

## Factors Associated with Depression, Anxiety, and Stress among Prisoners in Central Thailand

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### Abstract

Mental health problems among prisoners are a major public health concern and contribute to adverse psychological, social, and rehabilitation outcomes. Depression, anxiety, and stress are highly prevalent in correctional settings; however, evidence regarding associated factors among Thai prisoners remains limited. This study aimed to determine the prevalence of depression, anxiety, and stress and to examine their associated sociodemographic and health-related factors among prisoners in Central Thailand. A cross-sectional analytic study was conducted among 245 prisoners recruited through multi-stage sampling from four prisons in Central Thailand. Sociodemographic and health-related characteristics were collected using a structured questionnaire. Psychological distress was assessed using the validated Thai version of the Depression Anxiety Stress Scale-21 (DASS-21). Descriptive statistics were used to summarize participant characteristics and prevalence rates. Multivariable ordinal logistic regression analysis identified factors associated with symptom severity. Statistical significance was set at  $p < 0.05$ . The findings showed that mild-to-moderate symptoms were reported in 15.1% of participants for anxiety, 16.3% for stress, and 21.2% for depression. Participation in music activities was associated with higher anxiety severity (OR = 7.02, 95% CI: 1.13 - 43.48). Increasing age was associated with lower stress severity (OR = 0.96, 95% CI: 0.93 - 0.99) and depression severity (OR = 0.97, 95% CI: 0.94 - 0.99). Higher educational attainment (OR = 0.50, 95% CI: 0.26 - 0.95) and receiving family visits (OR = 0.56, 95% CI: 0.34 - 0.93) were protective factors against stress, whereas chronic disease increased the likelihood of stress (OR = 2.21, 95% CI: 1.11 - 4.42) and depression (OR = 1.87, 95% CI: 1.02 - 3.43). These findings suggest that psychological distress among prisoners is influenced by sociodemographic conditions, chronic health problems, and social support factors. Integrating routine mental health screening with interventions that strengthen chronic disease management, educational engagement, and family support may improve mental health outcomes and rehabilitation effectiveness in correctional settings.

**Keywords:** Anxiety, Depression, Mental health, Prisoners, Stress

## Introduction

Mental health problems among prisoners have emerged as a critical public health concern worldwide. Correctional environments are inherently restrictive and stressful, characterized by loss of autonomy, separation from family, overcrowding, rigid institutional regulations, and limited access to social and health resources. Such conditions create sustained psychological strain, rendering incarcerated individuals a highly vulnerable population. Common mental health problems in prisons include stress, anxiety, and depression—conditions that reflect both psychological and physiological responses to prolonged exposure to environmental adversity. The severity and manifestation of these symptoms vary according to individual psychological characteristics, emotional regulation capacity, social support systems, cultural background, and contextual environmental factors (Department of Mental Health, 2018; Nosu, 2023).

Thailand has one of the largest prison populations worldwide. According to the Institute for Criminal Policy Research (ICPR, 2023), Thailand ranks among the countries with the highest incarceration rates globally. Persistent prison overcrowding and limited mental health resources have placed considerable pressure on correctional health systems. National reports indicate that nearly half of Thai prisoners experience some form of mental health problem or psychiatric disorder (Department of Mental Health, 2018). Untreated psychological distress among prisoners may negatively affect rehabilitation outcomes, increase behavioral problems, and contribute to higher recidivism rates.

Mental health problems in correctional settings are influenced by multiple individual and environmental factors. Individual determinants include age, educational attainment, chronic disease, coping capacity, and previous life experiences (Nosu, 2023). Environmental determinants include overcrowding, limited healthcare access, prolonged legal uncertainty, and reduced social support. Social isolation and separation from family members are particularly important contributors to emotional distress among incarcerated populations. Conversely, social support and structured activities may enhance coping and psychological adaptation (Department of Corrections, 2020).

The consequences of untreated psychological distress extend beyond emotional suffering. Chronic psychological distress may negatively affect physical health, emotional regulation, coping capacity, and social functioning, thereby increasing vulnerability to poor rehabilitation outcomes. These changes are associated with insomnia, fatigue, immunosuppression, and an increased risk of chronic diseases (World Health Organization, 2023a; Aekwarangkoon, 2021). Psychologically, dysregulation of monoamine neurotransmitters contributes to depressive symptoms, hopelessness, and impaired coping ability. Severe cases may involve suicidal ideation or self-harm behavior (World Health Organization, 2003a; Fazel et al., 2016). Socially, mental health problems reduce interpersonal functioning, increase the risk of aggression, and hinder successful reintegration into society (ICPR, 2023).

Although prison health systems in Thailand implement mental health screening and treatment according to national guidelines (Department of Corrections, 2008; 2022), services primarily emphasize psychiatric diagnosis and crisis management. Proactive mental health promotion and systematic examination of associated determinants remain limited. Recent national reports continue

to indicate increasing trends in psychological distress among prisoners (Department of Mental Health, 2023), underscoring the need for comprehensive evidence to inform policy and practice.

Despite increasing attention to prisoners' mental health in Thailand, important knowledge gaps remain. Most previous studies have focused on specific prisoner subgroups, such as women inmates, prisoners with substance use disorders, or inmates within a single correctional institution, limiting the generalizability of findings (Sunpuwan et al., 2024). Furthermore, many studies have primarily reported prevalence estimates without simultaneously examining depression, anxiety, and stress using multivariable analytical approaches capable of identifying independent determinants. Consequently, evidence on the relative contributions of sociodemographic characteristics, chronic health conditions, prison-related activities, and social support remains limited. This study extends existing knowledge by investigating multiple dimensions of psychological distress and their associated factors among prisoners recruited from four prisons in Central Thailand, thereby providing broader evidence to support correctional mental health policy and intervention development.

## **Methodology**

### **Research design**

This cross-sectional analytic study was conducted in four prisons in Central Thailand.

### **Participants and sampling**

The sample size was calculated using Cochran's formula for estimating population proportions. Based on a previous study reporting a prevalence of depression of 18.5% among prisoners (Malik et al., 2019), a 95% confidence level and a margin of error of 0.05 were used, resulting in a required sample size of 232 participants. To compensate for potential incomplete responses, an additional 5% was added. The final sample size of 245 participants was considered adequate for the planned multivariable regression analyses. Contemporary methodological guidance suggests that sample size adequacy should be evaluated based on the total sample size, outcome prevalence, and model complexity rather than relying solely on the traditional rule of 10 events per predictor variable. Given the prevalence of depression, anxiety, and stress observed in this study and the limited number of predictors included in the final models, the available sample was considered sufficient to support stable parameter estimation and minimize the risk of model overfitting (Van Smeden et al., 2019).

Participants were recruited using a multi-stage sampling procedure. In the first stage, a total of 12 provincial prisons were listed in Central Thailand. Four prisons were selected using a computer-generated random sampling procedure. Within each selected prison, eligible prisoners were identified from prison records and recruited in proportion to each prison's population. In the second stage, trained research assistants screened prisoners according to the inclusion and exclusion criteria. Eligible prisoners were informed about the study objectives and procedures and were invited to participate voluntarily. Written informed consent was obtained from all participants prior to data collection. Inclusion criteria included: (1) aged 18 years or older, (2) currently incarcerated, and (3)

able to read and understand the Thai language. Prisoners with severe cognitive impairment or acute psychiatric instability were excluded from the study.

### **Instruments**

1. Sociodemographic Questionnaire: The questionnaire collected information regarding age, sex, education level, marital status, incarceration duration, chronic diseases, prison activities, and family visits.

2. Depression Anxiety Stress Scale (DASS-21): Psychological distress was assessed using the validated Thai version of the 21-item DASS-21. The scale measures depression, anxiety, and stress symptoms across three subscales. Each item is rated on a 4-point Likert scale. Scores were categorized into severity levels according to the DASS-21 manual: Depression (normal 0 - 9, mild 10 - 13, moderate 14 - 20, severe 21 - 27, extremely severe  $\geq 28$ ), anxiety (normal 0 - 7, mild 8 - 9, moderate 10 - 14, severe 15 - 19, extremely severe  $\geq 20$ ), and stress (normal 0 - 14, mild 15 - 18, moderate 19 - 25, severe 26 - 33, extremely severe  $\geq 34$ ).

### **Ethical consideration**

This study was approved by the Human Research Ethics Committee of Walailak University (Approval No. WUEC-25-305-01). The researchers ensured the protection of participants' rights in accordance with the three fundamental ethical principles of respect for persons, beneficence, and justice. Participants' autonomy was respected by providing them with clear and comprehensive information regarding the research objectives, study procedures, research instruments, and their rights as research participants. Participation in the study was entirely voluntary. Participants were informed of their right to decide whether to participate and to withdraw from the study at any time without penalty or negative consequences. During the research process, participants might have experienced fatigue or discomfort. If such situations occurred, participants were allowed to inform the researcher to reschedule or adjust the timing of data collection. Participants had the right to discontinue participation at any stage of the study. Written informed consent was obtained after participants had received sufficient explanation and demonstrated understanding of the study.

### **Data collection**

After receiving institutional approval, eligible participants were informed about the study and provided written consent. Questionnaires were completed anonymously under the researcher's supervision.

### **Data analysis**

Descriptive statistics were used to summarize participant characteristics and prevalence rates of depression, anxiety, and stress. Multivariable ordinal logistic regression analyses were used to estimate odds ratios (ORs) with 95% confidence intervals (CIs) and to identify factors associated with mental health problems. Statistical significance was set at  $p < 0.05$ .

## Results and discussion

### Results

A total of 245 prisoners participated in the study. The majority were male (77.1%) and aged 19 - 39 years (60.4%), with a mean age of 37.96 years (SD = 12.45). Most participants had completed secondary education (60.8%), reported no chronic disease (79.2%), and were convicted primarily of property-related offenses (59.2%). Approximately 42.4% received regular family visits during incarceration. Regarding prison-related activities, 66.9% had work responsibilities, while 48.2% participated in leisure activities. The prevalence of mild-to-moderate anxiety symptoms was 15.1%, whereas severe anxiety symptoms were reported by 4.1% of participants. Mild-to-moderate stress symptoms were reported by 16.3%, and severe stress symptoms by 2.5%. Mild-to-moderate depressive symptoms were identified in 21.2% of participants, while severe depressive symptoms were reported by 4.1%. Depressive symptoms demonstrated the highest prevalence among the three psychological conditions assessed (**Table 1**).

**Table 1** Sociodemographic characteristics and mental health status of participants (N = 245).

Variables	n	%
<b>Sex</b>		
Male	189	77.1
Female	56	22.9
<b>Age Group</b> (years) Mean age = 37.96 years (SD = 12.45)		
19 - 39 years	148	60.4
≥ 40 years	97	39.6
<b>Marital Status</b>		
Single	171	69.8
Married/Other	74	30.2
<b>Occupation Before Incarceration</b>		
Employee/Laborer	141	57.6
Other occupations	104	42.4
<b>Educational Attainment</b>		
Primary education or lower	96	39.2
Secondary education or higher	149	60.8
<b>Presence of Chronic Disease</b>		
	51	20.8
<b>Type of Offense</b>		
Property-related offenses	145	59.2
Other offenses	100	40.8

Variables	n	%
<b>Sentence Length</b>		
1 - 5 years	129	52.7
> 5 years	116	47.3
Family Regular Visits During Incarceration	104	42.4
Prison Work Responsibility	164	66.9
Participation in Leisure Activities	118	48.2
Music Activity Participation	15	6.1
Reading Activity Participation	69	28.2
Sports Participation	31	12.7
Regular Exercise	62	25.3
<b>Mental Health Status (DASS-21)</b>		
Mild-Moderate Anxiety	37	15.1
Severe Anxiety	10	4.1
Mild-Moderate Stress	40	16.3
Severe Stress	6	2.5
Mild-Moderate Depression	52	21.2
Severe Depression	10	4.1

### Factors associated with mental health problems

The multivariable analyses demonstrated that several sociodemographic and health-related factors were significantly associated with mental health severity among prisoners. Increasing age was independently associated with lower stress severity (adjusted OR = 0.96, 95% CI: 0.93 - 0.99,  $p = 0.021$ ) and lower depression severity (adjusted OR = 0.97, 95% CI: 0.94 - 0.99,  $p = 0.019$ ). Prisoners with secondary education or higher had significantly lower odds of experiencing more severe stress symptoms than those with primary education or lower (adjusted OR = 0.50, 95% CI: 0.26 - 0.95,  $p = 0.034$ ).

In contrast, the presence of a chronic disease was associated with increased stress severity (adjusted OR = 2.21, 95% CI: 1.11 - 4.42,  $p = 0.024$ ) and depression severity (adjusted OR = 1.87, 95% CI: 1.02 - 3.43,  $p = 0.042$ ). Regular family visits during incarceration were associated with reduced stress severity (adjusted OR = 0.56, 95% CI: 0.34 - 0.93,  $p = 0.026$ ), suggesting a protective role of social support. Participation in music activities was associated with higher anxiety severity (adjusted OR = 7.02, 95% CI: 1.13 - 43.48,  $p = 0.036$ ). However, the relatively wide confidence interval indicates considerable uncertainty around the estimate, which may be attributable to the small number of participants involved in music activities. Detailed results of the multivariable ordinal logistic regression analyses are presented in **Table 2**.

**Table 2** Factors associated with anxiety, stress, and depression severity among prisoners: Multivariable ordinal logistic regression analysis (N = 245).

Outcomes	Predictors	B	Adjusted OR	95% CI	p-value
Anxiety	Music activity participation	1.965	7.02	1.13 - 43.48	0.036*
Stress	Age	-0.036	0.96	0.93 - 0.99	0.021*
	Secondary education or higher	-0.693	0.50	0.26 - 0.95	0.034*
	Presence of chronic disease	0.603	2.21	1.11 - 4.42	0.024*
	Regular family visits	-0.583	0.56	0.34 - 0.93	0.026*
Depression	Age	-0.030	0.97	0.94 - 0.99	0.019*
	Presence of chronic disease	0.350	1.87	1.02 - 3.43	0.042*

Note: OR = odds ratio; CI = confidence interval. Adjusted ORs were obtained from multivariable ordinal logistic regression models. Reference categories were no participation in music activities, primary education or lower, absence of chronic disease, and no regular family visits,  $p < 0.05$ .

## Discussion

This study demonstrated that depression, anxiety, and stress are common among prisoners in Central Thailand. Depressive symptoms showed the highest prevalence among the three psychological conditions assessed. These findings are consistent with international evidence indicating elevated psychological distress among incarcerated populations (Fazel et al., 2016; World Health Organization, 2023b).

### *Age and psychological vulnerability*

Increasing age was inversely associated with both stress and depression severity. Younger prisoners may experience greater psychological disruption due to their developmental stage, reduced coping capacity, and greater perceived loss of social and occupational roles. Prior research suggests that younger incarcerated individuals demonstrate higher emotional reactivity and poorer adaptive regulation in restrictive environments (ICPR, 2023; Fazel et al., 2016). This finding is consistent with international evidence indicating that younger prisoners are at greater risk of psychological distress and emotional maladjustment than older prisoners.

### ***Education as a protective factor***

Higher educational attainment was associated with lower stress severity. Education may enhance cognitive appraisal capacity, self-efficacy, and adaptive coping strategies. According to stress appraisal theory (Lazarus & Folkman, 1984), individuals with greater cognitive resources are more likely to perceive stressors as manageable, thereby reducing their psychological impact. Similar protective effects of education have been reported in prison mental health studies and broader public health research, where higher educational attainment is associated with better coping skills and psychological well-being (Durlak et al., 2011).

### ***Chronic disease and psychological burden***

Chronic disease significantly increased both stress and depression severity. This finding supports biopsychosocial models linking chronic physical illness with emotional dysregulation and depressive symptomatology. Chronic inflammatory processes, neuroendocrine dysregulation, and functional limitations may contribute to increased psychological vulnerability (World Health Organization, 2023b). Within correctional settings, limited healthcare autonomy and concerns regarding disease management may further exacerbate psychological distress. Similar associations between chronic illness and poor mental health outcomes have been reported among incarcerated populations in several countries.

### ***Family support as a protective buffer***

Regular family visits were associated with lower stress severity. Social support theory posits that emotional connection and perceived belonging buffer stress responses (Taylor et al., 2017). In restrictive institutional environments, family visits may help preserve identity continuity, enhance perceived social worth, and reduce feelings of isolation. This finding is consistent with previous studies demonstrating that social connectedness and family support are associated with better mental health outcomes among prisoners (Sunpuwan et al., 2024).

### ***Music activity and anxiety***

Participation in music activities was associated with higher anxiety severity among prisoners. However, this finding should be interpreted with caution. The wide confidence interval indicates substantial uncertainty around the estimated association and may reflect the relatively small number of participants involved in music-related activities. Therefore, the observed relationship should not be interpreted as evidence of a causal effect. Several explanations may account for this association. Prisoners experiencing higher levels of anxiety may be more likely to engage in structured recreational or expressive activities, such as music programs, as a coping mechanism for emotional distress. Alternatively, participation in music activities may facilitate emotional expression and self-reflection, leading individuals to become more aware of their psychological symptoms and, consequently, to report them more readily. Similar observations have been reported in previous intervention studies, which suggest that socio-emotional programs can enhance emotional awareness

and expression while supporting longer-term psychological adjustment and emotional regulation (Granados et al., 2023). Given the cross-sectional design of the present study, the temporal relationship between participation in music activities and anxiety cannot be determined. Reverse causation, therefore, remains a plausible explanation, and further longitudinal research is needed to clarify this relationship.

The present findings are consistent with a growing body of international evidence demonstrating that psychological distress among prisoners is influenced by a complex interplay of demographic, health-related, and social factors. Similar studies conducted in the United Kingdom, Australia, China, and several European countries have reported that younger prisoners are more likely to experience symptoms of depression, anxiety, and stress, whereas older individuals tend to demonstrate greater emotional adaptation and coping capacity within correctional environments (Cooper & Berwick, 2001; Di Lorito et al., 2018). Likewise, chronic physical illness has consistently been identified as a significant risk factor for poor mental health outcomes among incarcerated populations, reflecting the interconnected nature of physical and psychological well-being (Favril et al., 2024). The protective role of family support observed in this study is also supported by international literature (De Claire & Dixon, 2017; Machado et al., 2024). Social connectedness, family contact, and perceived emotional support have been shown to reduce psychological distress and promote resilience among prisoners. Recent systematic reviews further emphasize the importance of integrated mental health services that address both psychosocial and physical health needs, while strengthening supportive social relationships within correctional settings. Collectively, these findings reinforce the need for comprehensive, person-centered mental health strategies that address individual vulnerabilities, chronic health conditions, and social support systems to improve psychological well-being among incarcerated populations.

### **Strengths and limitations**

This study has several notable strengths. First, it examined depression, anxiety, and stress simultaneously, providing a comprehensive assessment of psychological distress among prisoners rather than focusing on a single mental health outcome. Second, participants were recruited from four prisons in Central Thailand using a multi-stage sampling approach, thereby enhancing sample diversity and improving the representativeness of the findings compared with studies conducted at a single correctional institution. Third, the study employed the validated Thai version of the Depression Anxiety Stress Scale-21 (DASS-21), a widely recognized instrument with established psychometric properties for assessing psychological distress. Fourth, multivariable ordinal logistic regression was used to identify independent factors associated with varying symptom severity levels while controlling for potential confounders, thereby strengthening the validity of the findings.

Several limitations should also be considered when interpreting the results. First, the cross-sectional design precludes conclusions regarding causal relationships between the identified factors and mental health outcomes. Consequently, the observed associations should be interpreted as correlational rather than causal. Second, data were collected via self-report questionnaires, which may

be subject to recall and social desirability biases, potentially leading to under- or overreporting of psychological symptoms and personal experiences. Third, although the study included participants from multiple prisons, all facilities were located in Central Thailand; therefore, the findings may not be fully generalizable to prisoners in other regions of the country or to different correctional systems. Fourth, several potentially important determinants of mental health, such as previous psychiatric history, substance use disorders, childhood adversity, social support quality, prison overcrowding, and institutional environmental factors, were not assessed and may have influenced the observed outcomes. Finally, the association between participation in music activities and anxiety should be interpreted with caution because the number of participants was relatively small, resulting in a wide confidence interval and reduced precision of the estimated effect. Despite these limitations, the study provides valuable evidence regarding the prevalence and determinants of psychological distress among prisoners in Thailand and contributes to the growing body of literature supporting comprehensive mental health promotion and intervention strategies within correctional settings.

### **Implications for clinical practice**

The findings of this study have several important implications for correctional healthcare practice. First, routine mental health screening should be integrated into prison healthcare services to facilitate the early identification of depression, anxiety, and stress among incarcerated individuals. Standardized screening tools such as the DASS-21 may assist healthcare providers in identifying prisoners at increased risk of psychological distress and enabling timely referral and intervention. Second, particular attention should be directed toward prisoners with chronic diseases, as they demonstrated significantly higher levels of stress and depression. Integrating mental health assessment and support into chronic disease management programs may help address the interconnected physical and psychological needs of this population. Collaborative care approaches involving nurses, physicians, psychologists, and correctional staff may improve overall health outcomes and quality of life. Third, the protective effects of educational attainment suggest that educational and skill-development programs may contribute not only to rehabilitation but also to psychological well-being. Correctional institutions should consider expanding access to educational opportunities, health literacy programs, and coping-skills training to enhance prisoners' resilience and adaptive capacity. Fourth, family support emerged as an important protective factor against psychological distress. Correctional healthcare systems should therefore promote family-centered approaches that facilitate regular communication and contact between prisoners and their families. Strategies such as family visitation programs, virtual communication platforms, and family engagement initiatives may strengthen social support and reduce emotional distress during incarceration. Finally, younger prisoners may require targeted mental health interventions because they appear to be more vulnerable to stress and depressive symptoms. Age-specific mental health promotion programs focusing on emotional regulation, coping strategies, and resilience-building may be particularly beneficial for this group. Collectively, these findings support implementing

comprehensive, multidisciplinary, and person-centered mental health services that address both individual and environmental determinants of psychological well-being in correctional settings.

### Conclusions

Mental health problems remain a significant public health concern among prisoners in Central Thailand, with depression, anxiety, and stress affecting a substantial proportion of incarcerated individuals. The findings indicate that psychological distress is influenced by a combination of demographic, health-related, and social factors. Younger age and the presence of chronic disease were associated with greater psychological vulnerability, whereas higher educational attainment and regular family support appeared to play protective roles. These findings highlight the importance of adopting a comprehensive and person-centered approach to mental health care within correctional settings. Routine mental health screening, integrated chronic disease management, educational support programs, and strategies that strengthen family connectedness should be incorporated into correctional healthcare services. Addressing both psychosocial and physical health needs may contribute to improved psychological well-being, support successful rehabilitation, and enhance reintegration outcomes among incarcerated populations. Future research using longitudinal and multi-center designs is recommended to further examine causal relationships and evaluate the effectiveness of interventions aimed at improving mental health among prisoners.

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