**The prevalence and correlates of substance use disorders among patients of two different treatment settings in Thailand**

Supa Pengpid[1,2] and Karl Peltzer[3]


[1]ASEAN Institute for Health Development, Mahidol University, Salaya, Phutthamonthon, Nakhon Pathom, Thailand

[2]Department of Research Administration and Development, University of Limpopo, Turfloop, South Africa

[3]Department of Psychology, University of the Free State, Bloemfontein, South Africa


Corresponding author at: Karl Peltzer, University of the Free State, Bloemfontein, South Africa; Email: kfpeltzer@gmail.com

## Abstract

**Background:** Monk healers provide an accessible and popular service in Southeast Asia, but little is known on the substance use status of their clients. This investigation intended to assess and compare the rate and correlates of substance use disorders in two different treatment settings (monk healers=MH and primary health care=PHC) in Thailand.

**Methods**: In a cross-sectional study, 1024 patients (591 of MH and 613 of PHC) responded to screening measures of the "World Health Organization Alcohol, Smoking, and Substance Involvement Screening Test Lite", and two common mental disorders (major depression and generalized anxiety disorder) from November 2018 to February 2019. Logistic regression was used to estimate the determinants of any substance use disorder in the MH and PHC setting.

**Results**: The prevalence of substance use disorder was higher in MH clients than PHC patients: any substance use disorder 11.7% (95% Confidence Interval-CI: 9.3%-14.5%) vs 5.4% (95% CI: 3.9%-7.5%), tobacco use disorder 7.6% (95% CI: 5.7%-9.9%) vs 2.5% (95% CI: 1.5%-4.0%), alcohol use disorder 10.0% (95% CI: 8.4%-13.6%) vs 4.3% (95% CI: 3.0%-6.3%), any drug use disorder 4.2% (95% CI: 2.8%-6.1%) vs 0.3% (95% CI: 0.08%-1.3%), and any past three months drug use 8.2% (95% CI: 6.2%-10.7%) vs 1.5%, 95% CI: 0.8%-2.8%). In adjusted logistic regression analysis, among MH clients, male sex (Adjusted Odds Ratio-AOR: 9.52, 95% Confidence Interval-CI: 5.06-17.92) was positively, and were married (AOR: 0.32, 95% CI: 0.16-0.61) and high social support (AOR: 0.40, 95% CI: 0.16-0.99) were negatively associated with any substance use disorder. Among PHC patients, male sex (AOR: 7.05, 95% CI: 2.99-16.63) was positively and age (AOR: 0.95, 95% CI: 0.92-0.98) was negatively associated with any substance use disorder.

**Conclusion**: The proportion of substance use disorders among MH attendees was more than twice that of PHC attenders in Thailand, calling for collaboration in controlling substance use disorders between the two treatment systems.

**Key words**: Substance use disorders, different treatment settings, Thailand

## Introduction

Globally, traditional health practitioners (THP) have been shown to contribute to mental health services.[1] An earlier review described the potential benefits of traditional healing in the prevention and treatment of substance use disorders,[2] and in a more recent evidence review on complementary medicine in treating substance use disorders showed that mind-body interventions, herbal therapies and acupuncture demonstrated promising results.[3] Hai et al.[4] found in a systematic review, evidence of the efficacy of spiritual/religious interventions for substance use disorders.

Monk healers (MH) or THP have been described of providing treatment for substance use disorders in Thailand,[5,6] in Malawi,[7] in South Africa,[8] and in the Americas.[2] For example, in the Buddhist monastery Wat Tham Krabok in central Thailand, a traditional treatment programme for substance use disorders includes Buddhist religious principles, traditional herbal medicine and physical therapy.[5] The Thamkrabok substance abuse treatment programme has been in operation since 1959, and has a monthly intake of 300-400 addicts.[6] THP and MH operate in various locations in Thailand,[3] making use of different treatment modalities, such as herbal medicines and prayers.[10-12]

In a study among THP attenders in Kenya, the prevalence of alcohol misuse was 9%.[13] In a national survey in South Africa, the use of THP was predicted by those who had a substance use disorder.[14] Several studies on the prevalence of common mental disorders but not substance use disorders in the THP setting were carried out in Africa.[15-17] For example in urban Tanzania, the proportion of common mental disorders of THP clients was 48% and 24% among PHC patients.[16] Based on this study, we hypothesised that the prevalence of substance use disorder would be higher in MH clients than PHC attendees.

Studies reporting the prevalence of substance use disorders in Thailand include 5.6% prevalence of any substance use disorder in Bangkok, Thailand,[18] 33.0% of moderate to high risk substance use in primary care in southern Thailand,[19] and 31.1% moderate or high risk of alcohol or tobacco use among men attending district hospitals in central Thailand.[20] In other countries, the prevalence of 12-month any substance use disorder in primary care ranged from 3.2% in Spain[21] to 35.8% in USA.[22] In Nepal one in every 14 (7.5%) primary care users had an alcohol use disorder.[23] In the USA, in urban primary care, the prevalence of moderate-to high-risk tobacco use was 15.3%; alcohol use 8.5%, cannabis use 5.1%, cocaine use 2.5% and opioid use 2.5%.[24] Correlates of substance use disorder in primary care, include male

sex,[23,25] lower education,[20] younger age,[20] being separated, divorced or widowed,[20] co-occurrence of depression or anxiety disorder,[26] chronic conditions,[27] not obese and not having diabetes. [20]

There are no studies on the prevalence of substance use disorders in the THP setting in comparison to the PHC setting in Asia. Consequently, this study aimed to assess the rate and correlates of substance use disorders among MH or PHC attendees in Thailand.

## Methods

### Study design and participants

In all, 1024 adult MH or PHC patients (age range: 19-93 years) were consecutively recruited into the cross-sectional study from November 2018 to February 2019; response rate 97%. Three MH and three PHC, inclusion criteria, 5 or more attendees a day, were purposefully sampled from two regions of Thailand. MH and PHC attendees inclusion criteria were able to comprehend Thai language, willingness to provide informed consent, and aged 18 years and older.

Sample size calculation. Using the assumptions of the prevalence of substance use disorder of 5.6% (based on a previous study),[18] in the health care setting and 5% higher, we predicted 10.6% in the monk healers setting (5.6+10.6/ 2 = 8%) cluster = 3; confidence interval =95% acceptable margin of error 3%, minimum cluster size =105 and minimum sample size is 315. In this study, we collected more than 590, which is greater than the minimum sample size.

Trained professional nurses collected background data and substance use disorders in all study sites using interviews with structured questionnaires in Thai language that had previously been pretested for validity. The study protocol received approval by the "Office of The Committee for Research Ethics (Social Sciences), Mahidol University (No.: 2017/055.1403)", and written informed consent was obtained from all participants.

### Measures

The "*Ultrarapid Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST-Lite)*" optimized for general medical settings was used to assess substance use disorders.[32] ASSIST-Lite asked the past 3 months use of psychoactive substances, specifically, "smoking tobacco, alcohol, cannabis, amphetamine-type stimulants (or cocaine or a stimulant medication not as prescribed), sedatives (or sleeping medication not as

prescribed), and street opioids (or an opioid containing medication not as prescribed)."[32] "For each substance there are two (or three, for alcohol) questions to determine level of use, and the ASSIST-Lite scores them as follows: Not used in the past 3months (0); l Used, but no other questions positive (1); l Used and either question positive (2); l Used and both questions positive (3). The cutoff score for a likely substance use disorder is 2, and for alcohol use disorder 3."[32] The ASSIST-Lite has been validated in several western and eastern cultures, including Thailand.[32] Cronbach alpha of the ASSIST-Lite was 0.90 in the current study sample.

*Major depressive disorder* was assessed with the in Thailand validated "*Patient Health Questionnaire-9* (PHQ-9)."[33,34] Cronbach's alpha of the PHQ-9 was 0.88 in this sample.

*General anxiety disorder* was measured with the "Generalized anxiety disorder 7-item=GAD-7)." Cronbach's alpha of the GAD-7 was 0.92 in this study sample.

*Social network support* was sourced from the "*Oslo 3-items Social Support Scale (OSSS-3)",* covering "the number of people the respondent feels close to, the interest and concerns shown by others, and the ease of obtaining practical help from others."[28] Summed scores were classified into "3-8=poor, 9-11,=moderate, and 12-14 strong support."[28] Cronbach's alpha of the OSSS-3 was 0.75 in the current study sample.

Chronic conditions. Clients were asked about 13 health care providers diagnosed chronic conditions, as used in previous surveys in primary care and traditional and complementary medicine settings.[29-31] Chronic conditions included: cancer or a malignancy of any kind (malignant neoplasms), diabetes or blood sugar, emphysema/asthma, heart attack or angina, high blood cholesterol, hypertension or high blood pressure, osteoporosis, sore joints, migraine headaches, ulcer (a stomach, duodenal or peptic ulcer), fatigue disorder, sleeping problem, and stroke.

*Sociodemographic information* comprised extent of debt, highest level of education, religion, employment status, age, and gender.

## Statistical analysis

"IBM-SPSS for Windows, version 25 (Chicago, IL, USA)" was used to analyse the data. Apart from descriptive statistics, Pearson chi-square and Fisher's exact tests were applied for differences in proportions, and Student's t test for differences in means. Univariate and multivariable logistic regression analyses were utilized to estimate the determinants of

substance use disorders by type of treatment setting. Co-variates included age, sex, education, marital status, debt, social support, chronic conditions, and major depressive and/or generalized anxiety disorder. Variables significant at $p<0.05$ in univariate analysis formed part of the final model.

## Results

### Participants characteristics

The sample comprised of 1204 participants, 613 (50.9%) from PHC and 591 (49.1%) from MH. All MH and PHC attendees were Buddhists and the majority were women. MH attendees had higher education, higher social support, less debt, younger, less likely married, and were more likely to have common mental disorders than PHC attendees (see Table 1).

### Prevalence of substance use disorder

The proportion of any substance use disorder was significantly higher in MH clients (11.7%, 95% Confidence Interval-CI: 9.3%-14.5%) than PHC patients (5.4%, 95% CI: 3.9%-7.5%) (P<0.001). Similarly, the proportion of each substance use disorder was significantly higher in MH clients (tobacco use disorder 7.6%, 95% CI: 5.7%-9.9%, alcohol use disorder 10.0%, 95% CI: 8.4%-13.6% any drug use disorder 4.2%, 95% CI: 2.8%-6.1%, and any past three months drug use 8.2%, 95% CI: 6.2%-10.7%) than in PHC patients (tobacco use disorder 2.5%, 95% CI: 1.5%-4.0%, alcohol use disorder 4.3%, 95% CI: 3.0%-6.3%, any drug use disorder 0.3%, 95% CI: 0.08%-1.3% and any past three months drug use 11.5%, 95% CI: 0.8%-2.8%) (see Table 2).

### Univariate association with any substance use disorder

In the univariate logistic regression analysis, among MH clients, male sex was positively, and age, being widowed, divorced, or single and high social network support were negatively associated with any substance use disorder. Among PHC patients, male sex was positively and age was negatively associated with any substance use disorder (see Table 3).

### Multivariable association with any substance use disorder

In adjusted logistic regression analysis, among MH clients, male sex (Adjusted Odds Ratio-AOR: 9.52, 95% Confidence Interval-CI: 5.06-17.92) was positively, and were married

(AOR: 0.32, 95% CI: 0.16-0.61) and high social support (AOR: 0.40, 95% CI: 0.16-0.99) were negatively associated with any substance use disorder. Among PHC patients, male sex (AOR: 7.05, 95% CI: 2.99-16.63) was positively and age (AOR: 0.95, 95% CI: 0.92-0.98) was negatively associated with any substance use disorder (see Table 4).

## Discussion

The study found that the prevalence of any substance use disorder among MH attenders was more than twice that of PHC attenders, confirming our study hypothesis. The prevalence of alcohol use disorder in the MH setting (10.0%) was similar to what was found among THP attendees in Kenya (9%).[13] The prevalence of any substance use disorder in the PHC setting in this study (5.4%) was similar to a community-based study in Bangkok, Thailand (5.6%),[18] was higher than among PHC users in Spain (3.2%),[21] but seems lower than what was found in a study among health care attendees in Southern Thailand (33.0% moderate-high risk substance use),[19] among male out-patients in central Thailand (31.1% moderate or high risk alcohol or tobacco use),[20] and PHC patients in USA (35.8%).[22] The higher prevalence of substance use problems in the study in southern Thailand may be explained by the selection of the health care sites (district hospital and primary care centres) in areas known to have high substance use problems,[19] and in the study in central Thailand only male patients attending district hospitals were included,[20] with men expected to have a higher prevalence of substance use disorder than women. The prevalence of alcohol use disorder in the PHC setting in this study (4.3%) was lower than in a study among PHC users in Nepal (7.5%)[23] and in USA (8.5%).[24] The two major substances abused in this study were alcohol and tobacco, followed by other drugs. Similar results were found in previous studies in the PHC setting in Thailand,[19] in South Africa,[25] and in USA.[24]

In agreement with former research,[20,23,25,36,37] this survey showed that male sex, younger age, lack of social support, and being single, separated, divorced, or widowed were associated with substance use disorders in the MH and/or PHC setting. Sex specific role expectations and norms, such as associating substance use with masculinity, may be related to the male preponderance of any substance use disorder.[38,39] Reduction in the prevalence of substance use disorders with age is expected, due to a decreased tolerance towards substances with ageing.[40,41] Perceived social support, including being married, has been shown to be protective against substance use disorder.[36]

A previous study in Thailand found an association between having primary or less education and substance use disorder,[20] while this study did not find such an association. This study also did not find an association between economic status (extent of debt) and substance use disorder, unlike in some previous research.[42] While a previous study[27] found that the prevalence of substance use disorders increased with multiple chronic conditions, this study did not find this association. Consistent with a previous investigation[26] this study found that having depression or anxiety was in univariate analysis marginally associated with a substance use disorder.

Considering the high prevalence of any substance use disorder in the MH setting, it appears that MHs are preferred over PHC centres, which provide "preventive, promotive and basic curative care",[43] in dealing with substance use disorders in Thailand. More studies are called for on the treatment modalities of substance use disorders by MHs. This may include naturalistic prospective investigations on the treatment outcome of substance use orders.[16] To reduce the gap in the treatment of substance use disorders, especially in rural communities in Thailand, MHs should be trained in evidence-based treatment practices.[17]

*Study limitations*

Substance use disorders were only assessed with the use of a brief screening measure. Future studies should include structured psychiatric assessments. Furthermore, the selection of the sites was purposefully, which is an additional study limitation.

## Conclusion

The proportion of substance use disorders among MH attendees was more than twice that of PHC attenders in Thailand, calling for collaboration in controlling substance use disorders between the two treatment systems. Monk healers should be trained in evidence-based practices to reduce substance abuse. Prospective investigations are needed on the treatment approach of substance use disorders by monk healers.

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Table 1: Sociodemographic and substance use disorder characteristics of participants
(N=1204)

| Variable | MH | PHC | P-value[a] | MH | PHC | P-value[a] |
|---|---|---|---|---|---|---|
| | Sample | Sample | | Any substance use disorder | | |
| | M (SD) | M (SD) | | M (SD) | M (SD) | |
| Age (years) | 47.3 (13.8) | 53.3 (14.1) | <0.001 | 44.3 (12.7) | 47.4 (14.5) | 0.296 |
| | N (%) | N (%) | | N (%) | N (%) | |
| All | 591 (49.1) | 613 (50.9) | | 69 (11.7) | 33 (5.4) | |
| Sex | | | | | | |
| Female | 451 (76.3) | 443 (72.3) | 0.267 | 28 (40.6) | 10 (30.3) | 0.298 |
| Male | 140 (23.7) | 170 (27.7) | | 41 (59.4) | 23 (69.7) | |
| Formal education | | | | | | |
| Primary or less | 225 (38.5) | 394 (64.5) | <0.001 | 29 (43.3) | 16 (48.5) | 0.256 |
| Secondary | 185 (31.7) | 163 (26.7) | | 24 (35.8) | 13 (39.4) | |
| Post-secondary | 174 (29.8) | 54 (8.8) | | 14 (20.9) | 4 (12.1) | |
| Marital status | | | | | | |
| Single/divorced/separated/widowed | 246 (41.7) | 139 (22.7) | <0.001 | 40 (58.8) | 6 (18.2) | <0.001 |
| Married | 344 (58.3) | 473 (77.3) | | 28 (41.2) | 27 (81.8) | |
| Employment status | | | | | | |
| No | 190 (32.4) | 153 (25.1) | 0.132 | 20 (29.4) | 6 (18.2) | 0.244 |
| Yes | 397 (67.6) | 456 (74.9) | | 48 (70.6) | 27 (81.8) | |
| In debt | | | | | | |
| No/Little | 426 (72.1) | 454 (74.1) | 0.522 | 49 (71.0) | 26 (78.8) | 0.405 |
| High | 165 (27.9) | 159 (25.9) | | 20 (29.0) | 7 (21.2) | |
| Social support | | | | | | |
| Poor | 104 (17.8) | 102 (16.9) | <0.001 | 17 (24.6) | 3 (9.4) | 0.098 |
| Moderate | 272 (46.6) | 375 (62.0) | | 37 (53.6) | 24 (75.0) | |
| Strong | 208 (35.6) | 128 (21.1) | | 15 (21.7) | 5 (15.6) | |
| Chronic conditions | | | | | | |
| None | 211 (35.9) | 232 (38.2) | 0.711 | 29 (42.6) | 12 (36.4) | 0.832 |
| 1-2 | 228 (38.8) | 228 (37.5) | | 22 (32.4) | 12 (36.4) | |
| 3 or more | 148 (25.2) | 148 (24.3) | | 17 (25.0) | 9 (27.3) | |
| Major depression and/or generalized anxiety disorder | | | | | | |
| No | 462 (88.6) | 505 (83.5) | | 47 (69.1) | 23 (71.9) | |
| Yes | 126 (21.4) | 100 (16.5) | 0.027 | 21 (30.9) | 9 (28.1) | 0.779 |

MH=Monk healer setting; PHC=Primary Health Care setting; M=Mean; SD=Standard deviation; [a]Based on Chi-square or Fisher's exact test

Table 2: Proportion of each substance use disorder of participants (N=1204)

| Variable | MH | | PHC | | P-value[a] |
|---|---|---|---|---|---|
| | N | % (95% CI) | N | % (95% CI) | |
| **Any substance use disorder** | 69 | 11.7 (9.3-14.5) | 33 | 5.4 (3.9-7.5) | <0.001 |
| Tobacco use disorder | 48 | 7.6 (5.7-9.9) | 16 | 2.5 (1.5-4.0) | <0.001 |
| Alcohol use disorder | 64 | 10.0 (8.4-13.6) | 28 | 4.3 (3.0-6.3) | <0.001 |
| **Any drug use disorder** | 25 | 4.2 (2.8-6.1) | 2 | 0.3 (0.08-1.3) | <0.001 |
| Cannabis use disorder | 8 | 1.3 (0.7-2.6) | 1 | 0.2 (0.02-1.1) | 0.015 |
| Amphetamine use disorder | 22 | 3.6 (2.4-5.3) | 0 | 0.0 | <0.001 |
| Sedative use disorder | 14 | 2.2 (1.3-3.7) | 4 | 0.6 (0.2-1.6) | 0.014 |
| Opioid use disorder | 1 | 0.2 (0.02-0.1) | 0 | 0.0 | 0.490 |
| Past three months any drug use | 49 | 8.2 (6.2-10.7) | 9 | 1.5 (0.8-2.8) | <0.001 |

MH=Monk healer setting; PHC=Primary Health Care setting; [a]Based on Chi-square or Fisher's exact test

Table 3: Univariate associations with any substance use disorder by treatment setting

| Variable | MH | | PHC | |
|---|---|---|---|---|
| | COR (95% CI) | p-value | COR (95% CI) | p-value |
| Age in years | 0.98 (0.96, 0.99) | 0.040 | 0.97 (0.94, 0.99) | 0.019 |
| Sex | | | | |
|   Female | 1 (Reference) | | 1 (Reference) | |
|   Male | 8.00 (4.51, 14.18) | <0.001 | 6.25 (2.79, 13.99) | <0.001 |
| Formal education | | | | |
|   Primary or less | 1 (Reference) | | 1 (Reference) | |
|   Secondary | 1.15 (0.62, 2.15) | 0.663 | 2.04 (0.93, 4.47) | 0.077 |
|   Post-secondary | 0.66 (0.33, 1.34) | 0.247 | 1.33 (0.37, 4.75) | 0.666 |
| Marital status | | | | |
|   Single/divorced/separated/widowed | 1 (Reference) | | 1 (Reference) | |
|   Married | 0.45 (0.26, 0.78) | 0.004 | 1.26 (0.50, 3.15) | 0.627 |
| Employment status | | | | |
|   No | 1 (Reference) | | 1 (Reference) | |
|   Yes | 1.13 (0.63, 2.04) | 0.674 | 1.73 (0.65, 4.62) | 0.273 |
| In debt | | | | |
|   No/Little | 1 (Reference) | | 1 (Reference) | |
|   High | 1.24 (0.71, 2.17) | 0.443 | 0.82 (0.35, 1.92) | 0.640 |
| Social support | | | | |
|   Poor | 1 (Reference) | | 1 (Reference) | |
|   Moderate | 0.72 (0.39, 1.35) | 0.310 | 2.42 (0.71, 8.19) | 0.156 |
|   Strong | 0.36 (0.17, 0.76) | 0.008 | 1.64 (0.38, 7.02) | 0.589 |
| Chronic conditions | | | | |
|   None | 1 (Reference) | | 1 (Reference) | |
|   1-2 | 0.78 (0.43, 1.41) | 0.416 | 1.43 (0.63, 3.25) | 0.393 |
|   3 or more | 0.87 (0.46, 1.85) | 0.676 | 1.95 (0.80, 4.77) | 0.143 |
| Major depression and/or generalized anxiety disorder | | | | |
|   No | 1 (Reference) | | 1 (Reference) | |
|   Yes | 1.71 (0.98, 2.99) | 0.058 | 2.10 (0.94, 4.68) | 0.070 |

MH=Monk healer setting; PHC=Primary Health Care setting; COR=Crude odds ratio; CI=Confidence Interval

Table 4: Multivariable associations with any substance use disorder by treatment setting

| Variable | MH | | PHC | |
|---|---|---|---|---|
| | AOR (95% CI)[1] | p-value | AOR (95% CI)[a] | p-value |
| Age in years | 1.00 (0.98, 1.02) | 0.698 | 0.95 (0.92, 0.98) | <0.001 |
| Sex | | | | |
|   Female | 1 (Reference) | | 1 (Reference) | |
|   Male | 9.52 (5.06, 17.92) | <0.001 | 7.05 (2.99, 16.63) | <0.001 |
| Marital status | | | | |
|   Single/divorced/separated/widowed | 1 (Reference) | | --- | |
|   Married | 0.32 (0.16, 0.61) | <0.001 | | |
| Social support | | | | |
|   Poor | 1 (Reference) | | --- | |
|   Moderate | 1.00 (0.47, 2.12) | 0.999 | | |
|   Strong | 0.40 (0.16, 0.99) | 0.048 | | |

MH=Monk healer setting; PHC=Primary Health Care setting; AOR=Adjusted odds ratio; CI=Confidence Interval; [a]Adjusted for all variables in the Table