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Academic stress and sleep among first year and preclinical medical students: a qualitative evidence synthesis

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Research Article

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Abstract

Background

The first year of medical school combines a heavy academic load with a major life transition, and poor sleep is common from the earliest weeks of training. Survey research shows that stress and poor sleep occur together but says little about how students experience the relationship. This rapid qualitative evidence synthesis examined recent qualitative evidence on how first year and preclinical medical students experience academic stress and sleep.

Methods

Ten searches of open access sources identified qualitative and mixed methods studies published from 2021 onward. Selection, appraisal with the Critical Appraisal Skills Programme checklist, and thematic synthesis were carried out by one reviewer. Reporting followed the Enhancing Transparency in Reporting the Synthesis of Qualitative Research statement. The protocol was not registered.

Results

The searches returned 95 records, of which 66 were screened after removal of duplicates and 14 were assessed in full. Seven studies from the United Kingdom, the United States, India, Brazil and Malaysia were included. Only one study sampled first year students exclusively, and sleep was the main focus of two. Four analytical themes were developed: entering a layered transition; sleep as the negotiable resource; a mind that will not switch off; and coping, culture and connection. Students described sleep as the first resource surrendered to academic demand, and one study described peer norms that framed early rest as weak commitment. Worry about examinations carried into the night, and poor sleep in turn eroded concentration and emotional control, a cycle that students felt powerless to interrupt. Relationships and flexible support were described as buffers, whereas caffeine, late screen use and mandated wellness activities offered little relief.

Conclusions

In a small evidence base, academic stress and sleep loss were described as one entangled problem rooted in academic culture rather than individual weakness. The findings are tentative because the search was limited to open access sources and one reviewer carried out selection, appraisal and synthesis. Medical schools may wish to consider pacing first year assessment, keeping timetables predictable, discussing late night study norms openly and offering flexible support. Studies that follow first year cohorts are needed to test these findings.

Background

Starting medical school asks a great deal of young people in a short space of time. Within a few months, most first year students must absorb a dense scientific curriculum, sit frequent assessments, settle into new living arrangements and begin to see themselves as future doctors. Picton et al. [1] described the first year as a critical transition in which students must adapt at once to being university students, medical students and doctors in training. Survey evidence suggests that this adjustment is often painful. In a nationwide Indian study conducted in 2023, 67% of 401 first year MBBS respondents met screening criteria for adjustment disorder within six months of enrolment, with time pressure, workload, financial problems and moving home among the leading stressors [2]. At the University of Nottingham, first year students reported better physical health and mood after a curriculum change, yet their perceived stress rose over the first semester, which the authors linked to frequent formative assessment and constant comparison with peers [3]. Stress is common across settings. A multicentre Egyptian survey of 2,465 students found that 86.5% were stressed, nearly half at a severe level [4], and a review of systematic reviews focused on United Kingdom medical schools grouped the causes into academic pressure, institutional factors, personality traits, social relationships and financial strain [5]. Among 125 first year MBBS students in Eastern India, male students reported greater academic and interpersonal stress than their female peers [6], and stress, its sources and coping have also been mapped in a Pakistani medical school [7].

The pandemic added a further layer. Students admitted in early 2021 at an institute in North India began their training in a largely online, hybrid format [8], and a Saudi study compared depressive and anxiety symptoms between first and fifth year students during the same period [9]. A meta analysis of 130 studies and more than 132,000 medical students estimated pooled prevalences of 45% for anxiety and 48% for depression during the pandemic, with a nonsignificant tendency toward higher rates in the preclinical years [10]. An earlier synthesis found that these rates exceeded those of the general population and of health workers [11], and reviews of university students have examined how anxiety and depression changed as mitigation measures were introduced and lifted [12].

Sleep is one of the first casualties of this pressure. A meta analysis of 109 studies involving 59,427 participants documented sleep problems among medical students across many countries [13]. Poor sleep has been described in Nepal, where 38.2% of 212 undergraduate medical students were poor sleepers [14], in China, where prevalence varied by region [15], in India during pandemic confinement [16], and in Brazil, where 37.8% of students showed mild and 8.7% moderate or severe daytime sleepiness [17]. Early training appears to be a period of particular vulnerability. In a Saudi sample, students in the foundational and junior years reported significantly more insomnia symptoms and poorer sleep quality than senior students [18]. Wearable tracking of first year osteopathic students showed that they slept about an hour less per day during examination weeks and rated their sleep as poorer, compensating with naps and weekend sleep [19]. A mixed methods study in India reported poor sleep quality in 57% of 380 medical students [20].

Stress and poor sleep rarely travel alone. Across 22 Brazilian medical schools, students reporting more sleep deprivation had greater odds of anxiety and depressive symptoms [17]. In a survey of 1,021 Chinese medical students, anxiety and depressive symptoms accounted for 73.08% of the association between perceived stress and sleep quality [21], and among clinical stage students in Iraq nearly a quarter reported severe anxiety, with stress negatively correlated with academic performance [22]. The transactional model of stress proposes that stress arises when a demand is appraised as exceeding a person's resources, and that coping follows from that appraisal [23]. In the Nepalese survey, poor academic achievement was itself associated with poor sleep [14], which is consistent with a loop in which academic difficulty and sleep loss reinforce each other.

Responses to these pressures have been studied mainly through interventions and in later years of training. In Vietnam, a ten week programme combining psychoeducation and mindfulness for 409 first year students improved stress mindset and several coping strategies, although the programme required substantial institutional support [24]. A meta analysis of 22 randomised trials in university students found that psychological treatments improved sleep quality ($g = 0.50$), with cognitive behavioural therapy for insomnia outperforming mindfulness approaches ($g = 0.72$ versus $g = 0.16$) [25]. University students consulted about the design of a sleep intervention named irregular routines, academic workload and competing demands as the main drivers of their difficulties [26]. Qualitative work in later years shows how context shapes coping: fourth year students in the United Kingdom lost the activities they relied on to recover as the pandemic intensified academic pressure [27], and students across transitions in American undergraduate medical education described factors and coping strategies that differed from one transition to the next [28]. Students' views on how their wellbeing should be measured have also been studied [29].

Survey research therefore establishes that stress and poor sleep are common and linked, but it cannot show how students make sense of the relationship: why sleep is surrendered, what keeps them awake, and which responses help or make matters worse. Qualitative studies that could answer these questions are scattered. Many recruit students from all years together, most treat sleep as a secondary topic, and few focus on the first year. The period since 2021 also spans the disruption of the COVID-19 pandemic and the return to campus, which reshaped the routines of students who began training at that time [30]. To our knowledge, no synthesis has focused specifically on recent qualitative accounts from first year and preclinical medical students on academic stress and sleep. This review therefore asked how first year and preclinical medical students experience academic stress and sleep, and how they understand the relationship between the two.

Methods

Design

A rapid qualitative evidence synthesis was conducted using the thematic synthesis approach of Thomas and Harden [31]. The term rapid is used because methods were streamlined: searching was limited to

open access sources, and one reviewer carried out selection, appraisal and coding. Reporting follows the Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ) statement [32], with relevant items of PRISMA 2020 applied where they suit a qualitative design [33]. The review took an interpretive, constructivist stance, treating the findings of primary studies as data to be reinterpreted rather than facts to be pooled. The review protocol was not prospectively registered.

Eligibility criteria

Eligibility was defined using the SPIDER framework (Sample, Phenomenon of Interest, Design, Evaluation, Research type), which suits qualitative questions better than population and intervention frameworks. The criteria are set out in Table 1. In brief, qualitative studies and the qualitative strands of mixed methods studies were included if they reported the experiences of first year or preclinical medical students regarding academic stress, sleep, or both, and were published in English in peer reviewed journals from 2021 onward. Studies that recruited across years were included when first year or preclinical students formed part of the sample and the reported findings were not confined to clinical experience.

Table 1
Eligibility criteria structured by the SPIDER framework

SPIDER element	Inclusion criteria	Exclusion criteria
Sample	Undergraduate medical students (MBBS, MD or equivalent) in the first year or preclinical phase; mixed year samples when first year or preclinical students were included and findings were not confined to clinical experience	Postgraduate trainees and residents; samples drawn exclusively from clinical years; students of other health professions only
Phenomenon of interest	Experiences of academic stress, sleep (duration, quality, regularity, daytime tiredness, sleep management), or both	Studies addressing neither academic stress nor sleep; stress arising solely from clinical placement
Design	Interviews, focus groups, open text responses, or the qualitative strand of a mixed methods study reported separately	Purely quantitative designs; qualitative data not reported in a form that could be extracted
Evaluation	Perceptions, meanings, experiences, coping strategies and suggestions for change	Outcomes reported only as scale scores or prevalence
Research type	Qualitative or mixed methods primary studies published in English in peer reviewed journals from January 2021 onward	Reviews, editorials, protocols, conference abstracts, theses; publications before 2021; non English publications

SPIDER, Sample, Phenomenon of Interest, Design, Evaluation, Research type; MBBS, Bachelor of Medicine and Bachelor of Surgery.

Operational definitions

Academic stress referred to the strain students attributed to the demands of their course, including workload, assessment, performance expectations and the pace of learning. Sleep quality was understood broadly to include students' accounts of how long, how regularly and how restfully they slept, as well as daytime tiredness and the ways they managed their sleep. Accounts of general wellbeing were eligible when they referred to academic stress, sleep or both, because students rarely separate these experiences when they describe them.

Search approach

Searches were run through a general web search engine that retrieves records from open access databases and publisher platforms like PubMed and Google Scholar. Each search returned up to ten records, all of which were logged. Ten searches combined population terms (medical students, first year, preclinical, MBBS), phenomenon terms (academic stress, sleep, sleep quality, coping, wellbeing, transition) and design terms (qualitative, interviews, focus groups, thematic analysis). Seven strings also contained publication years, two contained the name of a journal and one contained country names, which was done to bring up specific clusters of studies but may have shaped retrieval. Terms were refined in successive rounds. Searching stopped after ten searches; the last two returned two and four new records out of ten each, so saturation cannot be assumed. The exact strings and the number of records returned by each search are reported in Additional file 1.

Selection process

All records returned by the searches were exported to a log and duplicates were removed. One reviewer screened the remaining records on title and abstract and then read potentially eligible reports in full against the criteria in Table 1. Reasons for exclusion at full text were recorded. Where more than one reason applied, a single primary reason was assigned in the order publication date, population, design (Additional file 1). The identification and selection process is summarised in Fig. 1.

Data collection process and data items

A structured form captured author, year, country, setting, participants and year of study, data collection method, analytic approach and study focus. Following Thomas and Harden [31], all text labelled as results or findings, including participant quotations and author interpretations, was extracted verbatim into a structured coding sheet by one reviewer.

Assessment of methodological quality

Each study was appraised with the Critical Appraisal Skills Programme (CASP) qualitative checklist [34], which addresses aims, design, recruitment, data collection, the researcher and participant relationship, ethics, analytic rigour, clarity of findings and value. The checklist's own response options are yes, no and cannot tell; a response of partly was added to record items that were reported incompletely. Appraisal was carried out by one reviewer and was not used to exclude studies. It informed the weight given to each study during synthesis, so that themes resting mainly on thinly reported studies were interpreted with caution. Confidence in the review findings was not formally graded with GRADE-CERQual.

Synthesis methods

Synthesis followed three stages [31]. First, extracted findings were coded line by line, staying close to the language of participants and authors. Second, codes were grouped into descriptive themes through constant comparison across studies, with attention to where accounts agreed and where they diverged. Third, the descriptive themes were interrogated against the review question to develop analytical themes that go beyond the content of the primary studies. Where studies included students from several years, priority was given to findings that authors attributed to first year or preclinical students or that were not tied to clinical placements. Theme development drew on the principles of reflexive thematic analysis [35, 36].

Reflexivity

The reviewer is a first year medical student. This position offered familiarity with the experiences described but also carried a risk of reading personal experience into the data. To manage this risk, the reviewer kept analytic memos and returned repeatedly to the original findings before settling on each theme.

Results

Study selection

The ten searches returned 95 records. After removal of 29 duplicates, 66 records were screened on title and abstract and 52 were excluded, most often because they reported quantitative surveys, concerned other student groups or did not address stress or sleep. Fourteen reports were assessed in full. Seven were excluded: three were published before 2021, two sampled only clinical year students (for example, Weyant-Cheeseman et al. [28]), one was a review rather than a primary study, and one analysed free text responses only quantitatively. Seven studies were included (Fig. 1; Additional file 1).

Characteristics of included studies

The seven studies were published between 2022 and 2026 and came from the United Kingdom [1], the United States [37–39], India [20], Brazil [30] and Malaysia [40], as summarised in Table 2. Together they

reported qualitative data from several hundred students, although the figures are not directly comparable: they mix interviewees, focus group participants and survey respondents, some participants in the Brazilian study took part in both phases, and the American open text data came from repeated annual surveys. Only one study sampled first year students exclusively [1], and its participants were students who had left or been required to withdraw. One study sampled second year preclinical students [40]; the remaining five recruited across years. Five studies collected data through individual interviews, two of them alongside surveys [20, 37]; one used online focus groups [30]; and one analysed open text survey responses gathered over four years of training [39]. Analytic approaches included framework analysis [1] and several forms of thematic analysis. Sleep was the main focus of two studies [20, 40] and a prominent finding in a third [30]. Two studies were conducted during or shortly after the COVID-19 pandemic and described its disruption directly [30, 38].

Table 2
Characteristics of the included studies

Study	Country and setting	Participants (year of study)	Data collection	Analysis	Focus
Picton et al. [1]	United Kingdom; one medical school	14 first year students who left or were required to withdraw	Unstructured exit interviews (face to face, telephone, email)	Framework analysis	Why students struggle in the first year
Chatterjee et al. [37]	United States; Mayo Clinic Alix School of Medicine, Arizona	First and second year students; interviews with about one fifth of eligible students	Year long survey at three time points and in person peer to peer interviews	Thematic analysis by independent raters	Conceptions of wellness and the wellness curriculum
Esguerra et al. [38]	United States; one medical school in New Mexico	27 first, second and third year students (24 at one year follow up)	Semistructured interviews at two time points	Thematic analysis	Happiness, stress and identity during pandemic disruption
Yogesh et al. [20]	India; tertiary teaching centre, Gujarat	20 interviewees (9 preclinical, 11 clinical) within a survey of 380	Semistructured interviews by Zoom or telephone, nested in a cross sectional survey	Inductive thematic analysis by two coders (NVivo 12)	Sleep, physical activity and their barriers
Felix et al. [30]	Brazil; private university, São Paulo	Students from first to sixth year; 200 in initial and 60 in follow up focus groups	Online focus groups in two phases	Thematic analysis by two coders with an auditor	Routines, sleep and mental health during isolation and after return to campus
Musick et al. [39]	United States; Virginia Tech Carilion School of Medicine	Open text responses from two classes surveyed in each of four years (120 surveys; 39 in first year)	Annual surveys with an open question asking students to list three stressors	Inductive thematic analysis by two independent coders	Stressors and coping across the four years of training

Study	Country and setting	Participants (year of study)	Data collection	Analysis	Focus
Karuppannan et al. [40]	Malaysia; one medical university	12 second year (preclinical) MBBS students	Semistructured interviews of 45 to 60 minutes	Thematic analysis (Braun and Clarke)	Sleep quality and academic performance

Studies are listed in order of publication. MBBS, Bachelor of Medicine and Bachelor of Surgery.

Methodological quality

Appraisal results are shown in Table 3. All studies stated clear aims and six of the seven used an appropriate qualitative methodology; the seventh [39] was rated as partly appropriate because its qualitative data were open text responses within a survey. The most common weakness was limited reporting of the relationship between researchers and participants, which was rated as cannot tell in five studies. Chatterjee et al. [37] used peer interviewers to encourage candour, a strength for sensitive topics. The analytic description in Karuppannan et al. [40] was brief, and just over half of the interviewees in Yogesh et al. [20] were clinical students, so their contribution to first year themes was weighted accordingly.

Table 3
Methodological quality of the included studies (CASP qualitative checklist)

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Picton et al. [1]	Y	Y	Y	P	P	CT	CT	Y	Y	Y
Chatterjee et al. [37]	Y	Y	Y	P	Y	Y	CT	Y	Y	Y
Esguerra et al. [38]	Y	Y	Y	P	Y	CT	CT	Y	Y	Y
Yogesh et al. [20]	Y	Y	Y	Y	Y	CT	Y	Y	P	Y
Felix et al. [30]	Y	Y	Y	P	Y	P	Y	Y	Y	Y
Karuppannan et al. [40]	Y	Y	Y	Y	Y	CT	Y	P	Y	P
Musick et al. [39]	Y	P	Y	P	P	CT	Y	Y	Y	Y

Q1, clear statement of aims; Q2, qualitative methodology appropriate; Q3, research design appropriate; Q4, recruitment strategy appropriate; Q5, data collected in a way that addressed the research issue; Q6, relationship between researcher and participants adequately considered; Q7, ethical issues taken into consideration; Q8, data analysis sufficiently rigorous; Q9, clear statement of findings; Q10, value of the research. Y, yes; P, partly; CT, cannot tell. Appraisal was carried out by one reviewer.

Themes

Thematic synthesis produced four analytical themes: entering a layered transition; sleep as the negotiable resource; a mind that will not switch off; and coping, culture and connection. Their relationship is summarised in Fig. 2.

Theme 1: entering a layered transition

Students did not describe academic stress as a single pressure. They described several changes arriving together. Among first year students who left or were required to withdraw from a medical school in the United Kingdom, the first year was experienced as a critical transition that demanded simultaneous adjustment to university life, to the medical course and to an emerging professional identity [1]. The authors grouped these students into six types, one of which was described as at capacity, and found that mental health problems and acute personal crises were the most common reasons for struggling, with early professional identity formation a hurdle in its own right. In a longitudinal American study, students traced their stress to a combination of individual circumstances, academic workload and events in the wider world, and described being challenged as individuals, as learners and as future professionals, which the authors linked to a risk of imposter feelings [38]. In a four year American study, first year students named adjusting to the style of medical school learning, block examinations, forming new social groups and separation from family as their main stressors [39]. Chatterjee et al. [37] found that academic performance sat at the centre of students' identity and wellbeing, yet academic work was also the largest barrier to wellness. The same instability appeared in accounts of timetables that changed so often that students were unsure when to rest [40]. Read together, these studies suggest that first year stress arises less from the volume of any single demand than from the effort of becoming several things at once, with little settled routine to fall back on. This theme drew on five studies and was the best supported of the four.

Theme 2: sleep as the negotiable resource

When time ran short, sleep was the first thing students gave up. Interviewees in the Indian mixed methods study described a workload that left little room for self care, and explained that although they knew sleep and exercise mattered, they sacrificed both to complete their coursework [20]. In Malaysia, late night study was described as a shared norm, with serious work often beginning only late in the evening. Sleeping earlier than peers carried a moral cost: “If you sleep early, you feel guilty” [40], p. 2970. Brazilian students described losses in time management that persisted after the return to campus, with commuting and procrastination eroding the hours available for study and rest [30]. American students expressed a clear preference for unstructured time over scheduled wellness activities, which suggests that the scarcest resource in their week was discretionary time rather than wellness content [37]. Across studies, sleep appeared as the only elastic block in a crowded day, a reserve to be drawn down whenever academic demands rose. The analytical point is that sleep loss was often described as a decision made under pressure, and in one study as shaped by peer norms, rather than as a symptom that simply happened to students. The peer norm element rests on a single, briefly reported study of twelve students and should be read as a hypothesis for testing.

Theme 3: a mind that will not switch off

Students also described lying awake because they could not stop thinking about their studies. Malaysian students reported that examination pressure kept them mentally revising questions even when they tried to sleep, and that the following day brought poor concentration, repeated rereading and heightened anxiety and irritability [40]. In the Brazilian focus groups, students described sleep that had become unregulated, alternating between insomnia and excessive sleep and often unrefreshing even when long, and poor sleep quality persisted after face to face teaching resumed [30]. The same students described a relentless internal standard: “Medicine demands a lot; I keep charging myself” [30]. Some students recognised the harm of poor sleep yet felt unable to change it, a sense of helplessness that Yogesh et al. [20] identified mainly among students facing rigid schedules. These findings point to a cycle. Academic worry delays and fragments sleep, poor sleep blunts concentration and emotional control, reduced efficiency demands longer study hours, and those hours are taken from sleep. The full cycle is the reviewer's interpretation across studies; individual studies described parts of it. Students tended to see the cycle as the normal price of medical training rather than as something that could be changed, although this was stated explicitly in only some accounts [30, 40].

Theme 4: coping, culture and connection

Students used a wide range of strategies, and many helped in the short term while adding to the problem later. Helpful practices included short afternoon naps and small group revision that reduced the need for all night study [40], as well as physical activity, new healthy routines, religious practice and closer family ties [30]. Less helpful strategies included heavy caffeine use to stay alert after late nights and evening screen use [40], along with increased alcohol and tobacco use during isolation [30]. In a four year American cohort, positive reframing was associated with lower perceived stress and venting with higher stress, and preclinical students described the strain of balancing academic demands with relationships and family [39]. Relationships emerged as the most consistent buffer. Esguerra et al. [38] described the primacy of personal and professional relationships in how students sustained their wellbeing, and Brazilian students credited peers and faculty for improvements after returning to campus [30]. Culture could also amplify strain. Peer norms that equated late nights with commitment reinforced poor sleep [40], and help seeking varied widely among first year students who were struggling [1]. Institutional offerings were judged by whether they addressed this culture. American students regarded mandatory wellness activities that left academic culture untouched with scepticism, and suggested restructuring academic work, integrating wellness into coursework and offering optional, individualised support [37]. The analytical insight is that the most effective buffers were relational and structural, whereas advice aimed only at individual habits competed with the same time pressure that caused the problem.

Line of argument

Taken together, the themes suggest that first year students experience academic stress and poor sleep not as two separate conditions but as one entangled process (Fig. 2). A layered transition compresses discretionary time; sleep becomes the negotiable reserve; worry carries into the night; and the resulting fatigue lowers efficiency, to which students respond with further sleep loss. Relationships, predictable assessment and trusted, flexible support may interrupt the cycle at several points. The model is an

interpretation developed by the reviewer from the four themes. The links between its stages were not tested in any single primary study.

Discussion

Principal findings

This synthesis of seven qualitative and mixed methods studies suggests that first year and preclinical medical students describe academic stress and poor sleep as a single, self reinforcing experience. Sleep was surrendered first when time ran short, late night study was described as a peer norm in one study, and worry about assessment followed students to bed. Relationships and flexible support were described as buffers, while individually focused or mandated wellness activities had limited reach. These findings rest on a small and uneven evidence base, described under strengths and limitations.

Comparison with existing research

The qualitative accounts are consistent with several quantitative patterns. The mediating role of anxiety and depression reported by Huang et al. [21] resonates with students' descriptions of a mind that would not switch off, which suggests that what disrupted sleep was not only a lack of time but persistent mental arousal at bedtime. The concentration of sleep loss in examination weeks, together with compensatory napping and weekend sleep [19], matches students' own accounts of naps and irregular routines. The rise in stress that Merrick et al. [3] attributed to frequent assessment and peer comparison fits the peer norm account in which rest acquired a moral meaning, although that account came from a single included study. The higher rates of insomnia in the early years reported by Alshehri et al. [18], and the tendency toward greater anxiety and depression in preclinical years observed by Lin et al. [10], are compatible with the layered transition that students described.

Viewed through the transactional model [23], the synthesis suggests a specific mechanism: early rest was appraised as a threat to standing among peers, which turned sleep into a cost rather than a resource. The coping reservoir described by West et al. [27] is depleted in a similar way when recovery activities are displaced, although the drivers in the first year appear to be assessment and identity rather than clinical duties. This distinction supports the view that each transition in medical education has its own character [28].

What this synthesis adds

The main contribution is a tentative account of sleep as socially and morally meaningful for early years students. Questionnaires such as sleep quality indices record how long and how well students sleep, but they cannot capture guilt about resting early, the sense that staying up signals commitment, or the belief that exhaustion is part of becoming a doctor. If these meanings are as widespread as one included study suggests, they may help to explain why sleep education alone often fails to change behaviour, and interventions that target knowledge without addressing shared norms may have limited effect. This

inference needs testing. Students were also not passive: they experimented with naps, group study and new routines and sought out relationships that helped them recover, so support that builds on these strategies may last longer than prescribed programmes.

Implications for medical education

Four tentative implications follow, each of which would need evaluation. First, sleep could be treated as a curricular issue rather than a private one. Brief, practical teaching on sleep and learning during orientation, designed with students and delivered by near peers, might challenge the belief that early rest signals weak commitment. Second, schools could review the rhythm of first year assessment and the stability of timetables, since sleep loss clusters around examinations [19] and unpredictable schedules disrupted routines [40]. Third, where structured support is offered, evidence from university students outside medicine favours targeted psychological approaches. Cognitive behavioural therapy for insomnia showed larger effects on sleep quality than mindfulness approaches [25], and a first year stress programme shifted stress mindset and coping when institutions supported it [24]. These are not findings of this synthesis. Fourth, support should be optional, flexible and relational. Students were sceptical of mandated wellness that left academic culture untouched [37], and relationships with peers, family and faculty were their most consistent protection [30, 38]. Monitoring should also reflect how students wish their wellbeing to be assessed [29]. Given that stress is common and often severe in many settings [4], these questions matter beyond well resourced institutions.

Strengths and limitations

Strengths include a transparent log of searches and eligibility decisions (Additional file 1), appraisal of every included study, and studies from five countries across four continents. Several limitations apply. The evidence base is small, and only one study sampled first year students exclusively; that sample consisted of students who had left or been required to withdraw and was not focused on sleep. Findings from studies that recruited across years could not always be separated by stage, and just over half of the interviewees in one study were clinical students. Sleep was a central aim in only two studies, so some themes rest on a limited number of detailed accounts. In particular, the peer norm account of sleep rests largely on one briefly reported study of twelve students [40]. One study supplied open text survey responses and reported part of its findings as associations with perceived stress scores [39]. Two studies were shaped by the pandemic, which may have amplified isolation and disrupted routines.

The search was limited to open access sources through a general web search engine that returns a ranked set of records for each query. No core bibliographic database was searched, some strings contained years, a journal name or country names that may have steered retrieval, and no separate search for earlier syntheses was run. Relevant studies may therefore have been missed. Screening, appraisal and coding were completed by one reviewer, no second reviewer checked these decisions, and the protocol was not registered, so interpretive bias and error cannot be excluded despite memo writing and repeated return to the source studies. Confidence in each theme was not graded with GRADE-CERQual and is conveyed only through the weighting of appraised studies. The restriction to English

language, peer reviewed publications may have excluded relevant work, and any synthesis depends on the depth of what primary authors chose to report. Most studies came from single institutions, which limits how far their accounts represent other curricula. Finally, the synthesis rests on the interpretation of a reviewer who is a first year student, a position that could shape theme development in either direction.

Recommendations for future research

Future studies should recruit first year students specifically and follow them across the academic year, combining interviews or sleep diaries with objective measures such as wearable devices. Research in low and middle income settings, where stress may be severe and support scarce, is particularly needed. Evaluations of changes to assessment timing, and of peer led sleep education, would show whether the cycle described here can be interrupted in practice. A repeat of this synthesis with searches of core bibliographic databases, two independent reviewers and formal grading of confidence would strengthen or revise the findings reported here.

Conclusions

In this limited evidence base, first year and preclinical medical students described academic stress and poor sleep as one intertwined problem. Faced with a layered transition, they treated sleep as the negotiable part of their day, and in one study this was reinforced by peer norms that equate late nights with dedication. Worry about assessment then followed them to bed, and the resulting fatigue lowered the efficiency of study, which pushed sleep further back. Students protected themselves best through relationships and through support that was flexible and trusted, while mandated activities that left academic culture unchanged achieved little. For medical schools, the findings suggest that student sleep is shaped by educational design. Pacing first year assessment, keeping timetables predictable, addressing late night study norms openly and offering evidence based sleep support could help new students build habits that protect both their learning and their health from the start of training. Because the evidence is small and the review used limited methods, these suggestions should be tested rather than assumed.

Abbreviations

CASP
Critical Appraisal Skills Programme
ENTREQ
Enhancing Transparency in Reporting the Synthesis of Qualitative Research
GRADE-CERQual
Grading of Recommendations Assessment, Development and Evaluation, Confidence in the Evidence from Reviews of Qualitative research
MBBS
Bachelor of Medicine and Bachelor of Surgery
PRISMA

Preferred Reporting Items for Systematic Reviews and Meta Analyses
SPIDER
Sample, Phenomenon of Interest, Design, Evaluation, Research type.

Declarations

Ethics approval and consent to participate

Ethical approval was not required as per the Data Protection Act 2018 (UK GDPR) which governs processing of personal data, because the original authors already secured consent and ethical approval, this study carries zero risk of harming primary participants. Since, this study is a qualitative evidence synthesis of previously published, publicly available studies no participants were recruited, no new data were collected from people, and no identifiable personal data were used, so the work did not involve human participants, human data or human tissue in the sense that requires review by an ethics committee or institutional review board. No ethics committee or institutional review board was approached, and none granted a waiver.

Consent for publication

Consent to participate was not applicable because there were no participants.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

R.A.C.M worked solely on this manuscript.

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Not applicable.

Data Availability

All data analysed in this review are drawn from the published studies cited, which are listed in the reference list and in Table 2. The search strings, records returned and full text eligibility decisions are included in this published article and its supplementary information files (Additional file 1), and the completed reporting checklists are in Additional file 2. The extraction sheets and coding framework generated during the review are available from the corresponding author on reasonable request.

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Figures

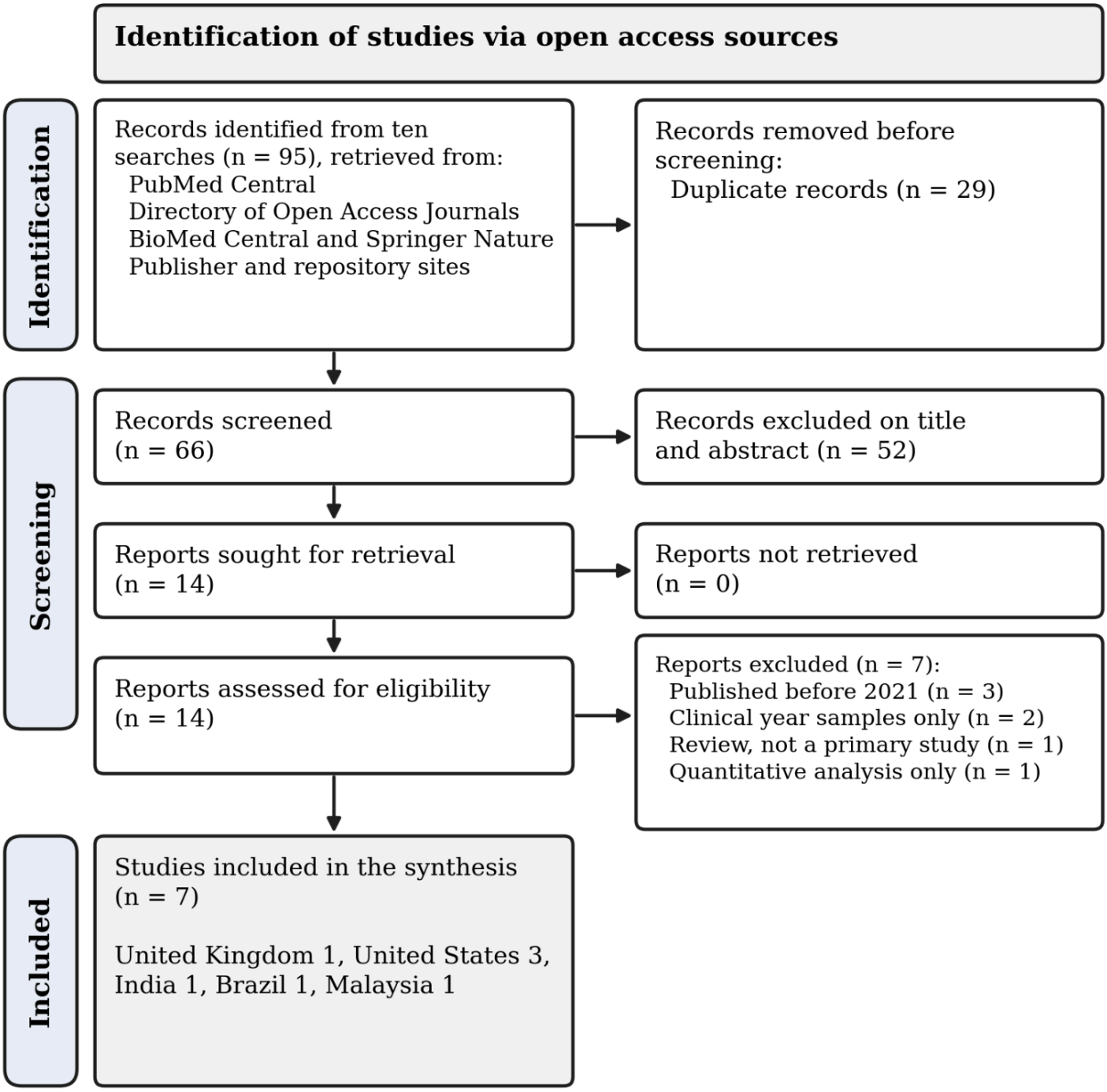


Figure 1

Flow diagram of study identification and selection. Adapted from the PRISMA 2020 flow diagram template [33]. The number of records returned by each search and the reason for each full text exclusion are given in Additional file 1.

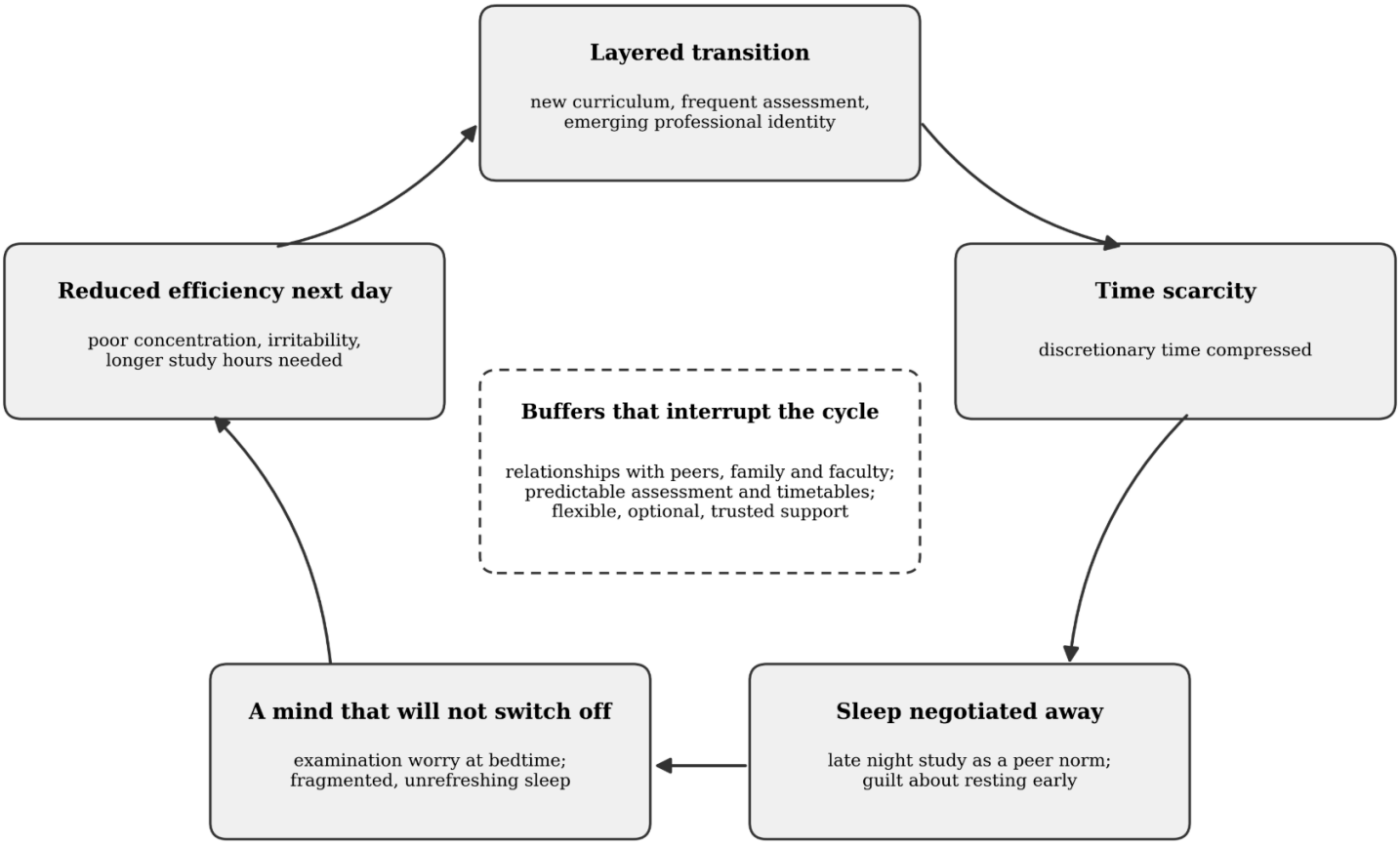


Figure 2

Line of argument model linking academic stress and sleep in first year medical students. Solid arrows show the self reinforcing cycle proposed from the four analytical themes. The dashed box shows buffers that students described as interrupting the cycle.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile1SearchLogandEligibilityRevised.docx
- Additionalfile2PRISMAENTREQChecklistsRevised.docx