

Suicidal attempts and self-poisoning: 1-year retrospective cohort study from the quaternary hospital in Thai metropolitan area

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Abstract

Background and Aims: In Thailand, suicide is the leading cause of death among middle-aged adults. We believe suicide characteristics depend on different cultural/socioeconomic status. This study aimed to describe the characteristics and associated factors of suicidal attempts by self-poisoning in Bangkok, the metropolitan city of Thailand.

Methods: Records of all patients visiting the emergency department of King Chulalongkorn Memorial Hospital, Bangkok, Thailand, with self-poisoning suicidal attempts throughout 2021 were collected and analyzed.

Results: Self-poisoning accounted for 110 attempts (by 74 patients). Females aged 11–30 were the most prevalent group. Pharmaceutical agents were commonly used. Most patients (86.4%) had underlying psychiatric illness(es), mostly major depressive disorder. Female, history of psychiatric illness and follow-ups, personality comorbid, and previous attempts reached statistical significance by univariate regression for factors associated with reattempting suicide, but only personality comorbid was significant from multivariable study ($p = 0.02$). Reattempting mostly recurred within 8 days after the prior attempt.

Conclusion: Majority of self-poisoned patients in Bangkok were young adults taking medications, which differs from the overall Thai population where most instances involve patients of older patients (30–50 years) and ingestion of agricultural substances. Appropriate strategies are needed for specific psychosocial/socioeconomic contexts and within the critical period after previous nonfatal attempts.

KEYWORDS

intentional overdose, overdose, poisoning, self-poisoning, suicidal attempt, suicide

1 | INTRODUCTION

Suicide is a global mental health concern that causes significant burdens, especially in low- to middle-income countries.¹ Suicide in Southeast Asia accounts for one-third of suicides globally with distinct characteristics of attempts compared to other regions in the world.² Although Thailand's suicidal rate ranked 86th globally,³ suicide is the 4th leading cause of death among middle-aged adults (7.37 suicide-related death per 100,000 population).⁴ Several preventive strategies have been implemented; yet, only a few are proven effective in preventing these suicide attempts.⁵

Methods of suicide differ among age groups and prognosticate the risk of death. Highly detrimental methods (i.e., hanging, firearms, or explosives) tend to be used among the older population,⁶ while intentional drug overdose or self-poisoning is more common in adolescents. Holding a lower risk for death, the latter groups often show up at the emergency department (ED).⁷ Therefore, nonfatal suicidal attempts by self-poisoning are challenges for ED physicians and psychiatrists to evaluate the severity of poisoning as well as the underlying mental conditions. Because self-poisoning is the leading cause of poison exposure in Thailand,⁸ identifying the unique characteristics of patients is necessary to develop a tailor-made multidimensional approach and suicidal prevention program in specific areas.^{9,10}

Because cultural contexts and socioeconomic status affect the prevalence of mental disorders among the Thai population,¹¹ we believe suicide characters in the urbanized region are different from their rural counterparts. Serious mental disorders are typically more common in urban environments.¹² Unfortunately, relevant studies in these particular areas are limited. Despite the unclear links between urbanization and mental health, greater research is necessary to understand its effects, particularly in developing countries where urbanization is rapidly growing.¹³ Therefore, this study aimed to describe the characteristics of patients visiting the ED with suicidal attempts by self-poisoning in Bangkok, the metropolitan city of Thailand. Additionally, associated factors of reattempting were analyzed to further strengthen suicide prevention policy.

2 | METHODS

2.1 | Study design and population

This is a retrospective cohort, single-center study at King Chulalongkorn Memorial Hospital (KCMH), Bangkok, Thailand. Records of all patients visiting the ED with self-poisoning suicidal attempts from January to December 2021 were included. All psychiatric and toxicologic consultations must be documented by attending physicians. Patients whose records were missing or incomplete were excluded.

Collected data included patients' age, gender, previous illnesses and comorbidities, history of self-harm or suicide, timing and character of self-poisoning events, and clinical outcomes. Incomplete information was reported as missing. A repeated suicidal attempt was counted as a separate occasion in our study.

Outcomes were determined by a toxicologist at our institution using a standard poison severity score (PSS).¹⁴ PSS score 0–4 were defined as no symptom, mild, moderate, severe, and death. We subclassified self-poisoning by pharmacologic class of substances according to World Health Organization.¹⁵ Each visit was categorized into ED visit, hospitalization, or intensive care unit admission. Detection of ethanol and illicit drugs was not routinely performed unless guided by the patient history.

The pre-existing data were retrospectively analyzed for this study. Therefore, the patient's written consent was not obtained but the results reported in our study was not identifiable to ensure the confidentiality of our patients. All patients visiting the ED with self-poisoning were recruited so neither sample size calculation nor sampling was done. This study received approval from the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand (COA no. 256/2022).

2.2 | Definition

A suicidal attempt is defined as any self-inflicted, potentially harmful behavior with a nonfatal outcome but has evidence of intention to die.¹⁶ Only suicidal attempts using drugs, chemicals, or other substances are defined as "suicidal attempt by intentional drug overdose or self-poisoning." This also includes poisoning with noningestible substances, an overdose of "recreational" drugs, and severe alcohol intoxication where clinical staff thought that the self-harm was intentional.⁷

A repeated self-poisoning attempt is defined as an attempt following prior nonfatal attempts before or during the study period.

2.3 | Statistical analysis

SPSS version 22.0 was used for data analysis. Demographic data, psychiatric history, and toxicological assessment were reported as counts and percentages, mean and standard deviation (SD), or median and interquartile range (IQR) as appropriate. To determine the difference, we used Pearson's χ^2 or Fisher's exact test for categorical data and student t-test and Mann-Whitney *U* test for continuous data, according to data distribution. Univariate logistic regression was done and only variables that showed a trend of statistically significant association or those congruent with theoretical concepts would be included in the multivariable analysis. A *p* value of <0.05 was considered statistically significant and all tests were 2-sided.

3 | RESULTS

During the time of study, there were total 21,957 ED visits. Among those visits, psychiatric consultation was responsible for 832 (12.9%) occasions. The number of suicidal-related events was 316 (37.9%) of

all psychiatric consultations. Averagely, self-poisoning accounted for 110 attempts (by 74 patients) or 13.2% and 34.8% of the total and suicidal-related psychiatric consultations, respectively. The highest number of consultations was during March (107 consultations), followed by April (78 consultations), and September (76 consultations) of 2021. The number of consultations per month is illustrated in Figure 1.

Of 110 attempts, 89 were female (80.9%) with a median age of 22 (range 15–66). Most patients (86.4%) had underlying psychiatric illness(es), of which major depressive disorder was the most prevalent primary diagnosis; meanwhile, unspecified cluster B personality and posttraumatic stress disorder were the most common psychiatric comorbidities. Before the ED visit, pre-existing psychiatric diagnoses were documented in 61 patients. Additionally, 11 patients had personality comorbidity. We found low prevalence of underlying medical diseases, of which neurological disorders were the highest (5.5%). One patient was pregnant at 8 weeks of gestational age. Seventeen patients committed 36 episodes of reattempting suicide during the study period. Demographic data of all patients are shown in Table 1.

3.1 | Characteristics of ED presentation

Table 2 shows the characteristics of ED presentation. The median time to hospital visit was early, usually in the afternoon shift. There was an equal ratio of single and polysubstance overdose. Only 13 attempts (11.8%) were accompanied by another method of self-harm. For patients currently undergoing psychiatric treatments, the median time from the last psychiatric appointment was 8 days. The earliest time of repeated suicide was within the same day from the last follow-up (four attempts). Sixty-eight events (61.8%) were preceded by prior suicidal attempts of any means. There was no death in our

study. According to the PSS score, approximately 90% of attempts were graded asymptomatic to mild severity upon presentation and final outcomes. Only five attempts (4.5%) resulted in clinical progression (more severe). Most cases (86.4%) were observed at the ED until discharged.

3.2 | Severity

For the purpose of analysis, we characterized four cases with moderate-severe symptoms as an additional category “severe outcome” group, defined as a patients presenting with PSS of two or more¹⁷ (Table 3).

3.3 | Use of xenobiotics

Ingestion was the only route of exposure of all self-poisoning in our study (100.0%). The most common substances were pharmaceutical agents (96.4%) (Table 4). Psychotropic agents (benzodiazepines and antidepressants) and over-the-counter (OTC) drugs accounted for approximately 90% of all substances. Nonpharmaceutical agents included household detergents and one case of household pesticide (pyrethroid). Unspecified agents were vaguely informed by the patients. Acetaminophen was the leading substance for patients without any previous psychiatric diagnosis (10 of 16 attempts, 62.5%), while psychotropic agents were rather common for patients diagnosed with psychiatric disorder(s) (74 out of 95 attempts, 77.9%).

Teenagers and young adults (11–30 years) were self-poisoned by a wider range of substances. Overdose of antihypertensive agents, including propranolol and verapamil, were found only in this age group. These drugs were prescribed for anxiety/panic attacks and hypertension in the young, respectively.

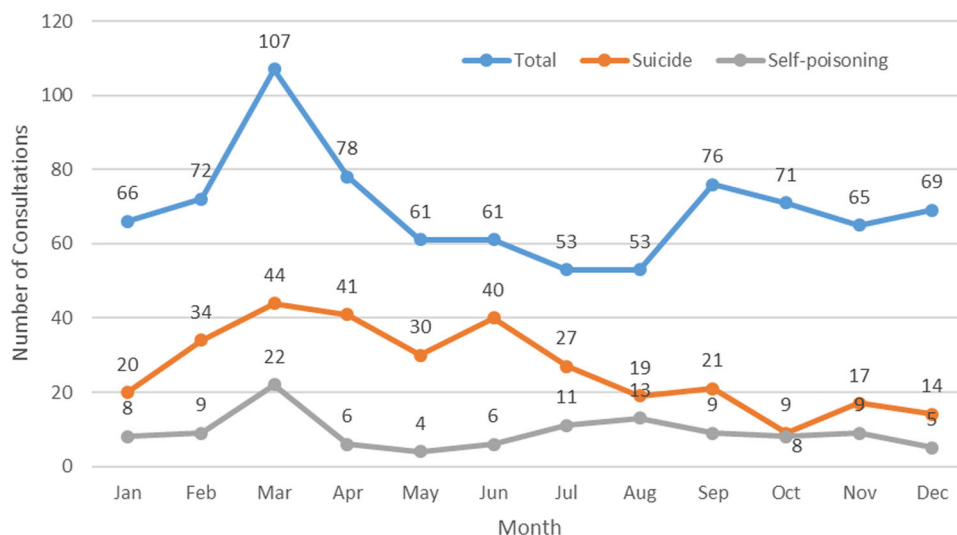


FIGURE 1 Distribution of total, suicide-related, and self-poisoning-related psychiatric consultation from the emergency department throughout 2021

TABLE 1 Demographic data of patients (*n* = 110)

Variables	N (%) or median [IQR]
Sex	
Male	21 (19.1)
Female	89 (80.9)
Age (years)	22 [18, 28]
Attending psychiatrist	
New case	15 (13.6)
Psychiatric resident	56 (50.9)
Psychiatric staff	17 (15.5)
Follow up at other hospitals	22 (20.0)
Primary psychiatric diagnosis before ED visits	
Major depressive disorder	62 (56.4)
Bipolar disorder	21 (19.1)
Persistent depressive disorder	4 (3.6)
Adjustment disorder	3 (2.7)
Psychotic disorder	2 (1.8)
Anxiety disorder	1 (0.9)
Autistic spectrum disorder	1 (0.9)
Personality and psychiatric comorbidities	
Unspecified cluster B personality disorder	14 (12.7)
Posttraumatic stress disorder	12 (10.9)
Borderline personality disorder	6 (5.5)
Bulimia nervosa	1 (0.9)
Underlying diseases	
Hypertension or diabetes mellitus or dyslipidemia	2 (1.8)
HIV infection	4 (3.6)
Neurological diseases (migraine, epilepsy, stroke, frontal fibrosis dysplasia)	6 (5.5)
Breast cancer	2 (1.8)
Pregnancy	1 (0.9)
Reported concurrent substances use	
Alcohol	10 (9.1)
Smoking	4 (3.6)
Cannabis and Kratom	4 (3.6)
Stimulants and hallucinogens (amphetamine, ecstasy, ketamine)	6 (5.5)

Abbreviations: ED, emergency department; IQR, interquartile range.

TABLE 2 Characteristics of ED presentation (*n* = 110)

Characteristics	N (%) or median [IQR]
Time to hospital after attempt	2 [1, 6.5]
Time of ED visit	
08.00–16.00	31 (28.2)
16.0–24.00	52 (47.3)
24.00–08.00	27 (24.5)
Type of exposure	
Single substance	55 (50.0)
Polysubstances	55 (50.0)
Type of overdose substances (<i>N</i> = 192)	
Pharmaceutical agent	185 (96.4)
Nonpharmaceutical agent	7 (3.6)
Other methods of concurrent self-harm	13
Cutting	11
Jumping from height	2
Hanging	1
Date from last psychiatric appointment (days) (<i>N</i> = 63 patients with psychiatric follow-up)	8 [2.5,23]
History of previous suicide (any method) (<i>N</i> = 68 attempts)	39 (57.4)
Overdose	18 (26.5)
Self-harm	12 (17.6)
Cutting/stabbing	1 (1.5)
Jumping	2 (2.9)
Hanging	2 (2.9)
Both overdose/self-harm	5 (7.4)
Others	1 (1.5)
Unknown	6 (8.8)
ED resuscitation	
NG lavage	14 (12.7)
Single-dose activated charcoal	23 (20.9)
Whole bowel irrigation	0 (0.0)
Intubation	2 (1.8)
Vasopressor	0 (0.0)
Cardiopulmonary resuscitation	0 (0.0)
Severity at presentation (PSS score)	
0	24 (21.8)
1	83 (75.5)
2	2 (1.8)
3	1 (0.9)

TABLE 2 (Continued)

Characteristics	N (%) or median [IQR]
4	0 (0.0)
Medical outcome (PSS score)	
0	25 (22.7)
1	81 (73.6)
2	3 (2.7)
3	1 (0.9)
4	0 (0.0)
Hospital stay	
ED	95 (86.4)
Hospitalization	13 (11.8)
Intensive care unit admissions	2 (1.8)
Length of stay (days)	1 [0, 1]

Abbreviations: ED, emergency department; IQR, interquartile range; NG, nasogastric; PSS, poison severity score.

3.4 | Repeated self-poisoning

Factors associated with reattempting suicide were analyzed from 68 attempts who had prior nonfatal suicide attempts (Table 5). Female gender, history of psychiatric illness, personality comorbid, previous suicidal attempts, and history of psychiatric follow-ups reached statistical significance by univariate regression, but only personality comorbid was found significant in the multivariable study (Table 6).

4 | DISCUSSION

4.1 | Characters of patients, attempts, and outcomes

Our study was the first national report on those who attempted suicide by self-poisoning in the metropolitan area of Bangkok. All patients' toxicological profiles were extracted and rated severity by a single toxicologist to minimize interrater bias. Females aged 11–30 were the most prevalent group, while the incidence in Thailand showed an older age range of around 30–50 years.¹⁸ Pharmaceutical agents were used contrary to agricultural substances used by the rest of the country.^{8,18} We believed that age distribution, urbanization, socioeconomic status, access to healthcare, and access to more toxic substances in the city might play significant roles in the differences.¹⁹ The distribution of age, gender, coexisting psychiatric illnesses, and personality disorders were consistent with several previous studies that reported mental illnesses as risk factors for suicide.^{20–22}

Although our study population was self-poisoned, 13 patients also employed other methods of self-harm, and most patients have

nonfatal previous suicidal attempts of various methods. As method switching (between poisoning and other self-harm methods) is common, lacks discernible patterns,²³ and can eventually lead to completed suicide,²⁴ all patients, regardless of methods used, should be psychiatrically assessed.

Several overdoses involved OTC and prescribed controlled substances such as benzodiazepines and psychotropic agents, similar to previous studies.^{25–27} Because self-harm is often impulsive, it was not surprising that the most common overdose was readily available medications.

Most patients exhibited only mild symptoms according to PSS severity grading and presented early to the hospital (usually within 2 h). Only 4.5% progressed to more severe symptoms. There seemed to be no specific characteristics of the four patients with severe outcomes.

The rate of overdose was highest in March consistent with both total and any suicide-related consultation from the ED. Since our study site was a university hospital located next to the main campus, students took a great proportion ED patients. March was a period between examinations. This might explain the peak stress among university students and ED visits during this period.²⁸

4.2 | Reattempting suicide

Among 68 attempts of reattempting suicide, factors associated with repeated suicidal attempts were female gender, history of psychiatric disorders, personality comorbidity, previous attempts, and history of psychiatric follow-ups. These factors correlated with well-established risk factors of suicide in the youth population.^{29,30} More than half of all patients (61.8%) had prior history of nonfatal suicide and had psychiatric follow-up, ironically associated with reattempting suicide.³¹

Personality comorbidity was found to be the only significant factor after multiple regression analysis. The absence of association of other factors could be due to a limited number of patients included in the study and the missing data. Previous studies also found higher rate of reattempting suicide in patients with cluster B personality,³² and posttraumatic stress disorder.³³ One survival analysis shared the consistent findings that cluster B personality is a strong predictor of reattempting.⁹ Interestingly, the same study found significant association between reattempting and complying to treatment. Despite limited number of patients and treatment details beside our institution, follow-ups were nearly statistically significant. These populations warrant attention in the suicide prevention strategy.³³ Targeting the prevalent emotional dysregulation and international difficulties in cluster B populations by appropriate psychological interventions should be highlighted.³⁴

Notably, reattempting attempts occurred within weeks (8 days [2.5, 23]), agreeing to the Danish database the cumulative rates of reattempting suicide were particularly high within the first week of the index attempt.³⁵ Preventive efforts need to target the period close to discharge from the ED.⁵ Identifying an at-risk population and

TABLE 3 Characterization of severe cases

No.	Gender age (years)	Time from event to hospital (h)	Previous psychiatric diagnosis	Number of overdosed substance	Complications	LOS (days)
1	F 66	Unknown	-	2 (alprazolam, lorazepam)	RS failure Laryngeal injury	13
2	M 19	3	MDD	3 (Sertraline, chlorpheniramine, ibuprofen)	SS	4
3	M 27	1.5	MDD, drug abuse (ketamine, heroin, tramadol, codeine)	2 (amitriptyline, clonazepam)	Hyperthermia (SS, anticholinergic)	5
4	M 20	10	ASD, drug abuse (kratom)	1 (sertraline)	SS	1

Abbreviations: ASD, autistic spectrum disorder; LOS, length of stay; MDD, major depressive disorder; RS, respiratory system; SS, serotonin syndrome.

TABLE 4 Distribution of xenobiotics used for poisoning among different age groups

AGE	Pharmaceutical agents (n = 178)							Nonpharmaceutical agents	Unspecified agents
	Psychotropic agents (n = 127)				OTC (n = 44)		CVS		
	BZD	Antidepressants	Antipsychotics	Anticonvulsives	Analgesics	Others	Antihypertensive		
11–20 (n = 43)	19 (35.8)	18 (54.5)	14 (50)	4 (30.8)	11 (35.5)	6 (46.2)		2 (28.6)	2 (28.6)
21–30 (n = 46)	20 (37.7)	13 (39.4)	10 (35.7)	5 (38.5)	13 (41.9)	5 (38.5)	7 (100.0)	1 (14.3)	5 (71.4)
31–40 (n = 13)	8 (15.1)	1 (3.0)	3 (10.7)	4 (30.8)	1 (3.2)			3 (42.9)	
41–50 (n = 6)	3 (5.7)	1 (3.0)	1 (3.6)		6 (19.4)	2 (15.4)		1 (14.3)	
51–60 (n = 1)	1 (1.9)								
60++ (n = 1)	2 (3.8)								
Total	53	33	28	13	31	13	7	7	7

Note: Colors signifies the frequency of distribution of xenobiotics among age group: yellow (0%–25%), orange (26%–50%), red (51%–75%), and dark red (76%–100%).

Abbreviations: BZD, benzodiazepines; CVS, cardiovascular drugs; OTC, over-the-counter.

providing specific intervention, in our case adolescent-young adults, are worth investing in because self-poisoning in this group is a strong predictor of subsequent suicide and premature death.^{19,36,37} But because of the impulsive nature of patients with personality disorders, only suicide risk assessment may not prevent repeating attempts. Hospitalization is also less justified.³⁸ Therefore, individuals

with personality problems tend to repeat suicide attempts, as found in this study.

Certain information that increases the possibility of suicidal behavior, such as a history of childhood sexual abuse,³⁹ socio-economic status or unemployment,⁴⁰ family history of suicide, or psychiatric illnesses were not available in our study.^{39,41} Ethanol

TABLE 5 Univariate regression for associated factors of reattempting suicide

Variables	Univariate regression	
	OR (95% CI)	p Value
Female	0.2 (0.1–0.7)	0.02*
Age	1.0 (0.9–1.1)	0.60
Previous psychiatric diagnosis	12.0 (1.5–95.1)	0.02*
MDD diagnosis	0.7 (0.3–1.4)	0.29
Personality comorbidity	0.2 (0.1–0.5)	<0.001*
Underlying medical condition	1.0 (0.8–1.2)	0.88
Case of psychiatric resident	0.5 (0.2–1.2)	0.12
Previous suicidal attempt	2.7 (1.2–6.0)	0.02*
Other self-harm	1.1 (0.3–3.7)	0.93
Established toxicity	2.6 (1.0–6.8)	0.05
Presence supporting	0.9 (0.4–2.2)	0.89
Length of stay	1.0 (0.9–1.1)	0.67
Coming for follow up	2.7 (1.2–6.2)	0.02*
Suicidal idea before discharge	5.4 (0.6–49.7)	0.14

Abbreviations: CI, confidence interval; MDD, major depressive disorder; OR, odd ratio.

* $p < 0.05$.

TABLE 6 Multivariable regression for associated factors of reattempting suicide

Variables	Multivariable regression	
	aOR (95% CI)	p Value
Female	0.5 (0.1–1.9)	0.29
Previous psychiatric diagnosis	5.8 (0.7–50.9)	0.11
Personality comorbidity	0.2 (0.1–0.8)	0.02*
Previous suicidal attempt	1.2 (0.5–3.0)	0.66
Coming for follow up	2.2 (1.0–5.1)	0.06

Abbreviations: aOR, adjusted odd ratio; CI, confidence interval.

* $p < 0.05$.

levels nor urine screening of illicit drugs were not mandatory in every case. This single-center study may be subject to selection bias in which patients with prior follow-ups or more severe cases are prone to visit our institution, and self-poisoning episodes that do not lead to hospital attendance or serious attempts resulting in death were not included in this study. Also, because the study period was during the COVID-19 pandemic, the result might not represent normal situations. We believe a longitudinal follow-up along with the national or multicenter, comprehensive data record system would help to strengthen the study of associated risk factors for reattempting suicide and more effective prevention.

Our results emphasize the vulnerability of the younger age group, patients with psychiatric comorbidity and/or personality

disorder among this population harnessing unique metropolitan characters. Preventive policies and psychological interventions should be tailored considering these characteristics.

5 | CONCLUSION

The majority of self-poisoned patients in the metropolitan area of Bangkok were young adults. Most patients ingested OTC and prescribed medications resulting in mild to moderate symptoms with complete recovery. Reattempting suicides are strongly associated with personality comorbidity and mostly recur within a week. Appropriate suicidal prevention strategies are needed for specific psychosocial/socioeconomic contexts and within the critical period after the previous nonfatal attempt.

AUTHOR CONTRIBUTIONS

Suthimon Thumtecho: Conceptualization; data curation; methodology; project administration; supervision; writing – original draft; writing – review and editing. **Pannavach Sriworasuwat:** Data curation; investigation; resources; visualization; writing – original draft; writing – review and editing. **Sorawit Wainipitapong:** Conceptualization; data curation; formal analysis; supervision; writing – original draft; writing – review and editing.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

All authors have read and approved the final version of the manuscript. The corresponding author had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

ETHICS STATEMENT

The pre-existing data were retrospectively analyzed for this study. Therefore, the patient's written consent was not obtained but the results reported in our study was not identifiable to ensure the confidentiality of our patients. This study received approval from the Institutional Review Board of Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand (COA no. 256/2022).

TRANSPARENCY STATEMENT

The lead author Sorawit Wainipitapong affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted;

and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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