ความชุกและปัจจัยที่สัมพันธ์กับภาวะซึมเศร้าของชาวกะเหรี่ยงในจังหวัดตากเขตชายแดนไทย-เมียนมาร์

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บทคัดย่อ

วัตถุประสงค์ ในปัจจุบันการศึกษาเกี่ยวกับภาวะซึมเศร้าในกลุ่มชาติพันธุ์ชาวกะเหรี่ยงยังมีข้อมูลจำกัด ทั้งในแง่ของระบาดวิทยาและข้อมูลอื่นที่จะใช้สนับสนุนในการดูแลรักษาผู้ป่วย การศึกษานี้มีเป้าหมายเพื่อศึกษาความชุกของภาวะซึมเศร้าและปัจจัยที่มีความสัมพันธ์กับภาวะซึมเศร้า ในกลุ่มประชากรชาวกะเหรี่ยงที่อาศัยอยู่ในพื้นที่จังหวัดตากฝั่งตะวันตกของประเทศไทย

วิธีการศึกษา งานวิจัยนี้ทำการศึกษาในกลุ่มประชากรชาวกะเหรี่ยงที่มีอายุ 18 ปีขึ้นไป ซึ่งอาศัยอยู่ในพื้นที่ 5 อำเภอของจังหวัดตากฝั่งตะวันตกตามแนวชายแดนพม่า การศึกษาเชิงพรรณนาภาคตัดขวางนี้เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามประเมินตนเอง 2 ชุด ได้แก่ 1) แบบสอบถามเกี่ยวกับข้อมูลทั่วไปของผู้เข้าร่วมการวิจัย ซึ่งรวมถึงผลกระทบจากสงครามและการระบาดของเชื้อไวรัสโควิด-19 และ 2) แบบประเมิน PHQ-9 ฉบับภาษาไทย สำหรับประเมินภาวะซึมเศร้า วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา การทดสอบไคสแควร์ และการวิเคราะห์ถดถอยโลจิสติก เพื่อศึกษาปัจจัยที่สัมพันธ์กับภาวะซึมเศร้า

ผลการศึกษา มีผู้เข้าร่วมการวิจัยทั้งหมด 578 คน อายุเฉลี่ย 38 ปี (SD = 12.03) โดยร้อยละ 66.8 เป็นเพศหญิง ร้อยละ 13.5 รายงานว่ามีโรคทางกายเรื้อรัง ขณะที่ร้อยละ 2.9 รายงานว่ามีโรคประจำตัวทางจิตเวช พบความชุกของภาวะซึมเศร้า ร้อยละ 23.3 และจากการวิเคราะห์ถดถอยโลจิสติกพบปัจจัยที่สัมพันธ์กับภาวะซึมเศร้าในชาวกะเหรี่ยง ได้แก่ เขตอำเภอที่อยู่ ($p < 0.001$) เพศ ($p = 0.034$) อาชีพ ($p < 0.001$) การมีโรคประจำตัวทางจิตเวช ($p < 0.001$) ผลกระทบจากสงคราม ($p = 0.005$) และกลวิธีในการจัดการความเครียด ($p = 0.02$)

สรุป การศึกษานี้พบว่าอัตราการเกิดภาวะซึมเศร้าในประชากรชาวกะเหรี่ยงในพื้นที่ตะวันตกของจังหวัดตาก มีอัตราสูงกว่าประชากรชาวกะเหรี่ยงในภาคเหนือของไทยเป็นสองเท่า โดยปัจจัยที่สัมพันธ์ ได้แก่ เขตอำเภอที่อยู่ เพศ อาชีพ การมีโรคประจำตัวทางจิตเวช ผลกระทบจากสงคราม และกลวิธีในการจัดการความเครียด ข้อมูลเหล่านี้จะเป็นประโยชน์ในการพัฒนาแนวทางการดูแลรักษาป้องกันแบบมุ่งเป้าในอนาคต เช่น การคัดกรองภาวะซึมเศร้าอย่างสม่ำเสมอสำหรับกลุ่มที่มีความเสี่ยงสูง และการให้ความรู้เกี่ยวกับกลไกการจัดการความเครียดที่เหมาะสม

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Prevalence of Depression and Related Factors of The Karen People in Tak Province, Thai-Myanmar Border Region

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ABSTRACT

Objective: There is limited information on the epidemiology and available support systems among the Karen tribal people. This study investigated the prevalence of depression and its associated factors among the Karen population residing in the western region of Tak Province, Thailand.

Methods: The study was conducted among Karen individuals aged over 18 years, living in the five districts of Tak Province on the western side along the Myanmar border. This cross-sectional study collected data using self-rating questionnaires: 1) general information, which included the effects of war and the COVID-19 pandemic, and 2) the Thai version of the PHQ-9 to assess depression. Responses were analyzed using descriptive statistics, chi-square tests, and logistic regression to identify significant factors associated with depression.

Results: A total of 578 participants had an average age of 38 years (SD = 12.03), and 66.8% of them were female. Approximately 13.5% of participants reported chronic physical illnesses, while 2.9% reported chronic mental health conditions. The prevalence of depression was 23.3%. Logistic regression analysis revealed that the depression-associated factors included district ($p < 0.001$), sex ($p = 0.034$), occupation ($p < 0.001$), mental health conditions ($p < 0.001$), the impact of war ($p = 0.005$), and stress management ($p = 0.02$).

Conclusion: This study found the depression prevalence in the Karen population in western region of Tak Province to be twice as high as in northern Thailand. Six factors district, sex, occupation, pre-existing mental disorders, war experience, and coping style were associated with depressive symptoms. These factors provide valuable insights for developing future targeted interventions, such as routine screening for high-risk groups and promoting adaptive coping strategies through psychoeducation to prevent and treat depression in the Karen population.

Keywords: depression, Karen people, ethnic minorities

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INTRODUCTION

Depression is a significant global mental health issue, affecting the physical and mental well-being as well as the overall quality of life for individuals.[1] Depression is prevalent across populations of all ethnicities and regions worldwide, with numerous studies exploring its prevalence and associated factors in various large population groups. However, research on depression in minority ethnic groups remains limited, particularly among indigenous populations.[2] A study on Aboriginal Australians found a higher lifetime prevalence of depression compared to the general population.[3] Similarly, research in India reported a greater prevalence of major depression among older adults in the scheduled tribe population.[4] In Thailand, studies on depression prevalence among hill tribe populations in the northern region have shown varying results: 39.1%[5], 12%[6], and 11.49%.[7] Identified risk factors included being female, substance abuse, living with a relative, and experiencing stress.[5,6] Given the limited number of studies, further research is essential to better understand depression in these populations and to develop targeted mental health interventions.

For an overview of the research area, Tak Province is located in the western part of Thailand, divided into the eastern and western regions by the Thanon Thongchai Mountain Range. The western side shares borders with Myanmar the western part have a more diverse population, including Thai, Burmese, and various hill tribes, such as the Karen, Hmong, Lahu, Akha, Lisu, and Yao. The western region of Tak Province comprises five districts: Maesot, Phopphra, Umphang, Maeramat, and Thasongyang. Maesot plays a pivotal role in the region's economic landscape. The Maeramat and Phopphra districts are predominantly agricultural, whereas the Thasongyang and Umphang districts are more remote, characterized by mountainous terrain. In some villages, access to roads and electricity is still limited. As a border region, Western Tak faces numerous complex challenges, including illegal border crossings, statelessness, illegal gambling, mass online fraud, drug trafficking, and the effects of urbanization. The long-standing conflict between the Karen ethnic group and the Myanmar government escalated again following the 2021 military coup in Myanmar, leading to increased violence and displacement along the border. Furthermore, during the study period, the COVID-19 pandemic severely impacted the region, particularly in 2021 - 2022, with major outbreaks in Mae Sot and surrounding areas. The crisis exacerbated economic hardship, disrupted border trade, and worsened mental health issues.

The Karen community has been deeply affected by these challenges, leading to an increase in mental health issues, particularly depression. However, cultural and linguistic barriers between the Karen and Thai populations limit a comprehensive understanding of depression within the Karen community. Previous research on Karen individuals who migrated to the United States found that they perceive depression as involving emotional distress, cognitive impairment, and relationship difficulties.[8] Nevertheless, there remains a lack of research on the perspectives and understanding of depression among the Karen people.

This researcher has been working in the western area of Tak Province for several years and has observed a significant prevalence of depression among the Karen people. However, there has been very little investigation into depressive symptoms among the Karen population. In recent years, studies conducted in Chiang Rai Province on both the Karen and other hill tribes have reported a high prevalence of depressive symptoms.[4-7] However, no specific study has examined depressive symptoms among the Karen population in Tak Province. Therefore, this study aimed to 1) determine the prevalence of depressive symptoms among the Karen population in Tak Province, 2) identify factors associated with these symptoms, and 3) compare the findings with data from other population groups. By addressing these research questions, this study sought to enhance our understanding of depressive symptoms among the Karen and contributing to more effective mental health interventions tailored to this population.

METHODS

The study proposal was approved by the Ethics Committee for Biomedical Research of Maesot General Hospital (No. MSHP 20/2565) on April 20, 2022. This cross-sectional study was conducted across five districts in western Tak Province along the Thailand-Myanmar border: Maesot, Maeramat, Phopphra, Thasongyang, and Umphang. Data collection took place from June to November 2022.

The sample sized was calculated based on the standard formula for a cross-sectional design; $n = [Z^2_{1-\alpha/2} *P*(1-P)]/d^2$, where Z is the value from the standard normal distribution corresponding to the desired confidence level (Z = 1.96 for 95% CI), P is the expected true proportion, and d is the desired precision. According to the study conducted by Chomchoei et al., the prevalence of depression was reported to be 12%.[6] Based on Z = 1.96, P = 0.12, 1−P = 0.88, and d = 0.03, at least 451 participants were needed for the analysis. The inclusion criteria included people who identified themselves as Karen, were older than 18 years, and lived in the five districts mentioned above. The participants were selected using stratified random sampling based on districts. Multicollinearity among independent variables was assessed using Variance Inflation Factor (VIF), and no significant multicollinearity was detected.

A total of 578 participants were included. After providing informed consent, participants completed the Thai questionnaire independently. For those who were not fluent in Thai, a translator conducted interviews in Karen. The questionnaire was not translated into Karen, as many in the Karen community rely on oral communication because of limited literacy in the Karen script. To promote consistency, all interviews were conducted by native Karen speakers fluent in both Karen and Thai. The same group of translators was used throughout the study to minimize variability in interpretation. The interviews were conducted with verbal permission after the participants received adequate information about the study.

The questionnaire consisted of two parts: a self-designed demographic questionnaire and the Thai version of the Patient Health Questionnaire (PHQ-9).

A self-designed demographic questionnaire was developed for the participants based on a literature review. In this part, seventeen questions were used to collect the general information of the respondents: age, gender, marital status, occupation, etc. While collecting basic demographic information, two significant events occurred during the research period: the COVID-19 pandemic and the conflict between the Karen people and the Burmese government. Consequently, questions were included to assess the impact of these events and their relationship with depression. The second part of the questionnaire assessed depressive symptoms using the Thai version of the PHQ-9, a widely used screening tool. The Thai version of the questionnaire was tested for both reliability and validity, yielding a Cronbach's alpha value of 0.79.[9] The suitability of the PHQ-9 for screening in primary care has been demonstrated. The PHQ-9 consists of nine questions based on the DSM-IV diagnostic criteria for depressive disorders. Each question is scored on a scale of 0 (not at all) to 3 (nearly every day). The total score ranges from 0 to 27. According to Kroenke et al., depressive symptom severity is categorized as follows: 5 - 9 points indicate mild depression, 10 - 14 points indicate moderate depression, 15 - 19 points indicate moderately severe depression, and scores exceeding 20 indicate severe depression.[10]

In this study, participants were divided into two groups: one group exhibiting symptoms of depression (PHQ-9 ≥ 5) and the other group without depression (PHQ-9 < 5). The adoption of a cutoff of five points mirrors the methodology employed in prior research conducted on the Karen population in Chiang Rai Province.[6]

Statistics analysis

Data were analyzed using descriptive statistics. Categorical variables, including age group, district, gender, marital status, etc., were summarized using frequency and percentage. Only one continuous variable, age, was described using mean and standard deviation. Then each categorical variable was classified into

depression (PHQ-9 ≥ 5) and non-depression (PHQ-9 < 5) groups. Chi-square was used to compare depression group and non-depression group in each categorical variable. Logistic regression analyses were employed to identify the factors associated with depression at a significance level of α = 0.05, included the 95% confidence interval (95% CI) to enhance accuracy. The data were analyzed using the Statistical Package for the Social Sciences 21 (SPSS 21).

RESULTS

Demographic data

A total of 578 respondents participated in the survey. The average age of the respondents was 38 years (SD = 12.03). This study found that 386 (66.8%) of the respondents were female, 432 (74.4%) were married, and 551 (95.3%) lived with their family. Approximately 78 (13.5%) of participants reported having chronic physical illnesses, while 17 (2.9%) had a history of mental health disorders. Additionally, 279 (48.3%) of the respondents had previously COVID-19 infected, and 169 (29.2%) had experienced the impact of war. Notably, Phobphra Maesot, and Thasongyang had the highest proportion of war-affected participants (Fig 1). Further details of the general characteristics of the respondents are presented in Table 1.

Prevalence of depression

Applying a cutoff score of 5 points on the PHQ-9, the prevalence of depression was 23.3%. This is further detailed based on the severity levels listed in Table 2. The mean PHQ-9 was 3.08 (SD = 3.018, minimum 0, maximum 17).

From the Chi square analysis, ten factors were identified as associated with depression (Table 3). Subsequently, through logistic regression analysis incorporating all ten factors, it was revealed that six factors remained significantly associated with depression. These factors include district, sex, occupation, mental disorders, the impact of war, and coping style for stress, as illustrated in Table 4.

DISCUSSION

Prevalence of depression

From the research findings, the prevalence of depression among the Karen people residing in the border districts of western Tak Province was 23.3%. According to a 2017 World Health Organization (WHO) report, the proportion of the global population with depression in 2015 was estimated to be 4.4%.[11] Compared to two previous studies on the prevalence of depression among the Karen population in other areas of Thailand, this study found a

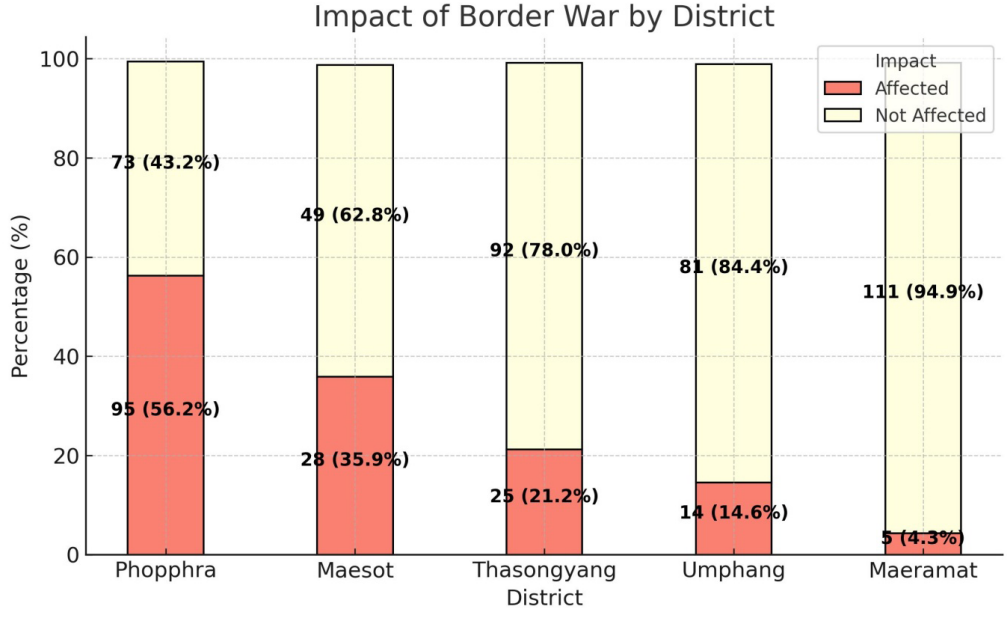

Fig 1. Distribution of border war-affected individuals by district

Table 1 General characteristics of the respondents.

Factors	N = 578 (%)
Age group (mean 38, SD 12.03)	
18 - 30	191 (33)
31 - 40	161 (27.9)
41 - 50	131 (22.7)
> 50	95 (16.4)
District	
Maesot	78 (13.5)
Maeramat	117 (20.2)
Phopphra	169 (29.2)
Thasongyang	118 (20.4)
Umphang	96 (16.6)
Gender	
Male	192 (33.2)
Female	386 (66.8)
Marital status	
Single	101 (17.5)
Married	432 (74.7)
Divorced/widowed	45 (7.8)
Living with…	
Family	551 (95.3)
Alone	20 (3.5)
Other(s)	7 (1.2)
Occupation	
Agriculture	250 (43.3)
Personal business	270 (46.7)
Government officer	24 (4.2)
Unemployed	34 (5.9)
Annual income	
Less than one hundred thousand baht	438 (75.8)
One hundred thousand baht and above	140 (24.2)
Debt	
None	324 (56.1)
Any	254 (43.9)
Education	
Illiterate	230 (39.8)
Below or equivalent to compulsory education*	200 (34.6)
Higher than compulsory education*	148 (25.6)
Medical conditions	
None	500 (86.5)
Any	78 (13.5)
Mental conditions	
None	561 (97.1)
Any	17 (2.9)
Substance use	
Never	409 (70.8)
Ever	169 (29.2)
Perspective on family relationships	
Not good	8 (1.4)
Good	570 (98.6)
Perspective on relationships with people other than family members (e.g., friends, colleagues, neighbors)	
Not good	5 (0.9)
Good	573 (99.1)
Contracted COVID-19	
Never	299 (51.7)
Ever	279 (48.3)
Affected by the border war	
No	409 (70.8)
Yes	169 (29.2)
Coping style when having stress	
Ventilates to others	413 (71.5)
Figure out by oneself	165 (28.5)

* The education system provides nine years of compulsory education, divided into six years of primary school, followed by three years of lower secondary education.

Table 2 The distribution of respondents based on the severity of depression.

Severity of depression (PHQ-9 score) (Mean 3.08, SD 3.018, Min 0, Max 17)	N = 578 (%)
minimal (0 - 4)	443 (76.6)
mild 5 - 9	110 (19)
moderate 10 - 14	21 (3.6)
moderately severe 15 - 19	4 (0.7)
severe > 19	0 (0)

Table 3 Factors associated with depression: Chi-square analysis

Factors	Depression		OR	95%CI		p-value
	No (n = 443 (76.6%))	Yes (n = 135 (23.3%))		lower	upper	
Age group (mean 38, SD 12.03)						
18 - 30	143 (32.3%)	48 (35.6%)	.993	.563	1.750	.981
31 - 40	129 (29.1%)	32 (23.7%)	.734	.401	1.342	.315
41 - 50	100 (22.6%)	31 (23%)	.917	.497	1.694	.782
> 50	71 (16%)	24 (17.8%)	ref			
District						
Maesot	51 (11.5%)	27 (20%)	6.731	2.737	16.552	< 0.001**
Maeramat	100 (22.6%)	17 (12.6%)	2.161	.857	5.453	0.103
Phopphra	122 (27.5%)	47 (34.8%)	4.898	2.115	11.343	< 0.001**
Thasongyang	81 (18.3%)	37 (27.4%)	5.808	2.453	13.753	< 0.001**
Umphang	89 (20.1%)	7 (5.2%)	ref			
Gender						
Female	285 (64.3%)	101 (74.8%)	1.647	1.066	2.543	0.024*
Male	158 (35.7%)	34 (25.2%)	ref			
Marital status						
Married	75 (16.9%)	26 (19.3%)	2.087	1.264	.765	.361
Divorced/widowed	29 (6.5%)	16 (11.9%)	3.860	2.011	1.048	.036*
Single	339 (76.5%)	93 (68.9%)	ref			
Living with…						
Alone	11 (2.5%)	9 (6.7%)	2.817	1.142	6.953	.025*
Other(s)	5 (1.1%)	2 (1.5%)	1.377	.264	7.186	.704
Family	427 (96.4%)	124 (91.9%)	ref			
Occupation						
Personal business	180 (40.6%)	90 (66.7%)	2.878	1.870	4.430	< 0.001**
Government officer	23 (5.2%)	1 (0.7%)	.250	.033	1.910	.182
Unemployed	27 (6.1%)	7 (5.2%)	1.492	.606	3.677	.384
Agriculture	213 (48.1%)	37 (27.4%)	ref			
Annual income						
One hundred thousand baht and above	121 (27.3%)	19 (14.1%)	.436	.257	.739	0.002**
Less than one hundred thousand baht	322 (72.7%)	116 (85.9%)	ref			
Debt						
Yes	204 (46%)	50 (37%)	.689	.464	1.024	0.065
No	239 (54%)	85 (63%)	ref			
Education						
Illiterate	169 (38.1%)	61 (45.2%)	1.42	0.864	2.332	0.166
Below or equivalent to compulsory education	156 (35.2%)	44 (32.6%)	1.109	.658	1.870	0.697
Higher than compulsory education	118 (26.6%)	30 (22.2%)	ref			

Table 3 Factors associated with depression: Chi-square analysis (Con)

Factors	Depression		OR	95%CI		p-value
	No (n = 443 (76.6%))	Yes (n = 135 (23.3%))		lower	upper	
Medical conditions						
Yes	61 (13.8%)	17 (12.6%)	.902	.507	1.605	0.726
None	382 (86.2%)	118 (87.4%)	ref			
Mental disorders						
Yes	6 (1.4%)	11 (8.1%)	6.461	2.343	17.820	< 0.001**
No	437 (98.6%)	124 (91.9%)	ref			
Substance use						
Use	130 (29.3%)	39 (28.9%)	.978	.640	1.496	0.919
Never	313 (70.7%)	96 (71.1%)	ref			
Perspective on family relationships						
Not good	4 (0.9%)	4 (3%)	3.351	.827	13.584	0.090*
Good	439 (99.1%)	131 (97%)	ref			
Perspective on relationships with people other than family members (e.g., friends, colleagues, neighbors)						
Not good	5 (1.1%)	0 (0%)	NA			
Good	438 (98.9%)	135 (100%)	ref			
contracted COVID-19						
Yes	204 (46%)	75 (55.6%)	1.464	.994	2.158	0.054
No	239 (54%)	60 (44.4%)	ref			
Affected by the border war						
Yes	111 (25.1%)	58 (43%)	2.253	1.506	3.371	< 0.001
No	332 (74.9%)	77 (57%)	ref			
Coping style when having stress						
Figure out by oneself	117 (26.4%)	48 (35.6%)	1.537	1.019	2.318	0.040
Ventilates to others	326 (73.6%)	87 (64.4%)	ref			
Total (overall prevalence)	443 (76.6%)	135 (23.3%)				

ref = reference; OR = odds ratio, CI = confidence interval

prevalence rate more than twice as high. In 2020, Chomchoei et al. conducted a study on depression prevalence among the hill tribe population in Chiang Rai province. The study included 2,552 individuals aged over 30 years, of whom 408 were Karen.[6] Their study found an overall depression prevalence of 12%, using the same PHQ-9 cutoff point of 5. Similarly, in 2021, Trongsakul studied depression among elderly Karen individuals in Chiang Rai province, with a total of 174 participants, and reported a prevalence of 11.49%, although a specific PHQ-9 cutoff was not specified.[7] Notably, both studies focused on older age groups than the present study. It is possible that older individuals may have lower rates of depression.

However, some studies have examined depression prevalence in other ethnic groups, reporting varying rates. For example, in northern Thailand, Singkhorn et al. studied hill tribe excluding Karen participants aged over 40 and found a 39.1% prevalence using the PHQ-9 without a specified cutoff.[5] In Vietnam, research on the elderly in

Table 4 Factors associated with depression: Logistic regression model

Factors	Adjusted OR	95% CI		p-value
		lower	upper	
District				
Maesot	6.009	2.293	15.747	< 0.001**
Maeramat	1.955	.718	5.323	.190
Phopphra	3.924	1.536	10.022	< 0.001**
Thasongyang	5.241	2.114	12.998	< 0.001**
Umphang	ref			
Gender				
Female	1.675	1.041	2.694	.034*
Male	ref			
Occupation				
Personal business	2.347	1.465	3.760	< 0.001**
Government officer	.236	.027	2.049	.190
Unemployed	.912	.340	2.445	.855
Agriculture	ref			
Mental disorders				
Yes	13.198	4.086	42.629	< 0.001**
No	ref			
Affected by the border war				
Yes	1.998	1.234	3.235	.005*
No	ref			
Coping style when having stress				
Figure out by oneself	1.885	1.107	3.210	.020*
Ventilates to others	ref			

*p < 0.05, **p < 0.01

the central highlands using the Geriatric Depression Scale reported a prevalence of 25.5%.[12] Similarly, in western China (Yunnan, Guizhou, Sichuan, and Xinjiang), a study on individuals aged over 50 using the GDS-15 found a prevalence of 10.6%.[13] Comparing these studies is challenging due to differences in ethnic groups and assessment tools.

In terms of using the PHQ-9, several studies have opted for different diagnostic principles to identify depressive states and have used different cutoff points. A meta-analysis conducted in South Korea compared the algorithmic and sum methods of scoring PHQ-9, revealing that the sum method is more effective.[14] In this study, the sum scoring method was also employed. Regarding the cutoff points, most studies typically used PHQ-9 cutoff points of nine or ten. However, this study chose a cut-off point of five. This decision served two purposes: first, to compare the results with research conducted on the Karen people in the northern region of the country in different contexts, and second, to examine the relationships of various factors with low-level depressive symptoms in the hope of finding preventive measures.

Factors associated with depression

From the research findings, six factors were identified as associated with depressive symptoms. These

factors include district, sex, occupation, existing mental disorders, experiencing an impact of war, and coping style for stress.

Regarding the first factor, in terms of geographical area, it was observed that compared to Umphang, which had the lowest prevalence rate, Maesot, Thasongyang, and Phopphra had significantly higher prevalence rates. Notably, these three districts were most affected by the consequences of the war. However, further investigation is required to explore the specific factors contributing to the variations among these districts.

The second factor concerned sex, with females having a 1.6 times higher prevalence of depressive symptoms than males. This aligned with WHO data from 2017, which found females more prone to depression.[11] The exact reasons remain uncertain but are believed to involve biological, psychological, and sociocultural factors. Hormones such as estrogen and progesterone play a role in regulating mood-related systems,[15] and women are more likely to engage in emotion-focused and ruminative coping strategies, which may elevate their risk of depression.[16] Additionally, women were more likely than men to develop depression following stressful life events.[17] The third factor pertained to occupation. The study indicated that individuals in business-related occupations, including freelancers, entrepreneurs, and office workers, exhibited a higher correlation with elevated depressive symptom scores than those in the agricultural sector. A systematic review of the work environment and depression conducted by Theorell et al. In 2015 demonstrated that professions characterized by a lack of decision-making latitude, job strain, and prolonged exposure to bullying were more likely to be associated with depression.[18] In particular, individuals with business professions might have a higher likelihood of encountering these factors than those involved in agricultural work, so it could contribute to the higher incidence of depression. However, a study comparing psychological distress between agricultural and non-agricultural professionals in rural areas of China did not find significant differences (31.13% and 30.01%, respectively).[19] Nevertheless, research specifically investigating depression in the agricultural profession remained limited.[20]

The fourth factor involved preexisting mental health conditions. Data from this study indicated that individuals with mental health conditions, including depressive, bipolar, anxiety, and psychotic disorders, might be more prone to experiencing depressive symptoms than the general population. Notably, mental health conditions other than depression might also contribute to a higher likelihood of experiencing depressive symptoms. The prevalence of depression in individuals with generalized anxiety disorder, panic disorder, and posttraumatic stress disorder ranged from approximately 40% to 50%.[21] The pooled prevalence of comorbid depression in schizophrenia was 28.6%.[22] And, around one-fifth of patients with schizophrenia have significant depression during the phase of clinical remission.[23]

The fifth factor was the impact of war, which was significantly correlated with a higher likelihood of depression. Previous studies on the prevalence of depression and posttraumatic stress disorder (PTSD) among war survivors had consistently shown elevated levels of depression.[24] Furthermore, a systematic review found that even more than five years after the war, displaced individuals still exhibited higher rates of depression, PTSD, and anxiety, about 20% on average, compared to the general population.[25]

The final factor related to stress-coping strategies. Individuals who chose to solve problems independently exhibited a higher prevalence of depression than those who ventilated or soughtadvice from others, with an odds ratio of 1.537. This aligned with studies on coping styles, including a 2014 study by Roohafza, which found that active coping strategies, particularly positive reinterpretation and family social support, served as protective factors against depression and anxiety. Conversely, avoidance was identified as a significant factor in the development of depression.[26] Additionally, a 2018 meta-analysis by Heerde focused on the role of help-seeking behavior and social support in psychosocial outcomes, revealing that engaging in help-seeking

behavior within social networks contributed to adaptive coping mechanisms.[27]

Limitations and strengths

To our knowledge, this is the first study on the prevalence and associated factors of depression among the Karen people in Tak Province. The researcher's prolonged engagement in this area provided a comprehensive understanding of regional issues and contexts, facilitating the widespread distribution of surveys throughout the community. However, the context of war and the COVID-19 pandemic contributed to heightened stress levels during data collection. Therefore, caution should be exercised when generalizing these findings under normal circumstances. Moreover, the possibility of reverse causality should be considered when interpreting the associations found in this study. For example, while pre-existing mental disorder, and coping style were identified as risk factors for depression, it is also possible that individuals experiencing depression are more likely to develop other mental disorders or reduced social interactions and adopt different coping strategies. Additionally, the use of lower cut-off points for the PHQ-9 score might contribute to higher observed depression rates, as discussed earlier, overgeneralization should be considered when comparing our findings with other studies. This could be a direction for future studies investigating whether these factors change at higher levels of depressive symptoms. Our findings indicated several practical implications. Targeted interventions were needed for high-risk groups, including women, vulnerable occupations, and war-affected communities, to address specific mental health needs. Routine screening should have been integrated for individuals with pre-existing disorders, while trauma-informed care and PTSD support were essential for those with war experiences. Lastly, promoting adaptive coping strategies through psychoeducation could have strengthened resilience. For policymakers, these findings highlight the need for increased funding, workforce support, culturally and linguistically tailored mental health education, and region-specific policies to improve mental health care accessibility and effectiveness.

CONCLUSIONS

In conclusion, this study revealed a high prevalence of depression among the Karen people in western Tak Province, with rates more than twice those found in northern Thailand. Six factors district, sex, occupation, pre-existing mental disorders, war experience, and coping style were associated with depressive symptoms. This study provided valuable insights into the nature of depression among the Karen population. Future research should explore long-term mental health outcomes and the effectiveness of community-based mental health programs in mitigating depression among this population.

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Conflict of Interest

None

Authors' Contributions

Neshda Nimmawitt: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Validation, Visualization, Roles/Writing - original draft.; Woraphat Ratta-apha: Conceptualization, Methodology, Validation, Supervision, Writing - review & editing.

References

1. Ferrari AJ, Charlson FJ, Norman RE, Patten SB, Freedman G, Murray CJL, et al. Burden of depressive disorders by country, sex, age, and year: Findings from the Global Burden of Disease Study 2010. PLOS Med 2013;10(11):e1001547.
2. Tarricone I, Stivanello E, Poggi F, Castorini V, Marseglia MV, Fantini MP, et al. Ethnic variation in the prevalence of depression

and anxiety in primary care: A systematic review and meta-analysis. Psychiatry Res 2012;195(3):91-106.
3. Gubhaju L, McNamara BJ, Banks E, Joshy G, Raphael B, Williamson A, et al. The overall health and risk factor profile of Australian Aboriginal and Torres Strait Islander participants from the 45 and up study. BMC Public Health 2013;13:661.
4. Rashmi R, Srivastava S, Muhammad T, Kumar M, Paul R. Indigenous population and major depressive disorder in later life: A study based on the data from Longitudinal Ageing Study in India. BMC Public Health 2022;22(1):2258.
5. Singkhorn O, Apidechkul T, Pitchalard K, Moonpanane K, Hamtanon P, Sunsern R, et al. Prevalence of and factors associated with depression in the hill tribe population aged 40 years and older in northern Thailand. Int J Ment Health Syst 2021;15(1):62.
6. Chomchoei C, Apidechkul T, Keawdounglek V, Wongfu C, Khunthason S, Kullawong N, et al. Prevalence of and factors associated with depression among hill tribe individuals aged 30 years and over in Thailand. Heliyon 2020;6(6):e04273.
7. Trongsakul S. Prevalence and associated factors of depression among Karen hilltribe elderly population in Thailand. Malays J Med Health Sci 2021;17:166-9.
8. Zuniga C. "They smile but it's not real": Karen refugees' perceptions of depression. Social Work Theses 2019; 145.
9. Lotrakul M, Sumrithe S, Saipanish R. Reliability and validity of the Thai version of the PHQ-9. BMC Psychiatry 2008;8:46.
10. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 2001;16(9):606-13.
11. World Health Organization. Depression and other common mental disorders: Global health estimates. Available from: https://appswhoint/iris/bitstream/handle/10665/254610/WHO-MSD-MER-20172-engpdf?sequence¼1. 2017.
12. Hoang Lan N, Thi Thu Thuy N. Depression among ethnic minority elderly in the Central Highlands, Vietnam. Health Psychol Open 2020;7(2):2055102920967236.
13. Liu X, Zhao W, Hu F, Hao Q, Hou L, Sun X, et al. Comorbid anxiety and depression, depression, and anxiety in comparison in multi-ethnic community of west China: Prevalence, metabolic profile, and related factors. J Affect Disord 2022;298:381-7.
14. Shin C, Kim Y, Park S, Yoon S, Ko Y-H, Kim Y-K, et al. Prevalence and associated factors of depression in the general population of Korea: Results from the Korea National Health and Nutrition Examination Survey, 2014. J Korean Med Sci 2017;32(11):1861-9.
15. Whitney W, Carey EG, Olson S, Cynthia MC, Sanjay A. Neurobiological underpinnings of the estrogen-mood relationship. Curr Psychiatry Rev 2012;8(3):247-56.
16. Cholankeril R, Xiang E, Badr H. Gender differences in coping and psychological adaptation during the COVID-19 pandemic. Int J Environ Res Public Health 2023;20(2).
17. McLeod GFH, Horwood LJ, Fergusson DM, Boden JM. Life-stress and reactivity by gender in a longitudinal birth cohort at 30 and 35 years. Soc Psychiatry Psychiatr Epidemiol 2016;51(10):1385-94.
18. Theorell T, Hammarström A, Aronsson G, Träskman Bendz L, Grape T, Hogstedt C, et al. A systematic review including meta-analysis of work environment and depressive symptoms. BMC Public Health 2015;15(1):738.
19. Feng D, Ji L, Xu L. Effect of subjective economic status on psychological distress among farmers and non-farmers of rural China. Aust J Rural Health 2015;23(4):215-20.
20. Hagen BNM, Albright A, Sargeant J, Winder CB, Harper SL, O'Sullivan TL, et al. Research trends in farmers' mental health: A scoping review of mental health outcomes and interventions among farming populations worldwide. PLOS ONE 2019;14(12):e0225661.
21. Kalin NH. The critical relationship between anxiety and depression. Am J Psychiatry 2020;177(5):365-7.
22. Li W, Yang Y, An F-R, Zhang L, Ungvari GS, Jackson T, et al. Prevalence of comorbid depression in schizophrenia: A meta-analysis of observational studies. J Affect Disord 2020;273:524-31.
23. B NS, Grover S. Depression in schizophrenia: Prevalence and its impact on quality of life, disability, and functioning. Asian J Psychiatr 2020;54:102425.
24. Morina N, Stam K, Pollet TV, Priebe S. Prevalence of depression and posttraumatic stress disorder in adult civilian survivors of war who stay in war-afflicted regions: A systematic review and meta-analysis of epidemiological studies. J Affect Disord 2018;239:328-38.
25. Bogic M, Njoku A, Priebe S. Long-term mental health of war-refugees: A systematic literature review. BMC Int Health Hum Rights 2015;15(1):29.
26. Roohafza HR, Afshar H, Keshteli AH, Mohammadi N, Feizi A, Taslimi M, et al. What's the role of perceived social support and coping styles in depression and anxiety? J Res Med Sci 2014;19(10):944-9.
27. Heerde JA, Hemphill SA. Examination of associations between informal help-seeking behavior, social support, and adolescent psychosocial outcomes: A meta-analysis. Dev Rev 2018;47:44-62.