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REVIEW



## Prevalence of Suicidal Behavior Among Students in South-East Asia: A Systematic Review and Meta-Analysis

S. M. Yasir Arafat , Anuradha Baminiwatta , Vikas Menon ,  
Pawan Sharma , Mila Nu Nu Htay , Hasina Akter , M. Marthoenis , and  
Chencho Dorji 

### ABSTRACT

**Objectives:** Estimation of rates of suicidal behaviors (ideation, plan, and attempt) would help to understand the burden and prioritize prevention strategies. However, no attempt to assess suicidal behavior among students was identified in South-East Asia (SEA). We aimed to assess the prevalence of suicidal behavior (ideation, plan, and attempt) among students in SEA.

**Methods:** We followed PRISMA 2020 guidelines and registered the protocol in PROSPERO (CRD42022353438). We searched in Medline, Embase, and PsycINFO and performed meta-analyses to pool the lifetime, 1-year, and point prevalence rates for suicidal ideation, plans, and attempts. We considered the duration of a month for point prevalence.

**Results:** The search identified 40 separate populations from which 46 were included in the analyses, as some studies included samples from multiple countries. The pooled prevalence of suicidal ideation was 17.4% (confidence interval [95% CI], 12.4%–23.9%) for lifetime, 9.33% (95% CI, 7.2%–12%) for the past year, and 4.8% (95% CI, 3.6%–6.4%) for the present time. The pooled prevalence of suicide plans was 9% (95% CI, 6.2%–12.9%) for lifetime, 7.3% (95% CI, 5.1%–10.3%) for the past year, and 2.3% (95% CI, 0.8%–6.7%) for the present time. The pooled prevalence of suicide attempts was 5.2% (95% CI, 3.5%–7.8%) for lifetime and 4.5% (95% CI, 3.4%–5.8%) for the past year. Higher rates of suicide attempts in the lifetime were noted in Nepal (10%) and Bangladesh (9%), while lower rates were reported in India (4%) and Indonesia (5%).

**Conclusions:** Suicidal behaviors are a common phenomenon among students in the SEA region. These findings call for integrated, multi-sectoral efforts to prevent suicidal behaviors in this group.

### KEYWORDS

Prevalence; South-East Asia; students; suicidal behavior; suicide

## INTRODUCTION

Suicide is a major public health concern and occurs throughout the life-span. It was the fourth leading cause of death among 15- to 29-year-olds globally in 2019 (World Health Organization, 2021). It is a global phenomenon that has devastating effects on families, friends, and communities (Owusu-Ansah, Addae, Peasah, Asante, & Osafo, 2020). Although all population groups are at risk, concerns about the heightened risk of suicide among students have been raised since the 1950s (Gunnell, Caul, Appleby, John, & Hawton, 2020). A systematic literature search among 36 college student samples found

the pooled prevalence estimates of lifetime suicidal ideation, plans, and attempts to be 22.3%, 6.1%, and 3.2% respectively (Mortier et al., 2018). Hence, it is also an area of concern as students may represent a new high-risk group.

Countries from the World Health Organization (WHO) South-East Asia Region (SEAR) include 11 low- and middle-income countries with 26% of the global population but 39% of all global suicides in 2012 (Vijayakumar, Daly, Arafat, & Arensman, 2020). As per a scoping review, the reported suicide rates in the South Asian region varied widely from 0.43 to 331.0 per 100,000 populations (Jordans et al., 2014). This may be an underestimate due to differences in study populations, research methodology, and uncomprehensive data registration systems in this area (Vijayakumar et al., 2020). The actual magnitude of suicidal behavior in this part of the globe may be higher than presented in the available literature. There is a dearth of systematic reviews and meta-analyses that look into the prevalence rate of suicidal behavior among students of South-East Asia (SEA). Hence, there is an urgent need to obtain all available data on suicidal behavior that would help in accurately gauging the problem statement. Additionally, finding the prevalence of suicidal behavior in students is the first and a significant step in developing research priorities. Therefore, in the current study we aimed to assess the prevalence of suicidal behavior (ideation, plan, and attempt) among students in SEA.

## **METHODS**

### ***Search Strategy***

The protocol was registered in PROSPERO (PROSPERO 2022 CRD42022353438) before starting the review. We searched in Medline, Embase, and PsycINFO by predesigned search terms to identify research papers with the prevalence of suicidal behavior (idea, plan, and attempts) among students living in WHO-SEAR countries. The search details are available in [supplementary file 1](#). We included all the published research papers from inception to the search date (August 9, 2022).

### ***Inclusion Criteria***

Original articles, studies with quantitative estimates, articles published in the English language, and articles available as full text were included. The populations included in this review were restricted to studies among students in the WHO-SEAR of 11 low- and middle-income countries: Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, and Timor-Leste (<https://www.who.int/southeastasia/about>). Studies reporting a separate prevalence rate of different types of suicidal (idea/thought, plan, and attempt) behaviors were included. No age or gender restrictions were applied.

### ***Exclusion Criteria***

We excluded articles with qualitative outcomes and multiple articles from the same projects with the same estimates of the same behavior. Any type of review, editorial, erratum, and letters were excluded. We excluded the articles assessing suicidal behaviors

among students with special conditions such as having any mental illness and students attending psychiatric care. Articles mentioning the collective suicidal behavior and studies mentioning the estimates of nonsuicidal self-injury were excluded.

### Study Selection

We followed PRISMA 2020 guidelines while identifying the potential studies and mentioned the stepwise details of the search in [Figure 1](#). Two review authors (SMYA, HA) independently screened the articles, while comments from the third author (VM) were sought if necessary.

### Data Extraction

Two review authors (HA, PS) extracted data manually in Microsoft Excel version 10 considering the study objectives, and a third opinion (SMYA) was taken when

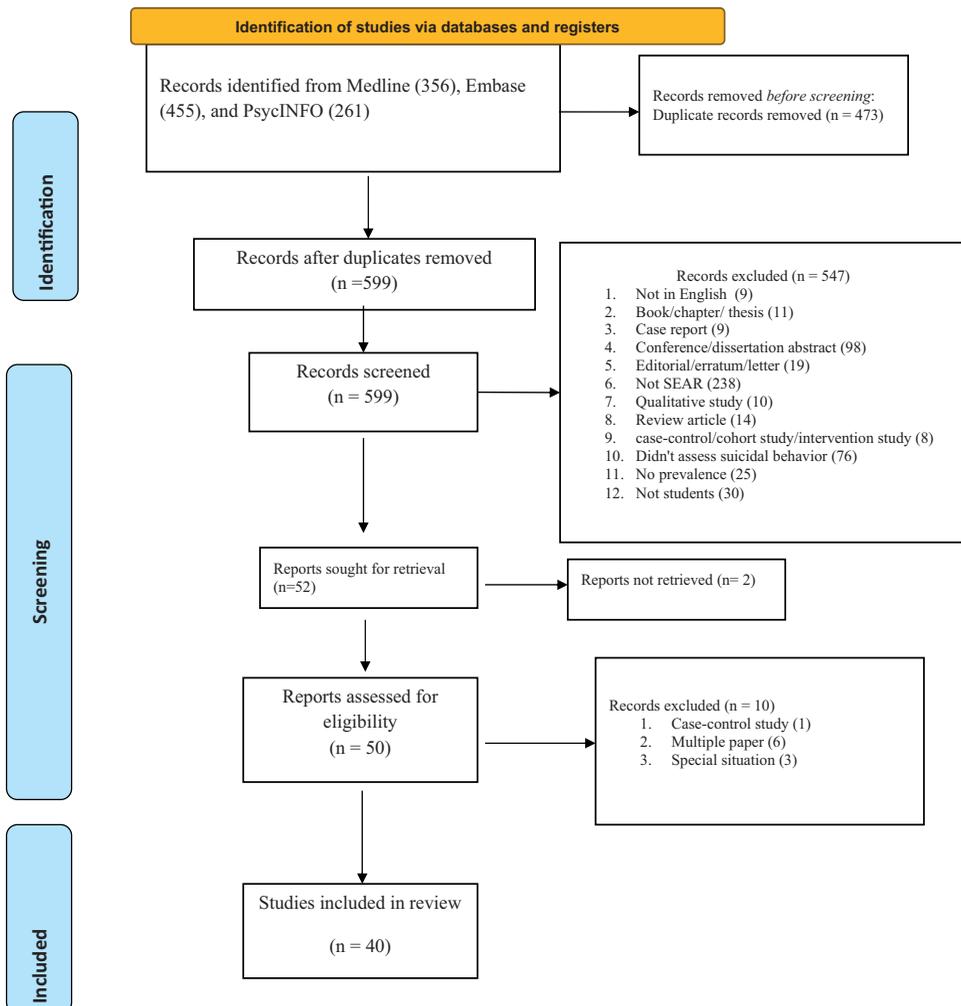


FIGURE 1. PRISMA 2020 flow diagram.

necessary. We extracted data from 11 SEAR countries from the studies conducted in multiple countries and considered them as a different set of data. We identified 40 articles from which 46 separate samples were extracted in the review for analysis. Among the 11 WHO-SEAR countries, articles were identified from 9 countries (Bangladesh, Bhutan, India, Indonesia, Myanmar, Nepal, Sri Lanka, Thailand, and Timor-Leste). We did not find any study assessing the prevalence of suicidal behavior among students of North Korea or the Maldives. We considered suicidal thoughts, plans, and attempts within the last month as point prevalence.

### **Quality Assessment**

The methodological quality of the included articles was assessed by using Newcastle Ottawa Quality Assessment Scale that was adapted for the cross-sectional studies (Modesti et al., 2016). Two authors (MH and MM) independently assessed the quality and risk of bias of included cross-sectional studies. The scale assessed three domains: (1) sample selection, (2) comparability of the different outcome groups, and (3) outcome assessments and statistical analysis. The scores were allocated for each section with a total of 10. The scores for each section were summed up and evaluated as high risk of bias ( $\leq 3$ ), moderate risk of bias (4–6), and low risk of bias ( $\geq 7$ ) (Wells et al., 2000).

### **Data Analysis**

The prevalence estimates in the selected studies for different suicidal behaviors (ideation, plan, and attempt) were meta-analyzed to create pooled prevalence estimates using the Meta and Metafor packages in RStudio. The random intercept logistic regression method was used to pool the data. Heterogeneity was examined using the  $I^2$  statistic. Due to the high heterogeneity, random-effects models were used for the syntheses. Pooled results were displayed using forest plots. Subgroup analyses were performed to see whether the prevalence estimates varied among the students studying across three settings—university, college, and school; religion; and countries. A sensitivity analysis was conducted by excluding low-quality studies. Moderator analyses were performed to test the moderating effect of gender composition (i.e., percentage of males) and the year of publication on effect sizes. Publication bias was analyzed by inspecting the funnel plots and the Egger's test for funnel plot asymmetry; a significant  $p$  value ( $< .05$ ) for Egger's test indicated the presence of publication bias. Moderation analyses and tests of funnel plot asymmetry were not performed in meta-analyses with fewer than 10 studies. Only those subgroups having at least two studies were included in the subgroup analysis.

### **Ethical Aspects**

We did not seek any institutional approval, as we assessed already available papers.

## RESULTS

### *Characteristics of Included Studies*

A total of 40 studies were included in this review. The process of selection of studies for this review is summarized in a PRISMA flowchart in [Figure 1](#). In cross-country studies, the population in each country was considered a separate population when conducting meta-analyses; thus, a total of 46 separate populations were included in the analyses. With regard to individual countries, the highest number of studies were from India ( $n = 12$ ) and Bangladesh ( $n = 12$ ), followed by Indonesia ( $n = 7$ ), Thailand ( $n = 7$ ), Nepal ( $n = 3$ ), and Myanmar ( $n = 2$ ); one study each was identified from Bhutan, Sri Lanka, and Timor-Leste. Study characteristics are mentioned in [Table 1](#). We identified that the first study was published in 2006, followed by two studies in 2009 and 2011 each, six studies in 2012, one study in 2014, four studies in 2017, five studies in 2019, eight studies in 2020, and three studies in 2021; the other eight studies were published in 2022 ([Table 1](#)).

A wide range of instruments had been used by the included studies for the assessment of suicidal behaviors. The most frequently utilized instrument was the Global School-based Student Health Survey (GSHS) questionnaire, which was used in 12 studies. The next most commonly used scales were the Patient Health Questionnaire (PHQ-9;  $n = 5$ ), Suicidal Behaviors Questionnaire-Revised (SBQ-R;  $n = 3$ ), and Beck Depression Inventory (BDI;  $n = 3$ ).

The majority of samples were composed of university students ( $n = 22$ ) and school students ( $n = 18$ ); two studies were conducted exclusively among college students, whereas three studies had mixed samples of school and college students. The size of individual study samples ranged from 206 to 50,003. The percentage of males in the samples ranged from 15.5% to 70.3% ([Table 1](#)).

### *Prevalence of Suicidal Ideation*

#### *Lifetime Prevalence*

The pooled lifetime prevalence of suicidal ideation among students overall, based on 17 studies, was 17.4% (95% confidence interval [CI], 12.36%–23.94%; [Figure 2](#)). A high degree of heterogeneity was noted ( $I^2 = 98.8\%$ ). The majority of studies ( $n = 10$ ) reporting a lifetime prevalence of suicidal ideation were among university students. Numerically, the highest prevalence was seen among college students (22.18%), with a lower prevalence observed in school students (12.5%), but subgroup analysis failed to show statistically significant subgroup differences ( $Q = 1.96$ ,  $p = .3751$ ). Out of the four countries from which these studies originated, the highest prevalence was from Bangladesh; however, these cross-country differences were not statistically significant ( $Q = 3$ ,  $p = .39$ ) ([Supplementary Figure 1](#)). A subgroup analysis based on the predominant religion of the country indicated that the prevalence was higher in Islamic countries (23%) compared to Hindu countries (15%), but this difference was not significant ( $Q = 1.5$ ,  $p = .22$ ; [Supplementary Figure 2](#)). There were no relevant studies from Buddhist countries for comparison.



TABLE 1. Characteristics of studies.

No.	Study	Country	Religion of the country	Place of study	Instruments assessing suicidal behavior	Study duration	Data collection year	Data collection method	Study setting	Level of students	Suicidal behavior	Sample size	M:F	Quality
1	Adhikari et al., 2017	Nepal	Hindu	Kathmandu	PHQ-9	3 months	2016–2017	Survey	Urban	University	Idea	343	1.04:1	Low
2	Ali, Uddin, Amran Hossain, & Uddin, 2022	Bangladesh	Islam	Dhaka	None	3 months	2021	Survey (online)	Urban and rural	University	Idea and attempt	731	1.05:1	High
3	Arafat, Hussain, Hossain, Islam, & Menon, 2022	Bangladesh	Islam	Dhaka, Noakhali	None	3 months	2021	Survey (online)	Urban	University	Attempt	529	1.07:1	Moderate
4	Arun & Chavan, 2009	India	Hindu	Chandigarh	Suicide Risk 11	Not available	Not available	Not available	Urban	School	Idea and attempt	2,402	1.32:1	Moderate
5	Arun et al., 2022	India	Hindu	South India	SBQ-R	1 month	2019	Survey	Urban	University	Idea, plan, and attempt	425	1.5:1	Moderate
6	Assanangkornchai, Mukthong, & Inanont, 2009	Thailand	Buddhism	Several regions	Youth Risk Behavior Surveillance	3 months	2007–2008	Survey	Urban and rural	School and college	Idea, plan, and attempt	50,033	1.17:1	Moderate
7	Bhola, Manjula, Rajappa, & Phillip, 2017	India	Hindu	South India	Functional Assessment of Self-Mutilation	Not available	Not available	Survey	Urban	School, college, and university	Attempt	1,571	1.36:1	High
8	Chaveepojkamjorn & Pichainarong, 2011	Thailand	Buddhism	Central Thailand	Youth Risk Behavior Surveillance	3 months	December 2007 to February 2008	Survey	Urban and rural	School	Idea and plan	5,184	Only male	Moderate
9	Chomon, 2022	Bangladesh	Islam	Dhaka	BD-HI	2 months	2022	Survey (online)	Urban	University	Idea	237	1.01	High
10	Dema, Tripathy, & Thinley, 2019	Bhutan	Buddhism	Nationwide	GSHS	Not available	2016	Survey	Urban and rural	School	Idea and attempt	5,809	1.29:1	High
11	Desai et al., 2021	India	Hindu	Western India	PHQ-9	1 month	2017	Survey	Urban	University	Idea	506	1.6:1	Moderate
12	EL-Maturity, 2021	Indonesia	Islam	Jakarta	C-SSRS	Not available	Not available	Not available	Urban	University	Idea and attempt	504	0.86:1	Moderate
13	Eskin et al., 2019	Indonesia	Islam	Not available	None	Not available	Not available	Survey	Not available	University	Idea and attempt	300	0.44:1	Low
14	Garg et al., 2022	India	Hindu	North India	PHQ-9, SBQ-R	2 months	2021	Survey	Nonspecific	University	Idea, plan, and attempt	531	5.47:1	High
15	Hasan, Hossain, & Gupta, 2022	Bangladesh	Islam	Dhaka	PHQ-9	6 months	2013	Interview	Urban	University	Attempt	221	0.63:1	Moderate
16	Irish & Mursind, 2020	Bangladesh	Islam	Nationwide	GSHS	Not available	2014	GSHS data analysis	Urban and rural	School	Attempt	2,883	0.67:1	Moderate
17	Khan et al., 2020	Bangladesh	Islam	Nationwide	GSHS	Not available	2014	GSHS data analysis	Urban and rural	School	Idea, plan, and attempt	2,989	1.88:1	Moderate
18	Mamun et al., 2022a	Bangladesh	Islam	Gopalganj	None	2 months	2019	Survey	Urban	University	Idea	665	2.1:1	Moderate
19	Mamun, Misti, Hosen, & Al-Mamun, 2022b	Bangladesh	Islam	Dhaka	None	10 days	2019	Survey	Urban	University	Idea, plan, and attempt	911	1.16:1	Moderate
20	Menezes et al., 2012	Nepal	Hindu	Pokhara	GHQ	1 month	2010	Survey	Urban	University	Idea, plan, and attempt	206	1.19:1	High
21	Mukhopadhyay, Mukhopadhyay, Sinhababu, & Biswas, 2012	India	Hindu	West Bengal	None	12 months	2008–2009	Survey	Urban and rural	School	Idea and attempt	2,068	2.37:1	Moderate
22	Nandagopan & Raddi, 2020	India	Hindu	Belagavi	ESSA Scale and Kutchner Depression Scale	Not available	Not available	Not available	Not available	School	Idea	1,204	Not available	High
23	Nath, Paris, Thombs, & Kirmeyer, 2012	India	Hindu	Gujarat	Economic Stress Scale and Caste and Community	Not available	Not available	Survey	Urban	College	Idea and attempt	1,817	0.72:1	Moderate

(continued)

TABLE 1. Continued.

No.	Study	Country	Religion of the country	Place of study	Instruments assessing suicidal behavior	Study duration	Data collection year	Data collection method	Study setting	Level of students	Suicidal behavior	Sample size	M:F	Quality
24	Pandey et al., 2019	Nepal	Hindu	Nationwide	GSHS	Not available	2015	Survey	Urban and rural	School	Idea and attempt	6,531	Not available	High
25	Pavani et al., 2021	India	Hindu	Not available	PHQ-9, SBC-R	1 month	2020	Survey	Not available	University	Idea, plan, and attempt	388	2.95:1	Moderate
26	Peltzer & Pengpid, 2012	Thailand	Buddhism	Nationwide	GSHS	Not available	2008	Survey	Urban and rural	School	Idea	2,758	1.02:1	High
27a	Peltzer & Pengpid, 2017	Indonesia	Islam	Nationwide	GSHS	Not available	2007	GSHS data analysis	Urban and rural	School	Idea	2,867	0.98:1	Moderate
27b	Peltzer & Pengpid, 2017	Myanmar	Buddhism	Nationwide	GSHS	Not available	2007	GSHS data analysis	Urban and rural	School	Idea	1,983	1:1	Moderate
27c	Peltzer & Pengpid, 2017	Thailand	Buddhism	Nationwide	GSHS	Not available	2008	GSHS data analysis	Urban and rural	School	Idea	2,223	0.98:1	Moderate
28a	Peltzer, Yi, & Pengpid, 2017	Indonesia	Islam	Yogyakarta	None	Not available	2015	Survey	Urban	University	Idea and attempt	231	0.31:1	High
28b	Peltzer et al., 2017	Myanmar	Buddhism	Not specified	None	Not available	2015	Survey	Urban	University	Idea and attempt	471	0.75:1	High
28c	Peltzer et al., 2017	Thailand	Buddhism	Not specified	None	Not available	2015	Survey	Urban	University	Idea and attempt	776	0.1:1	High
29a	Pengpid & Peltzer, 2020	Indonesia	Islam	Nationwide	GSHS	Not available	2015	GSHS data analysis	Urban and rural	School	Idea, plan, and attempt	11,105	Not available	Moderate
29b	Pengpid & Peltzer, 2020	Thailand	Buddhism	Nationwide	GSHS	Not available	2015	GSHS data analysis	Urban and rural	School	Idea, plan, and attempt	5,808	Not available	Moderate
29c	Pengpid & Peltzer, 2020	Timor-Leste	Christian	Nationwide	GSHS	Not available	2015	GSHS data analysis	Urban and rural	School	Idea, plan, and attempt	3,675	Not available	Moderate
30	Putra, Karim, & Ariastuti, 2019	Indonesia	Islam	Sumatera and Java	GSHS	Not available	2015	GSHS data analysis	Urban and rural	School	Idea and attempt	8,634	0.73:1	Moderate
31	Rahman, Saiful Islam, Mamun, Moonajilin, & Yi, 2022	Bangladesh	Islam	Dhaka	None	5 months	2019	Survey	Urban	University	Idea	407	1.18:1	High
32	Rasheduzzaman et al., 2022	Bangladesh	Islam	Dhaka	None	2 months	2019	Survey	Urban	University	Idea, plan, and attempt	1,844	2.25:1	Moderate
33	Saingam, Assanangkornchai, & Geater, 2012	Thailand	Buddhism	Nationwide	None	3 months	2007–2008	Survey	Urban and rural	School and college	Idea	50,033	1.18:1	Moderate
34	Senanayake et al., 2019	Sri Lanka	Buddhism	Nationwide	GSHS	2 months	2016	Survey	Urban and rural	School	Attempt	3,262	1.25:1	High
35	Sichantha & Jena, 2006	India	Hindu	Delhi	BDI	Not available	Not available	Not available	Not available	School	Idea and attempt	1,205	1.5:1	High
36	Singh, Manjula, & Philip, 2012	India	Hindu	Bangalore	SSI	11 months	2009–2010	Survey	Not available	College	Idea and attempt	436	1.57:1	Moderate
37	Swain, Mohanan, Sanah, Sharma, & Ghosh, 2014	India	Hindu	Southern India	YRBS	4 months	2011	Survey	Urban	School and college	Idea and attempt	381	1:1.12	High
38	Tareq et al., 2020	Bangladesh	Islam	Several places	BDI	6 months	2017	Survey	Urban	University	Idea	399	1.19:1	Moderate
39	Tanjim, Islam, Sujam, Sikder, & Potenza, 2020	Bangladesh	Islam	Non-specific	None	2 months	2020	Survey (online)	Not available	University	Idea and attempt	3,331	1.5:1	High
40	Tresno, Ito, & Mearns, 2012	Indonesia	Islam	Non-specific	Deliberative Self-Harm Inventory	Not available	Not available	Survey	Urban	University	Attempt	307	0.31:1	Moderate

PHQ = Patient Health Questionnaire; SBC-R = Suicide Behaviors Questionnaire-Revised; BDI-II = Beck Depression Inventory II; C-SSRS = Columbia-Suicide Severity Rating Scale; YRBS = Youth Risk Behavior Survey; SSI = Scale for Suicidal Ideation; GSHS = Global School-based Health Survey; GHQ = General Health Questionnaire.  
 Low = 0–3; moderate = 4–6; high = 7 and above.

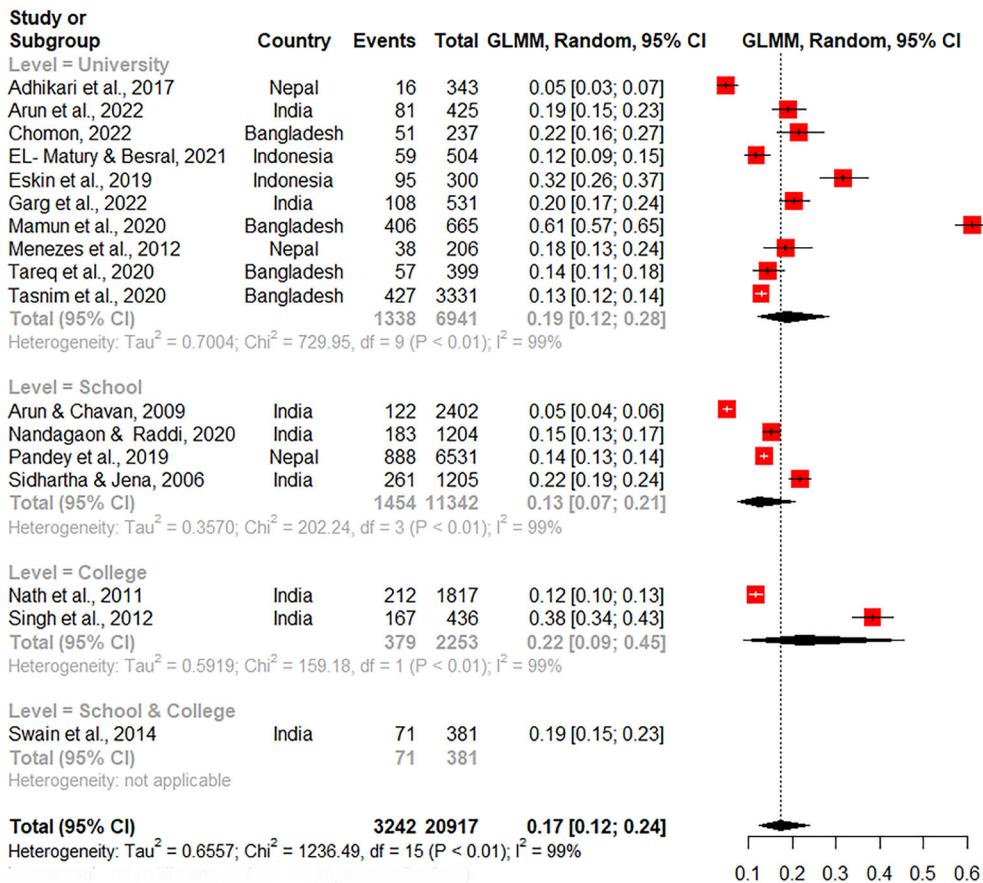


FIGURE 2. Pooled prevalence of suicidal thought in the lifetime.

### Twelve-Month Prevalence

The 12-month prevalence of suicidal ideation among students overall, based on 24 studies, was 9.33% (95% CI, 7.19%–12.04%; Figure 3). The 12-month prevalence was higher among university students (14.5%) than school students (7%), and this subgroup difference was statistically significant ( $Q = 11.51$ ,  $p = .0007$ ). Statistical heterogeneity was high ( $I^2 = 98.7\%$ ). Country-specific prevalence rates revealed the highest rate in India (18%) and the lowest rate in Myanmar (4%) (Supplementary Figure 3). In terms of the predominant religion of the country, the highest rate was in Hindu countries (16%) and the lowest was in Buddhist countries (8%), but these differences did not reach statistical significance ( $Q = 4$ ,  $p = .13$ ; Supplementary Figure 4).

### Point Prevalence

The point prevalence of suicidal ideation overall, based on three studies (Chavepojnkamjorn & Pichainarong, 2011, Thailand, school students, 4%; Desai, Chavda, & Shah, 2021, India, university students, 4%; Mamun et al., 2022a, Bangladesh, university students, 7%), was 4.84% (95% CI, 3.6%–6.41%). Heterogeneity was high ( $I^2 = 82.9\%$ ). Subgroup analysis was not done due to the small number of studies.

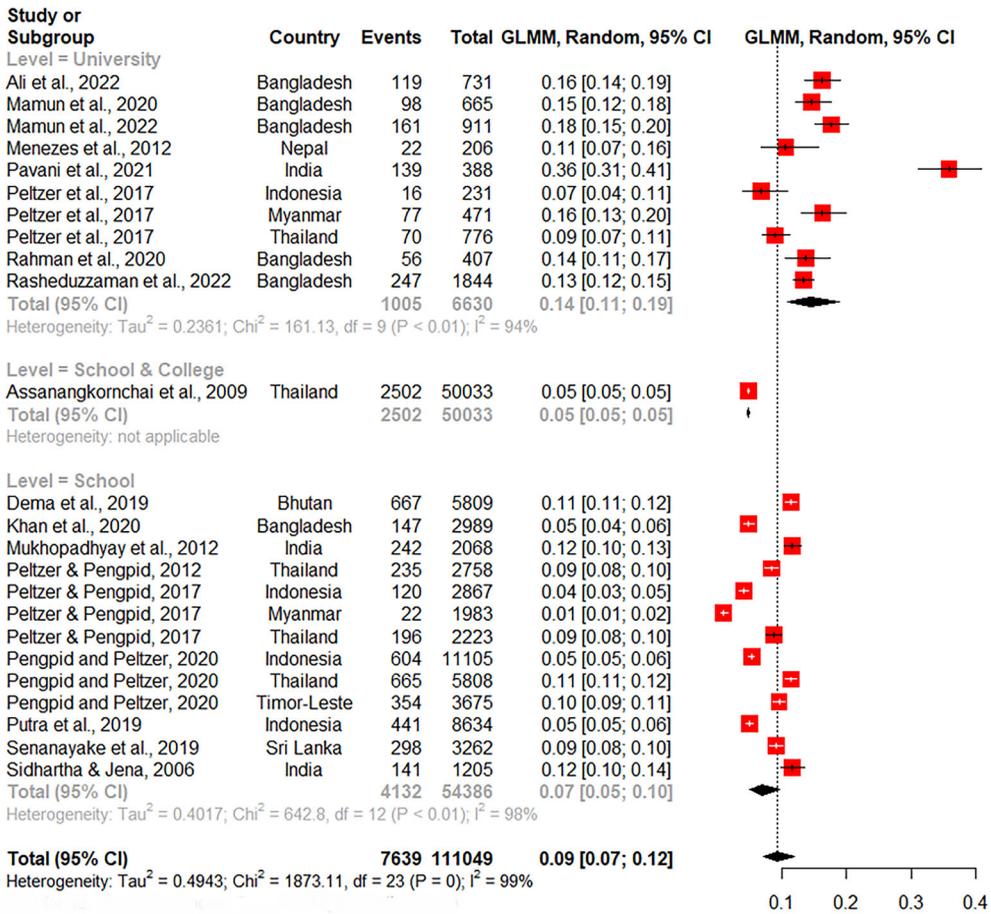


FIGURE 3. Pooled prevalence of suicidal thought in the last year.

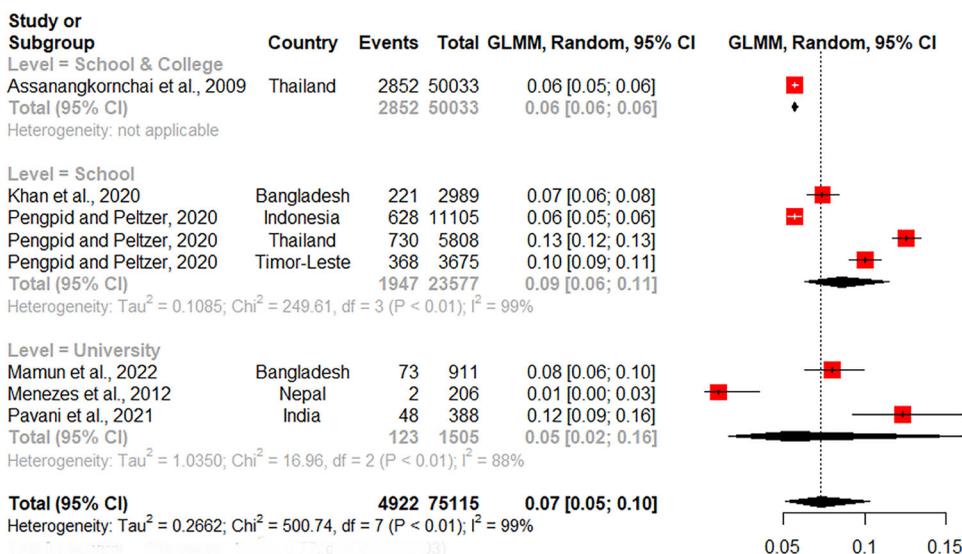
### Prevalence of Suicide Plans

#### Lifetime Prevalence

Based on three studies, the pooled lifetime prevalence of suicidal plans was 9.03% (95% CI, 6.25%–12.87%; Arun, Ramamurthy, & Thilakan, 2022, India, 12%; Garg, Chauhan, Singh, & Bansal, 2022, India, 10%; Rasheduzzaman et al., 2022, Bangladesh, 6%). All three studies were conducted among university students. Statistical heterogeneity was high ( $I^2 = 92.2\%$ ).

#### Twelve-Month Prevalence

Eight studies reported the 12-month prevalence of suicidal plans, and their pooled prevalence rate was 7.3% (95% CI, 5.12%–10.3%; Figure 4). The prevalence was numerically higher in school students (8.55%) than university students (5.26%), but this difference did not reach statistical significance ( $Q = 0.64, p = .423$ ). A high degree of heterogeneity was noted ( $I^2 = 98.6\%$ ). Country-specific prevalence rates revealed the highest rate in India (12%) and the lowest in Nepal (1%), but both these findings were based on single studies (Supplementary Figure 5). With regard to the predominant



**FIGURE 4.** Twelve-month prevalence suicide plan.

religion of the country, the highest rates were observed in Buddhist countries (14%), and the lowest were in Hindu countries (4%) (Supplementary Figure 6).

### Point Prevalence

A point prevalence of suicidal plans was reported by two studies (Chaveepojnkamjorn & Pichainarong, 2011, Thailand, school students, 5%; Desai et al., 2021, India, university students, 1%), generating a pooled prevalence of 2.3% (95% CI, 0.77%–6.69%). High heterogeneity was observed ( $I^2 = 91.5\%$ ).

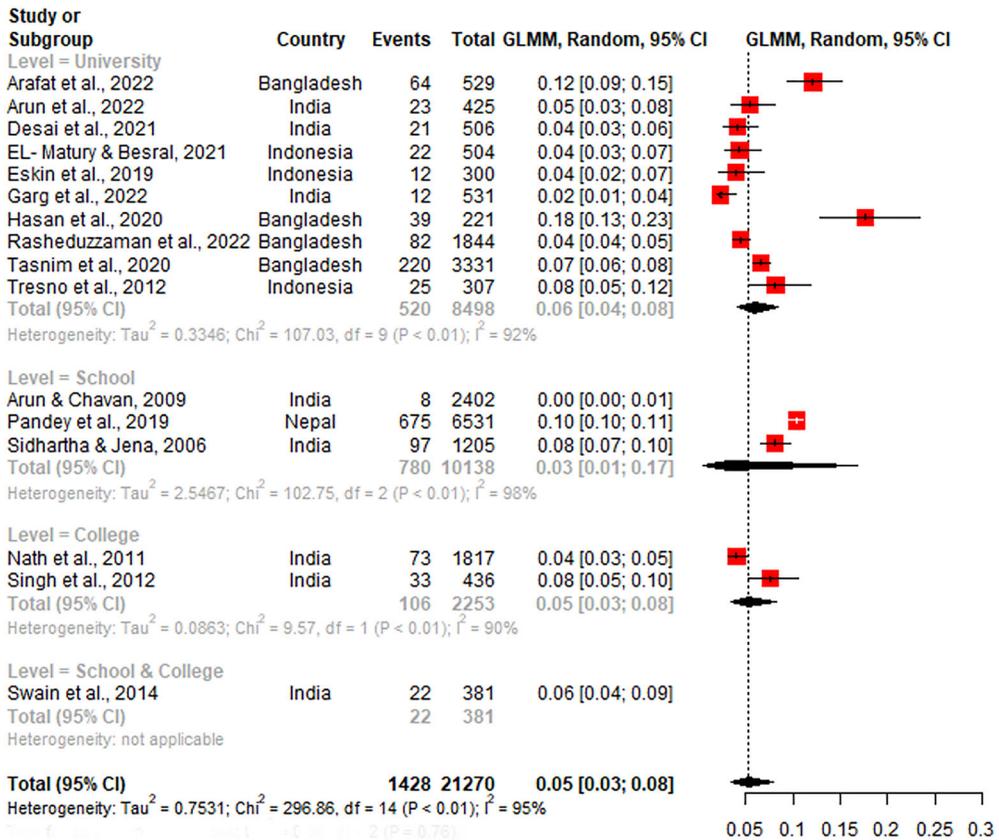
### Prevalence of Suicide Attempts

#### Lifetime Prevalence

The lifetime prevalence of suicidal attempts was reported in 16 studies, and their pooled prevalence rate was 5.24% (95% CI, 3.5%–7.77%; Figure 5). The majority of these studies ( $n = 10$ ) were conducted among university students. There was no statistically significant difference between subgroups. The degree of heterogeneity was high ( $I^2 = 95\%$ ). Comparison of country-specific prevalence rates revealed higher rates in Nepal (10%) and Bangladesh (9%), with lower rates reported in India (4%) and Indonesia (5%) (Supplementary Figure 7). With regard to the predominant religion of the country, a higher rate was observed in Islamic countries (7%) compared with Hindu countries (4%), but this difference was not statistically significant ( $Q = 2.4$ ,  $p = .12$ ; Supplementary Figure 8).

#### Twelve-Month Prevalence

According to 19 studies reporting the 12-month prevalence of suicidal attempts, the pooled prevalence rate was 4.48% (95% CI, 3.42%–5.85%; Figure 6). A higher prevalence was observed among school students (5.72%) and college students (5.67%) than



**FIGURE 5.** Lifetime prevalence of suicide attempt.

university students (2.78%), and these subgroup differences were statistically significant ( $Q = 13.8$ ,  $p = .001$ ). High heterogeneity was observed ( $I^2 = 98.6\%$ ). Country-specific prevalence rates revealed the highest rate in Bhutan (11%) and the lowest rate in Nepal (1%), but both these findings were based on single studies (Supplementary Figure 9). In terms of the predominant religion of the country, higher rates were seen in Christian (10%, albeit based on single study) and Buddhist countries (6%), but these country-wise differences did not reach statistical significance ( $Q = 3.3$ ,  $p = .18$ ; Supplementary Figure 10). Gender ratio in prevalence of suicidal attempts could not be calculated due to a lack of studies reporting separate data for male and female students.

**Moderator Analysis**

Moderator analyses were performed to test whether the gender composition (percentage of males) of study samples and the year of publication had moderating effects on prevalence estimates in the meta-analyses. Moderator analysis was not done if the total number of studies in a particular meta-analysis was fewer than 10, as was the case with meta-analyses on suicidal plans. Neither of the selected moderator variables (i.e., gender composition nor publication year) showed significant moderation effects.

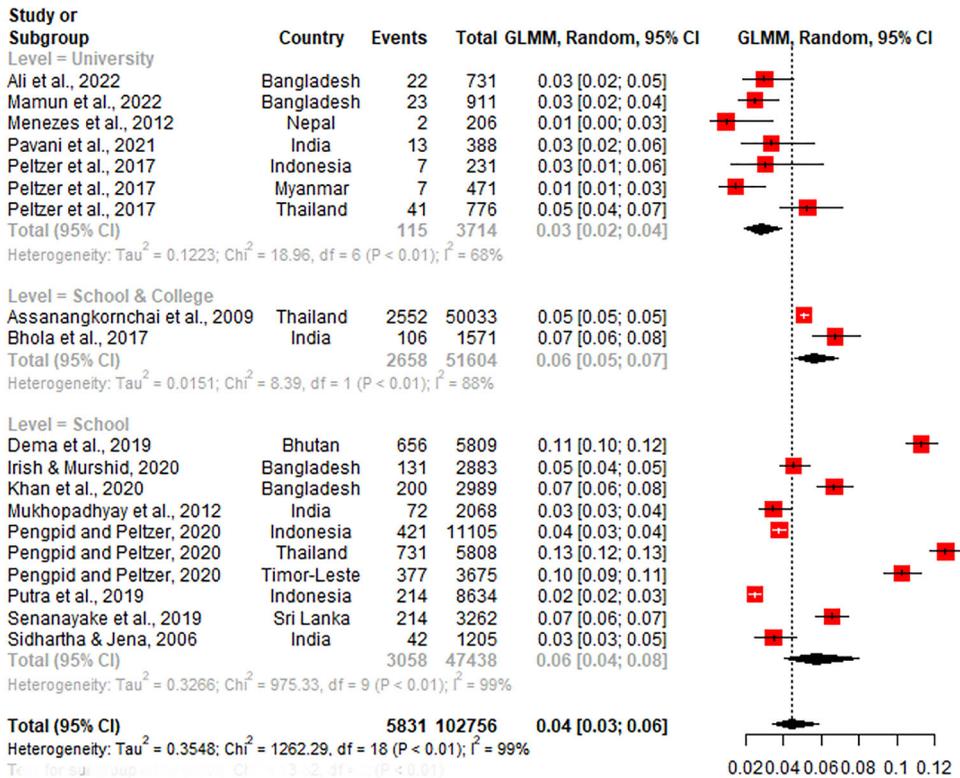


FIGURE 6. Twelve-month prevalence of suicide attempt.

### Sensitivity Analysis

Sensitivity analyses showed that the exclusion of low-quality studies (based on the quality assessment) from the relevant meta-analyses (applicable for lifetime prevalence of suicidal attempts and lifetime prevalence of suicidal ideation) did not lead to substantial changes in the pooled prevalence estimates.

### Publication Bias

Publication bias was assessed using funnel plots for meta-analyses with at least 10 studies. The findings of the Egger’s test of funnel plot asymmetry revealed that there was significant publication bias in the meta-analyses for lifetime prevalence of suicidal attempts ( $t = -2.76, p = .0154$ ) and 12-month prevalence of suicidal ideation ( $t = 2.63, p = .0149$ ), whereas no significant publication bias was noted for the lifetime prevalence of suicidal ideation ( $t = 0.65, p = .5278$ ) and 12-month prevalence of attempts ( $t = -0.77, p = .4502$ ).

### Study Quality Assessment

As per the modified Newcastle Ottawa Quality assessment scale for the cross-sectional study, the included studies quality review scores ranged from 3 to 8. Among 40

included studies, 15 studies (37.5%) had high methodology quality, 23 studies (57.5%) were of moderate quality, and 2 studies (5%) were of low quality.

## DISCUSSION

### *Main Findings of the Review*

In our meta-analyses of 17, 3, and 16 studies, we found that the pooled lifetime prevalence rates of suicidal ideation, plan, and attempts were 17.4%, 9.0%, and 5.2%, respectively; the corresponding figures for 12-month prevalence were 9.3%, 7.3%, 4.5%, respectively. This means that about one in six students have experienced ideas of taking their own life at some time in their life with more than half of them experiencing it in the year prior to questioning. Similarly, 1 in 20 have attempted suicide during their lifetime, with more than 80% attempting in the year prior to assessment. Prevalence of past-year suicide ideation was significantly higher among older university students compared with schoolchildren; however, these trends were reversed for past-year attempts. Importantly, our findings were robust to sensitivity analysis that analyzed only high-quality studies.

### *Implications of Findings*

Our findings provide substantial evidence that students in the SEAR are at a marked risk for suicidal thoughts and behaviors (STB). Notably, the rates we obtained are clearly higher than what have been reported in previous cross-national surveys among general population (Bernal et al., 2007; Nock et al., 2008) and adolescents (Peltzer & Pengpid, 2017). In addition, our results show a high proportion of transition across the STB spectrum: A high proportion of those with suicide ideation also reported plans and attempts. Interestingly, the STB transition rates we observed are higher than that reported in a recent meta-analysis of STB in young university students (Crispim et al., 2021). These findings are concerning because they indicate a threat to society's human resources and the need for interventions aimed at decreasing suicide and promoting positive mental health in the academic environment.

Unique social and cultural factors, such as family dynamics, may explain some of our findings. As an example, we found that past-year attempts were more among schoolchildren compared with university students. Prior research from Asian settings (Blum, Sudhinaraset, & Emerson, 2012) has shown that students living with parents were more likely to experience suicidal ideation compared to those living outside of their parents' home, including residing with relatives. This suggests that the protective effect of parental involvement and support on suicidality may be less effective for students in Asian cultural settings compared with elsewhere (Borowsky, Resnick, Ireland, & Blum, 1999). More research is needed to discern cultural differences in the effect of parental support on STB in this group.

A growing, consistent body of evidence links depression, prior psychiatric illness, history of substance use, parental neglect, and financial troubles with STBs among medical (Coentre & Góis, 2018) and non-medical university students (Pillay, 2021; Santos et al., 2017). Further, there is considerable reluctance among university students to seek

professional help for their mental health issues. Several structural, social, and academic barriers influencing health care-seeking behaviors have been identified in this group. These include self-reliance, stigma, poor mental health literacy, perceived lack of confidentiality, lack of time, lack of availability and accessibility of mental health services on campus, and preferences for informal “corridor” consultations (Arria et al., 2011; Lui et al., 2022; Menon, Sarkar, & Kumar, 2015).

Rather unexpectedly, we found that lifetime prevalence of suicide-related thoughts was greater in Islamic countries compared with Hindu nations, which was replicated in the country-specific analysis. Specifically, we found that the lifetime prevalence of suicide-related thoughts was higher in Bangladesh and Indonesia compared with both India and Nepal. Although we are not sure of the exact reasons for this phenomenon, our findings align with prior investigations of self-reported STBs among university students in Muslim-majority nations, which found higher rates of STBs in these nations compared with the United States and China (Eskin et al., 2019). Muslim nations have, in the last decade, faced serious social and economic upheavals. The volatile and threatening living conditions coupled with political instability, lack of adequate opportunities, scarcity of resources, curtailment of individual liberties, and gender discrimination may possibly explain the high rates of STBs. Interestingly, differences in prevalence of lifetime attempts and plans between Hindu and Muslim nations were less pronounced: Indeed, prevalence of lifetime attempts were comparable across these nations, while prevalence of 12-month plans were highest in India followed by Timor-Leste, Thailand, Bangladesh, Indonesia, and Nepal. Admittedly, the small number of studies in some of the subgroups limits the inferences that can be drawn, and our findings of prevalence among Muslim and non-Muslim countries were not statistically significant. Nonetheless, they point to some interesting trends.

First, students in Muslim nations in SEA are as prone as their counterparts in non-Muslim nations to experience suicide-related thoughts. This phenomenon may be attributed to shared challenges that students in the SEAR face in relation to campus infrastructural facilities and academic life (such as problems with accommodation and ragging [abuse by seniors], financial hardships, and lack of adequate opportunities for career progression due to a demand-supply mismatch); indeed, many of these issues were highlighted by prior researchers who examined mental health and well-being among students in Bangladesh (Bhuiyan, Griffiths, & Mamun, 2020; Mamun et al., 2022a) and Indonesia (Kloping, Citraningtyas, Lili, Farrell, & Molodynski, 2022; Kotera et al., 2022).

Next, this group may experience lower levels of transition to plans and attempt than their counterparts. This may be explained by the moderating effect of religion, which may be more robustly protective against suicide attempts than suicide ideation. This assertion is supported by findings in literature that religion may prevent people from acting on their suicidal ideas by providing a supporting network, instilling hope, and offering alternate interpretations of suffering (Lawrence, Oquendo, & Stanley, 2016; Wu, Wang, & Jia, 2015).

Drawing on our findings and the growing evidence for campus-based suicide prevention activities, we offer a few recommendations to improve student mental health in the SEAR. These can be grouped into universal, selective, and indicated prevention

strategies in alignment with a public health framework. Evidence-based universal prevention strategies on campuses include interventions aimed at improving suicide-related knowledge, attitudes, positive life skills education, and stigma against suicide among students (Arafat & Kabir, 2017; Breet, Matooane, Tomlinson, & Bantjes, 2021; Schilling, Aseltine, & James, 2016). Selective prevention strategies comprise gatekeeper training programs for both students and staff aimed at improving awareness about suicide and warning signs, ability to provide support to a distressed peer, and where to seek help (Lamis, Underwood, & D'Amore, 2017; Rallis et al., 2018). Evidence-based indicated prevention strategies are internet-based cognitive-behavior therapy (Hetrick et al., 2017), dialectical behavior therapy (Pistorello, Fruzzetti, MacLane, Gallop, & Iverson, 2012), interpersonal therapy (Tang, Jou, Ko, Huang, & Yen, 2009), and problem-solving therapy (Xavier, Otero, Blanco, & Vázquez, 2019). However, given that much of the evidence for these approaches come from high-income countries, there is a need to culturally adapt and test campus-based suicide prevention models in low-resource settings in the SEAR. This will help develop culturally compatible prevention approaches that have better uptake and efficacy.

### **Limitations**

Our review has some key limitations. Underreporting of suicide due to stigma and lack of efficient civil registration systems may have affected individual study estimates. The variations, both within and between countries, may be attributed to methodological heterogeneity across studies arising from variations in instruments used apart from country-specific cultural and socioeconomic factors. Some of our findings need to be interpreted with caution due to the limited number of studies in many subgroups. Publication bias may be relevant to our review as we have only searched scientific databases that were available to us and statistical testing for publication bias was not possible due to the limited number of studies.

### **CONCLUSIONS**

Our findings suggest that students in the SEAR commonly experience the full range of suicidal behaviors. Several structural, systemic, and cultural factors may explain this phenomenon. Further, there is a high rate of suicide transition across the spectrum of suicidal behaviors in this group. Notwithstanding the high heterogeneity and limited number of studies in the main analyses, our results highlight the importance of an integrated, multisectoral approach combining universal, selective, and indicated interventions to address the malaise of suicide and promote positive mental health among students in SEAR countries.

### **AUTHOR CONTRIBUTIONS**

Conceptualization: S. M. Yasir Arafat.

Data curation: S. M. Yasir Arafat, Pawan Sharma, Mila Nu Nu Htay, Hasina Akter, M. Marthoenis.

Formal analysis: Anuradha Baminiwatta, Vikas Menon.

Investigation: S. M. Yasir Arafat.  
Methodology: S. M. Yasir Arafat.  
Project administration: S. M. Yasir Arafat.  
Supervision: S. M. Yasir Arafat.  
Validation: S. M. Yasir Arafat.  
Writing–original draft preparation: all authors.  
Writing–review and editing: all authors.  
All authors have read and approved the final version of the manuscript.

## TRANSPARENCY STATEMENT

The lead author, S. M. Yasir Arafat, 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 have been explained.

## DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author(s).

## AUTHOR NOTES

S. M. Yasir Arafat, Department of Psychiatry, Enam Medical College and Hospital, Dhaka, Bangladesh. Anuradha Baminiwatta, Department of Psychiatry, Faculty of Medicine, University of Kelaniya, Sri Lanka. Vikas Menon, Additional Professor Department of Psychiatry, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India. Pawan Sharma, Patan Academy of Health Sciences, Lalitpur, Nepal. Mila Nu Nu Htay, Department of Community Medicine, Manipal University College Malaysia, Melaka, Malaysia. Hasina Akter, Department of Graduate Nursing, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. M. Marthoenis, Department of Psychiatry and Mental Health Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia. Chench Dorji, Faculty of Post-Graduate Medicine, Khesar Gyalpo University of Medical Sciences of Bhutan, Thimphu.

Correspondence concerning this author should be addressed to S. M. Yasir Arafat, Department of Psychiatry, Enam Medical College and Hospital, Dhaka-1340, Bangladesh. Email: [arafatdmc62@gmail.com](mailto:arafatdmc62@gmail.com)

## ORCID

S. M. Yasir Arafat  <http://orcid.org/0000-0003-0521-5708>  
Anuradha Baminiwatta  <http://orcid.org/0000-0002-5495-2029>  
Vikas Menon  <http://orcid.org/0000-0001-8035-4658>  
Pawan Sharma  <http://orcid.org/0000-0003-4983-7568>  
Mila Nu Nu Htay  <http://orcid.org/0000-0003-2506-3473>  
Hasina Akter  <http://orcid.org/0000-0003-3412-934X>  
M. Marthoenis  <http://orcid.org/0000-0001-7322-2585>  
Chench Dorji  <http://orcid.org/0000-0001-9547-0803>

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

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