Iran J Psychiatry Behav Sci. 2017 September; 11(3):e7691. doi: 10.5812/ijpbs.7691.

Published online 2017 July 30. **Original Article**

Loneliness and Health Risk Behaviors Among ASEAN Adolescents

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Received 2016 June 28; **Revised** 2016 October 28; **Accepted** 2017 June 22.

Abstract

Background: Loneliness is commonly experienced during adolescence and has been associated with negative health outcomes.
Objectives: The present study aimed at assessing the factors associated with loneliness and investigating the relationship between loneliness and health risk behaviors among adolescents in the association of southeast asian nations (ASEAN).
Methods: This cross-sectional study included 30 284 schoolgoing adolescents (aged 13 - 15 years, mean age = 14.1 years, SD = 0.8) from 7 ASEAN countries, who took part in the global school-based student health survey (GSHS) between 2007 and 2013. The measure inquired about loneliness, health risk behaviours, and protective factors.
Results: Across the 7 ASEAN countries, 7.8% of the adolescents reported mostly or always being lonely and 31.3% reported sometimes being lonely in the past 12 months. In multivariable logistic regression, female gender, older age, living in a low or lower income country, not having close friends, bullying victimization, and lack of parental or guardian support were associated with mostly or always feeling lonely in the past 12 months. After adjusting for sociodemographic and social supportive factors, it was found that loneliness was associated with poor mental health, substance use, aggression, and other health risk behaviours.
Conclusions: A significant proportion of adolescents were experiencing loneliness, which was found to be associated with various health risk behaviours. Thus, it is important to recognize lonely adolescents early in to prevent more serious poor mental health and other health risk behaviours.

Keywords: Adolescents, ASEAN, Asia, Health Behaviour, Loneliness

1. Background

Loneliness is frequently experienced during adolescence and can be persistent and emotionally painful (1). For example, among adolescents in Northern Ireland, 16.3% reported often loneliness (1), in Russia 14.4% of the females and 8.9% of the males, and in USA 14.7% of the females and 6.7% of the males felt lonely (certainly true, as opposed to not true, or somewhat true) (2). A similar prevalence of loneliness (mostly or always) was reported among adolescents in middle income Asian countries, eg, the Philippines (11.2% among males and 11.4% among females) and China (6.6% among males and 8.1% among females) (3). There is a lack of studies investigating loneliness among adolescents in the association of southeast asian nations (ASEAN).

Loneliness is defined as a distressing feeling that accompanies the perception that one's social needs are not being met by the quantity or especially the quality of one's social relationships (4). During adolescence, the individual undergoes major social and personal transformations through redefining their social network, making them more susceptible to develop mental health problems. As suggested by some studies, the risk of psychiatric problems develops when an adolescent has repeatedly experienced loneliness (5). Some longitudinal research found that loneliness is associated with increased morbidity and mortality (4). Some correlates of loneliness among adolescents include sociodemographic, peer, and family factors. Sociodemographic factors include older adolescents (1, 6), gender, and poverty (1). Peer factors include peer victimization (7, 8), having fewer close friends (8), and experiencing poor-quality friendships (8). Family factors include various forms of lack of parental support such as inconsistent parenting and lack of parental warmth (7), and lack of intimacy, and conflict with parents (9).

Being lonely has been found to be associated with a number of health risk behaviours, including poor mental health, substance use, violence, injury, and sexual activity. Hence, the current study will examine loneliness and its association with various adolescents' health risk behaviours. Being lonely has been found to be associated with anxiety, depressive symptoms, low self-esteem, perceived stress (7, 10), suicidal ideation (11), and psychiatric morbidity (10). Moreover, loneliness was found to be associated with alcohol use, binge drinking, smoking, and illicit drug use (2, 3). Furthermore, loneliness increased the odds for bullying victimization experiences (12), aggression (13), injuries (14), truancy (15), and sexual risk behaviour (2).

The prevalence of loneliness, its correlates, and the association between loneliness and health risk behaviour among adolescents have not been studied sufficiently (2), particularly in low and middle income countries.

2. Objectives

The present study aimed at assessing factors associated with loneliness in ASEAN adolescents (Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam) and determining the relationship between loneliness and health risk behaviours in ASEAN adolescents from 2007 - 2013.

3. Materials and Methods

3.1. Sample and Procedure

This was a secondary analysis of cross-sectional school survey data from the global school-based health survey (GSHS) of 7 ASEAN countries (Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Vietnam). Data were collected during 2007 and 2013. All the ASEAN countries from which GSHS datasets were available were included in the study. The details and the dataset of the GSHS can be accessed online (16). A two-stage cluster sample design was used to collect data to represent all students in Grades 6, 7, 8, 9, and 10 in each country (16). At the first stage of sampling, schools were selected with probability proportional to their reported enrolment size (16). In the second stage, classes in the selected schools were randomly selected and all students in selected classes were eligible to participate irrespective of their actual ages (16).

Students completed the questionnaires under the supervision of external researchers (16).

3.2. Ethical Considerations

Consistent with the GSHS study protocol, the GSHS was approved by appropriate national government agencies in each participating country, and informed consent was obtained from the students, parents and/or school officials (16).

3.3. Measures

The study variables used were from the GSHS (16), which are described in Table 1. Sedentary behaviour was defined as spending 3 or more hours per day sitting when not in school or doing homework (17). The 3 items assessing parental or guardian support were added up to create a parental or guardian support index. Cronbach's alpha for this support index in this study was 0.70.

3.4. Data Analysis

STATA software Version 13.0 (Stata Corporation, College Station, Texas, USA) was used for data analysis. The study sample in each country was restricted to 13 to 15 year old group to make study samples comparable across countries. Logistic regression was used to examine the impact of explanatory variables on the risk of mostly or always experiencing loneliness in the past 12 months (= binary dependent variable). In the assessment of the association between loneliness and the health risk behaviour outcomes, the multivariable logistic regression analysis was adjusted for age, gender, subjective socioeconomic status (experience of hunger), country income level, peer support, and parental or guardian support. Both the p-value and the reported 95% confidence intervals were adjusted for the multi-stage sample design of the survey.

4. Results

4.1. Sample Characteristics

The total sample size was 30 284 schoolgoing adolescents (13 - 15 years) from 7 ASEAN countries. The number of participants in the individual countries ranged from 1734 in Cambodia to 16 095 in Malaysia; 14 750 (48.5%) were male and 15 430 (51.5%) were female, with a mean age of 14.1 years (SD = 0.8). The overall response rate differed from 82% in the Philippines to 96% in Vietnam. Across the 7 ASEAN countries, 7.8% of the adolescents reported mostly or always being lonely and 31.3% reported sometimes being lonely in the past 12 months. There were country differences, ranging from 3.3% of the adolescents in Myanmar to 14.2% in the Philippines reporting mostly or always feeling lonely. Furthermore, overall, female adolescents reported to be more often lonely than male adolescents. There were no country gender differences in relation to loneliness in Cambodia, Myanmar, Thailand, and Vietnam (Table 2).

4.2. Correlates of Adolescents' Loneliness

Female gender (odds ratio [OR] = 0.62, confidence interval [CI] = 0.52 - 0.74) was associated with a higher odds of loneliness. Among males, older age (15 years) (OR = 1.32, CI = 1.30 - 1.99) was associated with loneliness. The more frequent experience of hunger (or as a proxy for lower socioeconomic status) among both male and female adolescents (OR = 1.61, CI = 1.30-1.99) were correlated with loneliness. Female adolescents residing in a low or lower middle income countries were more likely to experience loneliness than those in upper middle income countries. Overall, lack of parental support (OR = 0.54, CI = 0.47 - 0.63) was associated with loneliness. Furthermore, having fewer friends (OR = 3.02, CI = 2.07 - 4.40) and bullying victimization (OR = 2.61, CI = 2.25 - 3.01) increased the risk of loneliness (Table 3).

Table 1. Description of the Variables

Variable	Question	Response Option
Lonely	"During the past 12 months, how often have you felt lonely?"	1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time to 5 = always (coded as 1 - 3 = 0 and 4 - 5 = 1)
Hunger (proxy of socioeconomic status)	"During the past 30 days, how often did you go hungry because there was not enough food in your home?"	1 = never to 5 = always (coded as 1 - 3 = 0 and 4 - 5 = 1)
	Poor mental health	
Suicidal ideation	"During the past 12 months, did you ever seriously consider attempting suicide?"	1 = yes, 2 = no (coded as 1 = 1 and 2 = 0)
Anxiety	"During the past 12 months, how often have you been so worried about something that you could not sleep at night?"	1 = never to 5 = always (coded 1 - 3 = 0 and 4 - 5 = 1)
No close friends	"How many close friends do you have?"	1 = 0 to 4 = 3 or more (coded 1 = 1 and 2 - 5 = 0)
	Substance use	
Current smoking cigarettes	"During the past 30 days, on how many days did you smoke cigarettes?"	1 = 0 days to 7 = all 30 days (coded as 1 = 0 and 2 - 7 = 1)
Current other tobacco use	"During the past 30 days, on how many days did you use any other form of tobacco, such as chewing tobacco leaves?"	1 = 0 days to 7 = all 30 days (coded as 1 = 0 and 2 - 7 = 1)
Current alcohol use	"During the past 30 days, on how many days did you have at least one drink containing alcohol?"	1 = 0 days to 7 = all 30 days (coded as 1 = 0 and 2 - 7 = 1)
Lifetime drunkenness	"During your life, how many times did you drink so much alcohol that you were really drunk?"	1 = 0 times to 4 = 10 or more times (coded as 1 = 0 and 2 - 4 = 1)
Illicit drug use	"How old were you when you first used drugs?"	1 = I never used drugs to 8 = 18 years old or older (coded 1 = 0 and 2 - 8 = 1)
	Aggression and other risk behavior	
Bullied	"During the past 30 days, on how many days were you bullied?"	1 = 0 days to 7 = All 30 days (coded as 1 = 0 and 2 - 7 = 1)
In physical fight	"During the past 12 months, how many times were you in a physical fight?"	1 = 0 times to 8 = 12 or more times (coded as 1 = 0 and 2 - 8 = 1)
Injury	"During the past 12 months, how many times were you seriously injured?"	1 = 0 times to 8 = 12 or more times (coded as 1 = 0 and 2 - 8 = 1)
Truancy	"During the past 30 days, on how many days did you miss classes or school without permission?"	1 = 0 times to 5 = 10 or more days (coded as 1 = 0 and 2 - 5 = 1)
Ever had sexual intercourse	"Have you ever had sexual intercourse?"	1 = Yes, 2 = No (coded as 1 = 1 and 2 = 0)
Sedentary behavior	"Leisure time sedentary behaviour was assessed by asking participants about the time they spend mostly sitting when not in school or doing homework: How much time do you spend during a typical or usual day sitting and watching television, playing computer games, talking with friends, or playing cards?"	1= less than 1 hour per day to 3 = 3 to 4 hours per day to 6 = 8 or more hours a day (coded as 1 - 2 = 0 and 3 - 6 = 1)
	Protective factors	
Peer support	"During the past 30 days, how often were most of the students in your school kind and helpful?"	1 = never to 5 = always
Parental or guardian supervision	"During the past 30 days, how often did your parents or guardians check to see if your homework was done?"	1 = never to 5 = always
Parental or guardian connectedness	"During the past 30 days, how often did your parents or guardians understand your problems and worries?"	1 = never to 5 = always
Parental or guardian bonding	"During the past 30 days, how often did your parents or guardians really know what you were doing with your free time?"	1 = never to 5 = always

4.3. Adolescents' Loneliness and Health Risk Behaviours

Overall, among male and female adolescents, loneliness was associated with poor mental health (suicidal ideation: OR = 3.37, CI = 2.83 - 4.00), anxiety: OR = 5.95, CI = 4.84 - 7.33) and having no close friend: OR = 3.11, CI = 2.28 - 4.23). Loneliness among adolescents was associated with the current tobacco use (OR = 1.42, CI = 1.17 - 1.73), current alcohol use (OR = 1.81, CI = 1.44 - 2.26), lifetime drunkenness (OR = 1.93, CI = 1.57 - 2.38), and illicit drug use (OR = 7.70, CI = 4.63 - 12.79). Furthermore, loneliness was associated with bullying victimization (OR = 2.58, CI = 2.22 - 2.99), having been in a physical fight (OR = 1.69, CI = 1.50 - 1.91), having sustained a serious injury (OR = 2.02, CI = 1.73 - 2.32), truancy (OR = 1.31, CI = 1.13 - 1.52), having had a sexual intercourse (OR

Table 2. Sample Characteristics

Study Country		Prevalence of Loneliness				Prevalence of Loneliness		
						Male	Female	Statistic
	Sample (13 - 15 years), No.	Never, %	Rarely, %	Sometimes, %	Mostly or always, %	Mostly or always, %	Mostly or always, %	P Value
Cambodia[a]	1734	31.5	19.2	45.0	4.3	3.9	4.6	0.071
Indonesia[b]	2867	25.5	26.8	38.1	9.6	7.4	11.6	< 0.001
Malaysia[c]	16095	33.3	33.0	26.7	7.0	5.7	8.6	< 0.001
Myanmar[b]	1983	61.8	10.2	24.7	3.3	3.7	3.0	0.754
Philippines[b]	3640	7.6	25.0	53.2	14.2	11.5	16.0	< 0.001
Thailand[c]	2223	34.3	27.8	30.0	7.9	7.9	8.0	0.868
Vietnam[b]	1742	31.9	35.7	23.8	8.6	8.0	9.2	0.141
All	30284	32.8	28.2	31.3	7.8	6.5	9.0	< 0.001

[a] Low income country.
[b] Lower middle income country.
[c] Upper middle income country (Source: world bank 2015) (18).

= 1.76, CI = 1.24 - 2.52), and sedentary leisure time behaviour (sitting 3 or more hours) (OR = 1.52, CI = 1.34 - 1.72) (Table 4).

5. Discussion

The current study explores the prevalence of loneliness, its associated factors, and the relationship between loneliness and various health risk behaviours among schoolgoing adolescents from 7 ASEAN countries. Overall, a significant prevalence of loneliness (31.3% sometimes, and 7.8% mostly or always) was found among adolescents, which is consistent with the findings of previous studies conducted in middle- and high- income countries (1-3). This finding is of concern calling for loneliness prevention and intervention programs (5) among schoolgoing adolescents in ASEAN.

The study found differences in the prevalence of loneliness among the countries, with higher rates in Indonesia and the Philippines and the lowest in Myanmar and Cambodia. In a previous study (19), the prevalence of loneliness among adolescents seemed to have been increasing from 2003, 2007, and 2011 in the Philippines. It is not clear what factors could explain these country differences in the light of the finding that the prevalence of loneliness was higher in low or lower middle income countries than in upper middle income countries. Moreover, poorer subjective socioeconomic status was found to be associated with loneliness, which was also found in a study in Northern Ireland (1). Previous research (20) also found that children from low-income families develop fewer social skills, which may explain greater loneliness in this adolescent group.

Overall, female adolescents reported to be lonely more often than male adolescents in this study; yet, there were no gender differences in Cambodia, Myanmar, Thailand, and Vietnam. These mixed findings have been confirmed in some previous studies (6, 9). In agreement with previous studies (7-9), this study found that peer victimization, having fewer close friends, and lack of parental or guardian support were associated with loneliness. Peer or bullying victimization may be related to loneliness because of its effects on poor friendship formation (7, 21). The finding that having a close friend was a protective factor against loneliness may be explained by the important role of close friends in providing social interaction and support (7). Good parenting styles may provide models for adolescents to learn improved interaction skills and reduce loneliness (7, 22). These findings could mean that loneliness prevention programs could improve parental support skills, develop friendship skills, and prevent bullying.

Furthermore, as found in several previous studies (2, 3, 5, 7, 10-15), this study indicated that loneliness was associated with various health risk behaviours including poor mental health (suicidal ideation, anxiety, and having no close friend), substance use (tobacco use, alcohol use, drunkenness, and illicit drug use), aggressive behavior (bullying victimization and being in a physical fight), and other risk behaviours (injury, truancy, having had a sexual intercourse, and sedentary leisure time behavior). Loneliness is an important longitudinal predictor of both adolescent depression and suicide ideation (23). The results on lonely adolescents that revealed their tendency to use substances (alcohol, tobacco use, illicit drugs), may

Table 3. Predictors of Loneliness

Variable	All	All	Male	Female
	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Gender				
Female	1 (Reference)	1 (Reference)	-	-
Male	0.73 (0.63 - 0.85)[a]	0.62 (0.52 - 0.74)[b]		
Age				
13	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
14	1.05 (0.88 - 1.25)	1.15 (0.96 - 1.40)	1.35 (1.00 - 1.81)[c]	1.03 (0.81 - 1.31)
15	1.26 (1.07 - 1.49)[b]	1.32 (1.11 - 1.57)[b]	1.48 (1.09 - 2.01)[c]	1.21 (0.97 - 1.51)
Hungry				
Never	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
Rarely	1.61 (1.28 - 2.03)[a]	1.42 (1.11 - 1.83)[b]	1.19 (0.85 - 1.68)	1.59 (1.17 - 2.17[b]
Some-times/mostly/always	1.93 (1.61 - 2.33)[a]	1.61 (1.30 - 1.99)[a]	1.48 (1.10 - 1.99)[b]	1.69 (1.28 - 2.24)[a]
Country income				
Low or lower middle income	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
Upper middle income	0.72 (0.60 - 0.86)[a]	0.81 (0.68 - 0.95)[c]	0.90 (0.69 - 1.16)	0.75 (0.60 - 0.93)[b]
Peer support				
No	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
Yes	0.71 (0.61 - 0.82)[a]	0.94 (0.80 - 1.10)	0.91 (0.69 - 1.19)	0.96 (0.77 - 1.19)
Number of close friends				
One or more	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
None	2.99 (2.23 - 4.01)[a]	3.02 (2.07 - 4.40)[a]	3.45 (2.10 - 5.67)[a]	2.50 (1.56 - 4.01)[a]
Bullying victimization				
No	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
Yes	2.90 (2.52 - 3.34)[a]	2.61 (2.25 - 3.01)[a]	2.57 (2.01 - 3.30)[a]	2.63 (2.22 - 3.11)[a]
Parental/guardian support				
0	1 (Reference)	1 (Reference)	1 (Reference)	1 (Reference)
1	0.64 (0.56 - 0.74)[a]	0.69 (0.60 - 0.80)[a]	0.76 (0.57 - 1.00)	0.66 (0.55 - 0.79)[a]
2 - 3	0.47 (0.41 - 0.54)[a]	0.54 (0.47 - 0.63)[a]	0.75 (0.58 - 0.98)[c]	0.48 (0.38 - 0.62)[a]

[a] $P < 0.001$.
[b] $P < 0.01$.
[c] $P < 0.05$.

be explained by the fact that they use substances as a way of coping with the pain of loneliness (2). The association between loneliness and sexual activity may be related to one way of coping with the negative effects of loneliness by relating physically with others (2). The finding of the association between loneliness and sedentary leisure time behaviour may be explained by an increased use of social media such that loneliness was related over time to using the Facebook for social skills compensation, reducing feelings of loneliness, and having interpersonal contact (24). The exact mechanisms explaining the relationship between loneliness and health risk behaviours are not clear. Hawkley and Cacioppo (25) propose predisease pathways, where lacking supportive social relationships and loneliness have been hypothesized to engage in greater health risk behaviors.

This study had several limitations. At first, the GSHS targets only adolescents who are in school, which is not

Table 4. Multivariate Logistic Regression Analyses of the Association Between Loneliness and Health Risk Behaviours Among Adolescents in ASEAN

Health Risk Behaviours (Outcome)	Loneliness	All	Male	Female
		Adjusted Odds Ratio (95% CI)[a]	Adjusted Odds Ratio (95% CI)[a]	Adjusted Odds Ratio (95% CI)[a]
Mental health				
Suicidal ideation	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	3.37 (2.83-4.00)***	3.58 (2.63-4.87)***	3.78 (2.62-4.17)***
Anxiety	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	5.95 (4.84-7.33)***	6.68 (4.98-8.96)***	5.46 (4.23-7.05)***
No close friend	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	3.11 (2.28-4.23)***	3.67 (2.30-5.86)***	2.45 (1.62-3.71)***
Substance use				
Tobacco use	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	1.42 (1.17-1.73)**	1.21 (0.93-1.58)	1.89 (1.31-2.73)***
Alcohol use	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	1.81 (1.44-2.26***	2.09 (1.58-2.78)***	1.53 (1.0-92.15)*
Drunkenness	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	1.93 (1.57-2.38)***	1.85 (1.37-2.50)***	2.00 (1.51-2.65)***
Illicit drug use	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	7.70 (4.63-12.79)***	10.15 (4.94-20.84)***	5.44 (3.10-9.54)***
Aggression and other risky behavior				
Bullying victimization	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	2.58 (2.22-2.99)***	2.57 (2.99-3.31)***	2.58 (2.17-3.08)***
In a physical fight	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	1.69 (1.50-1.91)***	1.75 (1.47-2.09)***	1.61 (1.33-1.96)***
Injury	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	2.02 (1.73-2.32)***	1.99 (1.52-2.59)***	2.03 (1.70-2.43)***
Truancy	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	1.31 (1.13-1.52)***	1.22 (0.96-1.56)	1.38 (1.15-1.65)***
Ever had sexual intercourse	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	1.76 (1.24-2.52)**	1.78 (0.96-3.29)	1.69 (0.96-2.98)
Sedentary leisure time behavior	No	1 (Reference)	1 (Reference)	(Reference)
	Yes	1.52 (1.34-1.72)***	1.51 (1.24-1.83)***	1.52 (1.29-1.80)***

[a] Adjusted for age, sex, subjective socioeconomic status (experience of hunger), country income, peer support, and parental or guardian support.

representative of all adolescents in a country. There might be differences in the prevalence of loneliness and specific health risk behaviors among nonschoolgoing and schoolgoing adolescents. The questionnaire was self-completed, which may have introduced biased responses. Moreover, some of the measures used in the study included single item formats like anxiety and loneliness, which may have limitations in their use as quantitative indices. Finally, as this study was cross- sectional, no causal conclusions could be drawn.

5.1. Conclusion

The study indicates that the prevalence of loneliness among schoolgoing adolescents in ASEAN countries is significant. Several predictors for loneliness were identified as well as associations between loneliness and various health risk behaviors including poor mental health, substance use, aggressive, and other health risk behav-

iors. This information may inform the design of loneliness prevention and intervention programs for adolescents in ASEAN countries.

Acknowledgments

We thank the world health organization and the centers for disease control and prevention for making the data for this analysis publicly available. We are also grateful to the country coordinators from Cambodia (Chher Tepirou), Indonesia (Rachmalina S. Prasodjo), Malaysia (Noor Ani Ahmad), Myanmar (Aung Tun), Philippines (Agnes Benegas-Segarra), Thailand (Pensri Kramomtong), and Vietnam (LE Thi Hoan) for collecting the GSHS data. The Ministries of Education and Health and the study participants in the GSHS in 7 ASEAN countries are acknowledged. The governments of the respective study countries and the world health organization did not influence the analysis nor did they have an influence on the decision to publish these findings. No funding resources were received for this study.

Footnotes

Authors' Contribution: Both authors (Karl Peltzer and Supa Pengpid) have participated in this work via analysis design and data interpretation, and writing of the manuscript. Both authors have contributed to writing, editing, reading, and approving the paper.

Declaration of Interest: The authors declare that they have no competing interests.

Funding/support: The study received no funding.

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