22-27) and High (28-36).

Part 4: This section modified the 30-item Thai Geriatric Depression Scale (TGDS) from the Ministry of Public Health.[32] This section involved multiple-choice questions with two possible responses: "yes" if the response matches the respondent's feelings about the issue, and "no" if the response contradicts their views on the issue. The evaluation criteria included 20 positive questions: "yes" = 1, while "unsure" = 0 and ten negative questions: "yes" = 0 points, "no" = 1. Assessment levels and interpretations were based on a maximum 30-point score. The scoring interpretation divided the scores into normal (0-12), mild (13-18), moderate (19-24) and severe (25-30).

The quality assessment questionnaire underwent content validity evaluation via the Index of Item Objective Congruence (IOC) for each of the 99 items across four sections, incorporating feedback from three experts, yielding IOC values between 0.70 and 1.00. The reliability coefficients of the questionnaire

in Parts 2 and 3 were found to be 0.71 and 0.72, assessed using the Kuder-Richardson and Cronbach's alpha formulae, respectively. The questionnaire in Part 4 was created by a consortium of 29 specialists and validity testing indicated an overall reliability of 0.93.

Statistical Analysis

Data were analysed using STATA software version 18, with a significance level of 0.05 accepted for hypothesis testing. Basic premises for data analysis included linearity, independence of errors, normality, homoscedasticity and no multicollinearity. Descriptive statistics were utilised to analyse the personal data of the sample group, including MHL, MSCB and depression. This included frequency, percentage, mean, standard deviation and both minimum and maximum values, with mean imputation used for missing data. The univariate analysis employed Pearson's correlation coefficient to examine the relationships among MHL, MSCB and depression. Multivariate analysis was employed for multiple regression to investigate the relationships between various dependent variables (demographic variables, MHL, MSCB) and an independent variable (depression), utilising the stepwise method for the best selection of dependent variables. The overall regression equation was utilised for the F-test and R-squared analysis, while the regression equation assessed the dependent variables through the t-test and standardised regression coefficients.

RESULTS

The study achieved a response rate of 100% with a sample size of 405 participants. The mean age, as presented in Table 1, was 68.29 years. The majority of the samples were female (65.2%) and among them, 63.7% were either widowed, divorced or separated. Additionally, 48.1% had completed primary education, 37.8% reported an income between 2,001 and 6,000 baht, 62.5% experienced insufficient income and 32.1% were unemployed. The duration of illness for 38.8% of the samples ranged from 6 to 10 years, additionally, 18.3% had a family history of mental illness, 6.7% engaged in smoking and 28.0% consumed alcohol. Nearly the entire sample group, at 98.0%, had no history of drug use and 85.7% had caregivers during their illness.

The MHL of samples indicated that the majority possessed a low level (50.4%), while the MSCB was predominantly low (66.70%). The prevalence of normal depression was 84.9%, followed by a minor incidence of mild depression at 13.4%.

Table 1. Personal Information, MHL, MSCB, and depression among samples.

Variables (N=405)	Frequency	%
Age (years)		
60-69	282	69.6
70-79	94	23.2
≥80	29	7.2
Mean ± S.D.		67.11±6.80
Min. – Max.		60-90
Gender		
Male	141	34.8
Female	264	65.2
Marital Status		
Single	24	5.9

Variables (N=405)	Frequency	%
Widowed/Divorced/Separated	258	63.7
Married	123	30.4
Education		
No	99	24.4
Primary School	195	48.1
Secondary School	66	16.3
Diploma/Bachelor Degree	48	11.9
Income		
< 2,000	154	39.3
2,001-6,000	153	37.8
6,001-10,000	30	7.4
>10,001	63	15.6
Mean ± SD = 5,853.70±7,764.46	Min. – Max. = 600-52,000	
Financial Status		
Insufficient	253	62.5
Sufficient	152	37.5
Occupation		
No	130	32.1
General Employee	69	17.0
Farmer	129	31.9
Merchant/Self-Employed	31	7.7
Government/Private Sector	23	5.7
Other	8	2.0
Duration of Disease (years)		
≥ 6 months -5	122	30.1
6-10	157	38.8
11-20	112	27.7
≥ 20	14	3.5
Mean ± SD = 9.13±5.61	Min. – Max. = 0-35	
Family History of mental illness		
No	331	81.7
Yes	74	18.3
Smoking		
No	378	93.3
Yes	27	6.7
Drinking Alcohol		
No	288	71.1
Yes	117	28.9
History of Drug Use		
No	397	98.0
Yes	7	2.0
Caregiver		
No	58	14.3
Yes	347	85.7
Mental health literacy		
Low Level (0-64 scores)	204	50.4

Moderate Level (65-86 scores)	138	34.1
High Level (87-102 scores)	63	15.6
Variables (N=405)	Frequency	%
Mean ± S.D. = 70.16±13.44	Min. – Max. = 50-102	
MSCB		
Low Level (12-20 scores)	270	66.7
Moderate Level (21-27 scores)	82	20.2
High Level (28-36 scores)	53	13.1
Mean ± S.D. = 33.15±10.02	Min. – Max. = 8-58	
Depression		
Normal (0-12 scores)	344	84.9
Mild (13-18 scores)	54	13.4
Moderate (19-24 scores)	7	1.7
Severe (25-30 scores)	0	0
Mean ± S.D. = 7.36±4.74	Min. – Max. = 0-20	

Pearson's correlation coefficient (**Table 2)** revealed that all eight examined variables, including Overall MHL, RMS, KBC, KBSH, AFRHS, KSMHI and MSCB, indicated a statistically significant negative correlation with depression. Ranking the six variables according to the strength of their correlation from highest to lowest revealed that Overall MHL demonstrated a moderate correlation, followed by MSCB, AFRHS, KBSH, and KSMHI, while RMS and KBPH demonstrated a low correlation.

Table 2. The Coefficient Correlation Between MHL, MSCB, and Depression

Variables (n=405)	$\bar{x}$	S.D.	r	p-value	Level
1. Overall MHL	70.16	13.44	-0.497	<0.01**	Moderate
1.1 RMS	11.89	2.87	-0.377	<0.01**	Low
1.2 KBC	11.20	2.64	-0.411	<0.001**	Moderate
1.3 KBSH	12.34	2.96	-0.435	<0.01**	Moderate
1.4 KBPH	11.41	2.39	-0.339	<0.01**	Low
1.5 AFRHS	11.60	2.77	-0.437	<0.01**	Moderate
1.6 KSMHI	11.72	2.87	-0.430	<0.01**	Moderate
2. MSCB	33.15	10.02	-0.493	<0.01**	Moderate

Remark **p-value < 0.01

The stepwise analysis presented in Table 3 identified six variables that significantly predict depression. The factors included education (B=-2.153, 95% CI=-3.201, -1.105), income (B=-1.743, 95% CI=-2.867, -0.619), MHL (B=-0.047, 95% CI=-0.090, -0.004) and MHB (B=0.093, 95% CI=-0.141, -0.045). All variables exhibited a statistically significant negative correlation with depression. A family history of mental illness (B = 1.477, 95% CI = 0.433, 2.520) and alcohol consumption (B = 1.035, 95% CI = 0.173, 1.897) were significant predictors of depression, demonstrating a positive correlation with the condition. All six variables can significantly predict depression collectively at 35.2% (F-test 36.059, p-value < 0.001).

Table 3. The Multiple Regression Analysis of Depression

Variables (N=405)	B	S.E.	Beta	P-value	95% CI
Education (X1)	-2.153	0.533	-0.196	<0.001***	-3.201, -1.105
Income (X2)	-1.743	0.572	-0.158	<0.01**	-2.867, -0.619
Family history of Mental Illness(X3)	1.477	0.531	0.120	<0.01**	0.433, 2.520
Drinking Alcohol (X4)	1.035	0.438	0.099	<0.05*	0.173, 1.897
MHL (X5)	-0.047	0.022	-0.132	<0.05*	-0.090, -0.004
MSCB (X6)	-0.093	0.025	-0.196	<0.001**	-0.141, -0.045
Constant	20.923	1.657		<0.001***	17.66-24.181
F-test 36.059, p-value<0.001				R^2=0.352	

Remark *p-value < 0.05, **p-value < 0.01, ***p-value < 0.001;

DISCUSSION

The study findings on mental health literacy indicated that 50.4% of samples exhibited low levels, while 34.1% demonstrated moderate levels, as cognitive decline diminishes seniors' risk awareness and self-reliance.[35] This aligns with the findings of Posai et al. [36], who reported that the majority of the sample exhibited moderate levels of MHL among stroke patients. The sample group in this study has an MSCB level of 66.70%, which is considered low. In addition, 34.1% of the samples exhibited low health literacy, resulting in limited MSCB for depression prevention and potentially increasing the risk of developing depression. This finding is inconsistent with the study by Kantamoon and Wongsawat[37], which indicated that health behaviours among the elderly are at a high level. The prevalence of mild depression in the study sample was 13.3%, higher than the results of Maneekeang et al.[38], who studied the general population using a 9Q format, and similar to the research by Srijai and Wongsawat[39] who studied elderly in Thailand using a 2Q format. The observed difference could result from variations in the measurement instruments used; this study utilised the TDGS.

Factors associated with depression in elderly individuals with DM and HT include education, income, family history of depression, alcohol consumption, MHL and MSCB. The six variables together predict depression with an accuracy of 35.2% (F-test 36.059, p-value < 0.001).

Education demonstrated a statistically significant relationship with depression (B = -2.153, p < 0.001). This finding indicated that the elderly individuals aged 60-69 predominantly only completed their primary education. This resulted in insufficient knowledge, understanding and ability to process information regarding mental health, consequently elevating the risk of depression in the elderly population. This aligns with the findings of Kantamoon and Wongsawat[37], which revealed that the elderly individuals who had completed secondary school were at a greater risk of depression than those with higher education (p-value<0.05). It is also consistent with the research conducted by Sakunpong and Ritkumrop[40] which indicated that the level of education exhibits a statistically significant correlation with depression (p-value<0.001).

Income showed a statistically significant association with depression (B = -1.743, p < 0.01). The majority of the studied individuals had an income below

2,000 baht, with 39.5% dependent on elderly welfare, which was regarded as inadequate to meet expenses by 62.50% of the participants. The findings inferred that the prevailing economic and social conditions heightened the risk of depression.[41] This corresponds with the study by Sakunpong and Ritkumrop.[40]

The family history of mental illness demonstrated a significant association with depression (B = 1.477, p < 0.01). This finding is consistent with psychosocial theory, which posits that stressful life events, including a family history of mental illness, may contribute to depression[42]. The study revealed that 15.1% of the sample exhibited mild to moderate depression. Additionally, Lotrakul and Sukanit[43] indicated that in 50.0% of patients with bipolar mood disorders, at least one parent was diagnosed with depression.

Alcohol consumption was significantly associated with depression (B = 1.035, p < 0.05). This study indicated that 28.9% of individuals consumed alcohol, suggesting that it may stimulate abnormal hormonal factors and influence depression in the elderly population[4 3] . Alcohol consumption in Chiang Kham District is influenced by cultural practices and traditional beliefs surrounding home-brewed alcohol used in various events. Aroonrattanapong and Charnsil[44] revealed the same conclusion that 52.8% of alcoholics experienced depression.

MHL demonstrated an association with depression (B = -0.047, p < 0.05). This finding corresponded with Jorm's concept of mental health literacy, which entails individuals' understanding and beliefs about mental health issues, thereby enhancing their capacity to identify, prevent and manage these problems effectively[17]. This study indicated that 50.4% of the sample exhibited low MHL. This may be attributed to the fact that all samples were elderly individuals, with one-fifth lacking formal education and approximately half only completing primary school. This finding is consistent with the study by Zhong et al. [45], which demonstrated that health literacy effectively predicted depression symptoms (B = -0.121, p < 0.01).

MSCB showed a statistically significant association with depression (B = -0.093, p < 0.001). The physical and social changes of the elderly may contribute to diminished mental MSCB. Health or organ deterioration restricts participation in community and physical activities, negatively impacting the mental, emotional, cognitive and self-care behaviours of elderly individuals. Furthermore, advancing age presents a challenge in acquiring knowledge regarding mental health and effectively adapting to diverse environments. This age group exhibits a higher likelihood of experiencing depression compared to other groups. Unipun[21] and Suntaphun[22] demonstrated that self-care behaviours contribute to improved mental health, aligning with Kim and Son's[41] investigation of the relationship between decreased activity levels among hypertensive patients and depression in the elderly population. This study's findings are consistent with those of Kantamoon and Wongsawat[37], who explored depression in older adults and found that healthy behaviours may influence depression (p < 0.05).

CONCLUSION

This study indicates that MHL, MSCB, and personal factors such as income, education, family history and alcohol consumption influence depression in elderly individuals with diabetes and hypertension. MHL and MSCB exhibited greater accuracy than the other social variables.

LIMITATIONS

The limited sample group comprises exclusively elderly individuals with diabetes and hypertension in the Chiang Kham District, Phayao Province. Consequently, the findings of this study cannot be generalised to other populations nationwide.

RECOMMENDATIONS

Public health officials and other relevant stakeholders should concentrate on enhancing MHL and MSCB programmes, prioritising individuals with low income, limited education, a family history of depression and alcohol use. MHL and MSCB should be established and improved among patients with diabetes and hypertension to improve their quality of life.

AUTHOR CONTRIBUTIONS

NS and TS conceptualized the study, conducted data analysis, acted as the principal authors, and revised the article. NS and TS contributed to data analysis and mainly authored the text. NS, TS, and TT formed and monitored the study, facilitated its local implementation, aided in data processing and interpretation, and revised the text. All authors reviewed and approved the final manuscript.

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ETHICAL CONSIDERATION

The Human Research Ethics Committee of the Phayao Provincial Public Health Office sanctioned the research ethics and the protection of participants' rights, as denoted by research ethics number 002/2567, dated October 16, 2023.

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CONFLICT OF INTEREST

The authors declare no conflict of interest in this study.

REFFERENCE

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