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Suicidal behaviours and associated factors among medical students in Bangladesh: a protocol for systematic review and meta-analysis (2000–2024)

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ABSTRACT

Introduction Suicidal behaviour is common among medical students, and the prevalence rates might vary across various regions. Even though various systematic reviews have been conducted to assess suicidal behaviours among medical students in general, no review has ever assessed or carried out a sub-analysis to show the burden of suicidal behaviours among Bangladeshi medical students.

Methods and analysis The research team will search the PubMed (Medline), Scopus, PsycINFO and Google Scholar databases for papers published between January 2000 and May 2024 using truncated and phrase-searched keywords and relevant subject headings. Cross-sectional studies, case series, case reports and cohort studies published in English will be included in the review. Review papers, commentaries, preprints, meeting abstracts, protocols and letters will be excluded. Two reviewers will screen the retrieved papers independently. Disagreements between two reviewers will be resolved by a third reviewer. Exposure will be different factors that initiate suicidal behaviours among medical students. The prevalence of suicidal behaviours (suicidal ideation, suicide plans and suicide attempts) in addition to the factors responsible, and types of suicide method will be extracted. Narrative synthesis and meta-analysis will be conducted and the findings will be summarised. For enhanced visualisation of the included studies, forest plots will be constructed. Heterogeneity among the studies will be assessed and sensitivity analysis will be conducted based on study quality. Included studies will be critically appraised using Joanna Briggs's Institutional critical appraisal tools developed for different study designs.

Ethics and dissemination The study will synthesise evidence extracted from published studies. As the review does not involve the collection of primary data, ethical approval will not be required. Findings will be disseminated orally (eg, conferences, webinars) and in writing (ie, journal paper).

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INTRODUCTION

Suicidal behaviour is a broad term that includes three subcategories (1) suicide ideation (SI), which refers to thoughts of wanting to end one's life; (2) suicide plan (SP), which refers to the formulation of a specific method to die and (3) suicide attempt (SA), which refers to engaging in potentially self-injurious behaviour with at least some intent to die or with a non-fatal outcome.[1 2] According to the World Health Organization (WHO), approximately 77% of suicides occur in low-income and middle-income countries (LMICs). Suicide rates in Southeast Asia (10.2 per 100,000) were higher than the global average (9.0 per 100,000) in 2019 due to population growth and population age structure.[3] Suicide ranks as the fourth largest cause of death for those between the ages of 15 and 29 years and claims more lives annually than HIV, malaria, breast cancer, war and murdered individuals.[4]

According to the 2022 Bangladesh Education Statistics, out of 174,888 students and 826 institutions, 28.93% of students were admitted to medical college, and 4.11% to dental college, with approximately two-thirds being female (64.42%).[5] Bangladesh is considered as a hub of medical studies in

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The present study will be a rigorous systematic review and meta-analysis focusing on the prevalence of suicidal behaviours and associated factors among Bangladeshi medical students.
⇒ The Cochrane Handbook's strict methodology will be followed, and the results will be published in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement.
⇒ The review will only include peer-reviewed papers containing primary data reporting Bangladeshi medical students in the selection of the studies.
⇒ Most studies will comprise self-reported data, which are subject to various methodological biases.
⇒ The potential low quality of the individual studies may limit the conclusions that can be made.

south-east Asia. However, medical students appear to have had greater suicide rates (up to 3–5 times higher) than the general community over the past 130 years, with some estimates being even higher.[6 7] In addition, systematic reviews and meta-analyses have reported a high prevalence of suicidal behaviours among medical students ranging from 3.8% to 18.7%, compared with university student's 9.0%–9.7%.[1 8 9] Although, the number of suicides among medical students has been little studied globally,[10] surveys show that Bangladeshi public and private medical students' suicidal ideation ranging from 23.8% to 27.4%,[11 12] which is of concern. However, according to several study findings, medical students in Austria, Turkey, Pakistan and China had, respectively, rates of suicide thoughts and attempts within a year of 11.3% and 0.3%, 12% and 2.1%, 35.6% and 4.8%, and 8.2% and 4.3%.[13 14]

Such rates may be because medical school teaching and learning environments are highly competitive, with high expectations for achievement from students, teachers and parents alike. Furthermore, since many psychiatric illnesses among adults begin around the age of 24 years (when medical students are at the height of their training), it is possible that the high incidence of psychiatric disorders among medical students may result from this.[13] One study reported that 33.5% of Bangladeshi medical students had poor mental health status,[15] and another reported that 39.1% of Bangladeshi medical students had various degrees of depression.[16] In contrast, a web-based study reported 80.2% of Bangladeshi medical students had moderate to severe depression symptoms.[17] In other countries, a systematic review reported that the prevalence of depression among medical students in China was 32.74%, in Turkey 39%, in Nepal 29.9%, in Egypt 65% and outside North America 7.7%–65.5%.[18–20] Psychiatric disorders (primarily depression) contribute greatly to suicidal behaviour and are among the most important risk factors for suicidality.

Throughout the world, the study of medicine is seen as being intrinsically difficult and demanding[21] due to the pressures of the classroom, overexpectations,[13] the demands of the workplace, burn-out and depression (particularly among younger doctors), as well as the ongoing trouble of balancing job, family and financial obligations.[7] In addition, other factors that contribute to suicidal behaviour among medical students include chronic stress,[22] poor mental health status,[15] academic stress, familial pressure, depression,[10] relationship status, drug addiction, alcohol use,[12] online addictions,[23] sleeping difficulties, thoughts of dropping out, physical or sexual assault,[1] parenting style[24] and family history.[10 11]

The under-reporting of suicides is a well-known phenomenon in the field of suicidology, potentially complicating the accurate estimation of medical student suicide rates.[25] A meta-analysis of the prevalence of suicide behaviours among Bangladeshi medical students has never been previously conducted, even though numerous reviews have been carried out evaluating suicidal behaviours among medical students and university students more generally. Although numerous studies have reported on suicide behaviours in Bangladesh, as aforementioned, no meta-analysis has previously examined the factors contributing to suicidal behaviours among medical students in Bangladesh.

AIM AND RESEARCH QUESTION

The overall aim of this systematic review and meta-analysis is to meta-analyse the prevalence of suicidal behaviours (suicidal ideation, suicidal attempts and suicidal plans), factors associated with suicidal behaviour and methods used for suicidal behaviours among the medical students of Bangladesh. The Joanna Briggs Institute (JBI) mnemonic, Condition, Context and Population,[26] was used to formulate the research question. Here, the condition is suicidal behaviour (SI, SP and SA), the context is Bangladesh and the population is Bangladeshi Medical students. The research question is 'What is the prevalence of suicidal behaviours (SI, SP and SA) among medical students of Bangladesh?'

METHODS
Study design

This systematic review protocol will be conducted using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Protocols 2015 guidelines[27] and the Meta-analysis of observational studies in Epidemiology guidelines for systematic review and meta-analysis of observational studies.[28] The protocol has been registered in PROSPERO (CDR 42023493595).

Eligibility criteria

The study will include all empirical studies with available full texts, published from 1 January 2000 to May 2024. This time frame ensures a comprehensive inclusion of recent research while capturing a substantial body of literature for the systematic review and meta-analysis. All papers published in English with human participants will be considered. Cross-sectional studies, case series, case reports and cohort studies will all be included in this study. Studies concerning university students who did not specify the exact number of medical students who had suicidal behaviour will be excluded. Review papers, study protocols, books, chapters, preprints, meeting abstracts, commentaries, letters and editorials will also be excluded.

Information sources

Using comprehensive and advanced search strategies, the research team will search the major databases including Medline (PubMed), Scopus, PsycINFO and Google Scholar. The search strategy will include terms related to exposure and outcome, and built-in filters in the databases will be used to customise the final search output.
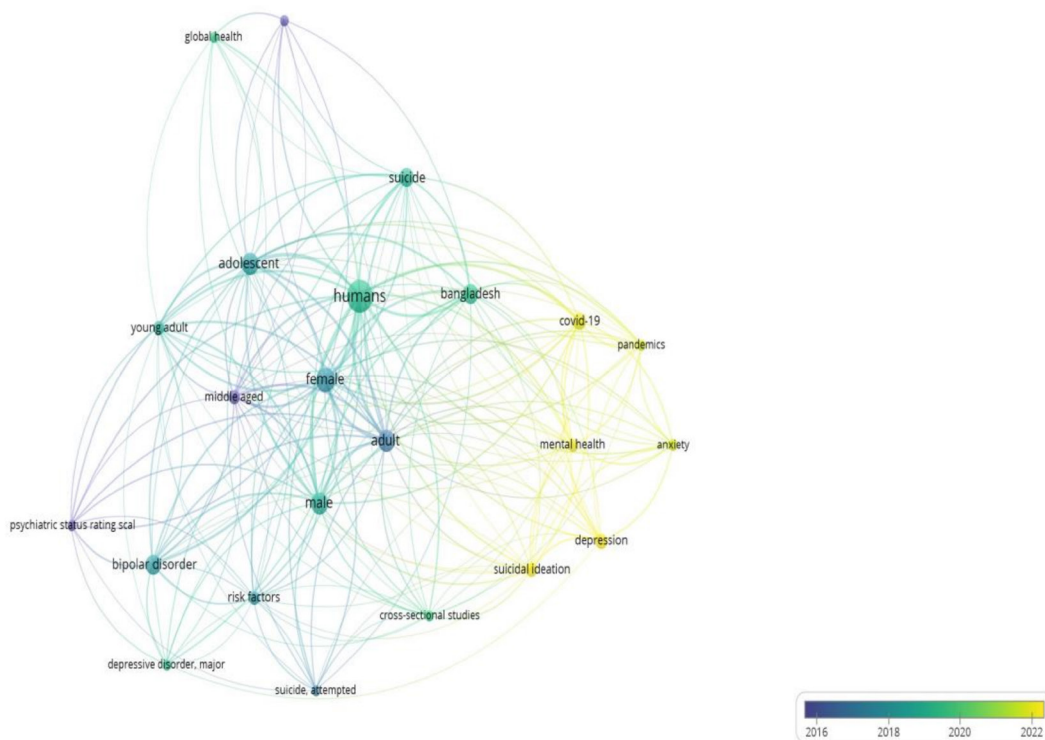
Figure 1 Cluster analysis showing searched keywords from PubMed database.

Search strategy

A comprehensive search strategy has been developed in consultation with an expert systematic reviewer which will be adapted for selected bibliographic databases in combination with a combination of Medical Subject Headings (MeSH), keyword terms and filters (Figure 1) using the VOSviewer software tool visualising bibliometric networks.[29] The tentative search strategy for different databases is presented in Table 1 summarising the key search terms for population and outcome. All studies published in English will be considered for inclusion in the meta-analyses.

Condition/domain being studied

The conditions being studied include suicidal behaviours and medical students from Bangladesh.

Population/participants

The review will include studies of all ethnicities, genders and all over the country including medical students (bachelor in medicine, bachelor in dental surgery),

undergraduate medical students, intern doctors, preclinical students, clinical students, and residency or non-residency medical graduate trainees.

Exposure

Being a medical student.

Comparator(s)/control

Not applicable. There will be no comparison group.

Context

Understanding suicidal behaviour and associated factors among Bangladeshi medical students.

Exclusion criteria

The types of output that will be excluded include:
1. Review papers, study protocols, books, chapters, preprints, meeting abstracts, commentaries, letters and editorials.
2. Full-text inaccessible studies.
3. Papers not published in the English language.
4. Studies regarding university students without specifying the exact number of medical students with suicidal behaviour.
5. Any relevant studies published before 1 January 2000.

The population/participants that will be excluded include:
1. Non-medical students.
2. Medical students outside Bangladesh.

Outcome

The primary outcome will be to identify the prevalence of suicidal behaviours and its associated factors. The

Table 1 Key terms which will be used for developing search strategy

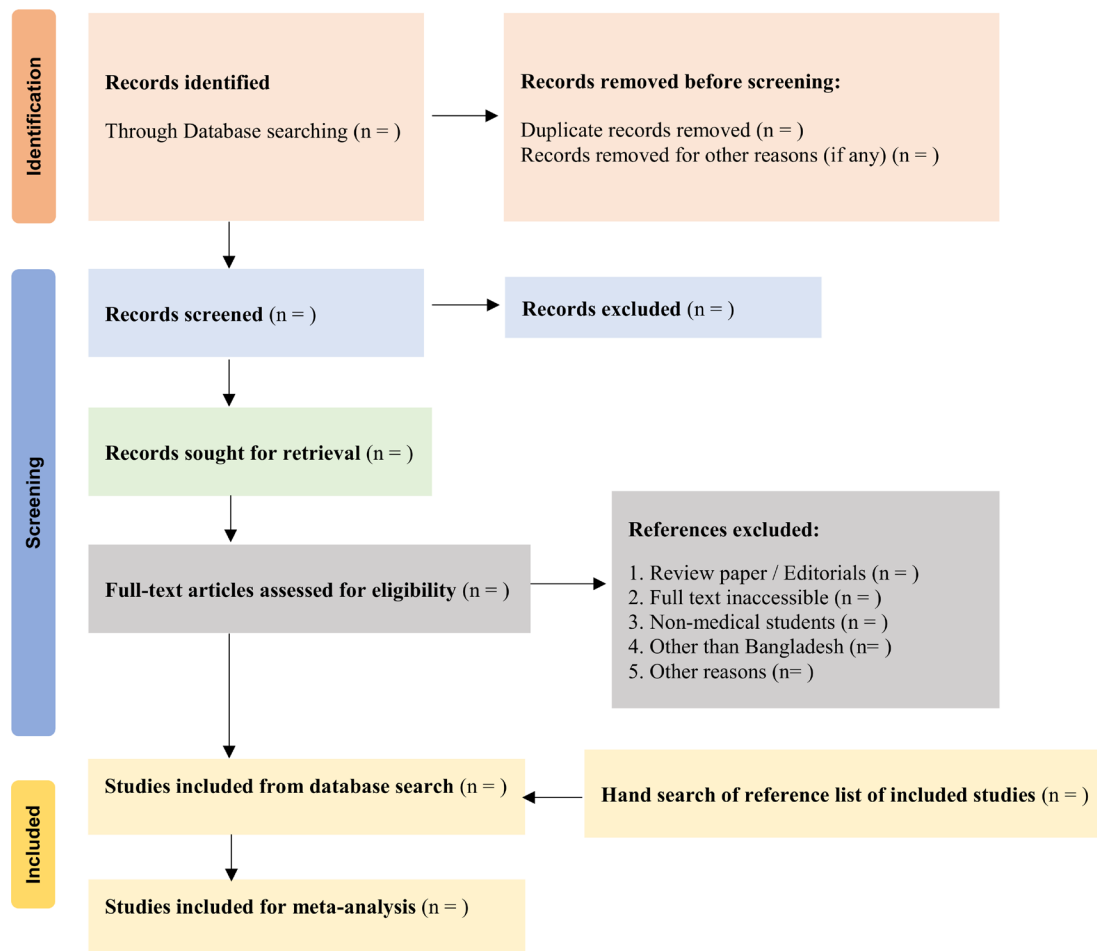| Population (P)	Outcome (O)
'Bangladeshi medical students'	'Suicidal behavior' 'Suicidality'
	'Suicidal plan' 'Self-murder'
	'Suicidal ideation' 'Completed suicide'
	'Suicidal thoughts' 'Attempted suicide'

Figure 2 PRISMA flow diagram of study selection process. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

secondary outcome will be to address the methods used for suicide (hanging, poisoning, etc.) among the medical students of Bangladesh.

Study records
Data management
EndNote V.21.0 reference management software (Clarivate Analytics, Philadelphia, USA) will be used to compile the papers retrieved from the comprehensive literature search.[30] The search results from the databases and relevant references (if needed) will be combined and duplicate articles will be removed. The remaining papers will be exported to the web-based application 'Rayyan QCRI' to facilitate article screening and collaboration among the reviewers.[31] Citation abstracts and full-text papers will be uploaded to Rayyan web application.

Selection process
To identify the studies that qualify, two independent reviewers (SS, ATS) independently checked the titles and abstracts of all retrieved papers. Then, for the final inclusion, both the independent reviewers will examine the full-text papers of the qualifying research. A third reviewer will settle any disagreements that the two reviewers have. There will be a log of the reasons for

exclusion. PRISMA flow diagrams (Figure 2) will be used to illustrate a summary of the research paper list for inclusion and exclusion.[32]

Data extraction
Data extraction will be conducted using a Microsoft Excel spreadsheet (Microsoftn, Washington, USA). To present individual study characteristics and participant characteristics, descriptive statistics and qualitative narrative analysis will be used. To determine the pooled prevalence of suicidal behaviours, a random effect meta-analysis will be performed using R statistical package V.4.3.2 in-built meta-packages based on the number of students who have various suicidal behaviours. Assuming that the selected studies will be convenience samples from a larger population, a random-effects model will be used to generalise findings beyond the included studies.[33]

Risk of bias (quality) assessment
The JBI Critical Appraisal Checklist will be used to assess study quality.[34 35] The Cochran's Q statistic and the I^2 statistic will be used to assess between-study heterogeneity. The studies' heterogeneity will be examined using prediction intervals for a comprehensive assessment. The results will be displayed on forest plots, and funnel plots

will be created to visually assess publication bias. Two review authors will independently assess the risk of bias in studies being considered after full-text review. Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with the involvement of a third review author where necessary.

Strategy for data synthesis

An electronic search will be performed using PubMed, Scopus, PsycINFO and Google Scholar databases combining the main key elements of the Population, Exposure, Comparator and Outcomes inclusion criteria. To develop the search strategy, a list of relevant index terms and keywords will be derived from the existing database, relevant literature and combined Boolean operators, truncations and explode functions. In consultation with experts in systematic review, the search strategy will be refined accordingly. A total of almost 690 studies were yielded from a preliminary search conducted on 9 December 2023. All included studies will be summarised and tabulated for data extraction. Egger's test and funnel plots will be conducted to examine the possibility of publication bias. Moreover, a subgroup analysis will be conducted to calculate the pooled prevalence of suicidal behaviours across different study characteristics. In addition, a narrative synthesis will be carried out in the event that quantitative synthesis is not possible.

Patients and public involvement

This is a protocol for systematic review and no patients will be directly involved in this review. This review will be done to identify the prevalence of suicidal behaviours and their associated factors which influence SI, SA and SP among Bangladeshi medical students which has been a matter of concern.

Ethics and dissemination

The study will synthesise evidence extracted from published studies. As the review does not involve the collection of primary data, ethical approval will not be required. A manuscript will be developed and submitted to an international peer-reviewed journal for publication based on the PRISMA statement as well as the PRISMA for Network Mata-Analyses (PRISMA-NMA guidelines. In addition, the findings may also be verbally disseminated (eg, conferences, webinars).

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