

# Medical Students' Perceptions of the Learning Environment in South Asia: A Systematic Review of Quantitative Studies

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**Background:** Measuring students' perceptions of the learning environment has become widespread in medical education, with many benefits for both students and institutions. Despite its documented findings in small studies, there is a lack of systematic evidence on medical students' perceptions of the learning environment in South Asian countries.

**Objective:** This systematic review aimed to determine the perceptions of medical students of the learning environment in South Asia and to identify the factors that influence these perceptions.

**Methods:** We limited this systematic review to studies published between 2000 and 2024 which reported on medical students' perceptions of the learning environment in eight South Asian countries. Perceptions of the learning environment were assessed through self-rating scales in the included studies. Articles were retrieved from two electronic databases (PubMed and Scopus). In addition, we searched Google Scholar to identify relevant articles. This review was conducted in accordance with the PRISMA guidelines.

**Results:** Of 1191 identified articles, 15 studies fulfilled the pre-specified eligibility criteria and were included in the review. The Dundee Ready Education Environment Measure (DREEM) was the main instrument used in these studies. Of the 15 studies included, 13 studies reported a positive perception of the learning environment in South Asia. However, positive perception levels varied widely, reflecting disparities in learning environments across countries. Additionally, the influence of several factors (eg gender, education levels, and place of residence) on the perceptions of the learning environment was highlighted.

**Conclusion:** Results from this review suggest that medical students perceived the learning environment positively in most studies documented from the region. However, medical schools' learning environments in this region have a lot of room for growth and development to meet the standards set on a global scale. Moreover, the current state of the literature underscores the need for further research on the topic and on the best strategies to optimize the learning environment for medical education in South Asia.

**Keywords:** learning environment, educational environment, perceptions, medical education, South Asia

## Introduction

Over the past two decades, numerous policies and initiatives, such as curriculum reforms, faculty development programs, optimization of learning environments, the integration of technology-based learning, and accreditation systems, have been introduced to improve the quality of medical education in various contexts.<sup>1-5</sup> Several previous studies have highlighted the crucial role of the learning environment in medical education and how its contribution to the learning experience can lead to high-quality medical education.<sup>1-3</sup> The World Federation for Medical Education (WFME) also recognizes that the highest attainable standard of learning environment is a fundamental component of quality medical education.<sup>6</sup>

The medical school learning environment encompasses the physical, social, and psychological context that can shape students' learning experiences.<sup>2,7</sup> Previous studies have shown that the learning environment significantly influences students' academic performance, satisfaction, and attitude.<sup>8,9</sup> In recent years, students' perceptions of the learning environment have

been widely used to evaluate learning environments across countries.<sup>9</sup> There is also a well-established body of educational literature on the role of students' perceptions in enhancing learning environments and their effect on student learning.<sup>10,11</sup>

Over the past decades, several scales have been developed to assess learning environment perceptions from different stakeholders' perspectives.<sup>12</sup> Some of the most widely used scales in medical school settings are the Dundee Ready Education Environment Measure (DREEM), the Medical School Learning Environment Scale–Short Version (MSLES), the Johns Hopkins Learning Environment Scale (JHLES), and the Clinical Learning Environment Scale (CLES).<sup>12</sup> These self-assessment tools are designed to measure perceptions across multiple dimensions of the learning environment, such as teaching, learning, self-perception, physical atmosphere, student–teacher interaction, student–student interaction, patient–student interaction, and social perception.<sup>12</sup> However, there are marked variations among scales with respect to domains and interpretations.<sup>12,13</sup>

Published literature concerning students' perception of the learning environment in medical school settings has shown varying results. For instance, a systematic review of 40 studies in Saudi Arabia found that health professional students overall had a positive perception of their learning environment.<sup>14</sup> Similarly, a nationwide survey in Hungary found that medical and dental students had a more positive than negative perception of the learning environment, suggesting an overall satisfaction with the learning environment.<sup>15</sup> Other educational literature from different countries has highlighted the varying degrees of satisfaction with the learning environment among medical students.<sup>1,8,9,16–18</sup> Furthermore, a number of factors (eg gender, education levels, academic performance, and funding source for education) that could potentially influence students' perception of the learning environment have been documented.<sup>1,14,16–18</sup>

There is evidence that assessing the learning environment has the potential benefit of improving the quality of medical education.<sup>9,19,20</sup> This is of particular importance in countries where substandard medical education is commonplace. For example, South Asian nations (India, Sri Lanka, Afghanistan, Pakistan, Bangladesh, Nepal, Bhutan, and the Maldives) could consider these learning environment initiatives to improve the quality of medical education.<sup>21</sup> A growing body of literature shows that the burden of several diseases is exceptionally high in this region.<sup>22,23</sup> Moreover, limited capacity and insufficient numbers of medical doctors have been identified as other health sector challenges in these settings.<sup>24</sup> A critical factor contributing to these poor health outcomes is the state of medical education and training, which directly affects healthcare service delivery, workforce competency, and access to quality care.<sup>21,25</sup> Taken together, these points emphasize the importance of enhancing the quality of medical education in South Asian countries. As an example, poor-quality medical education has necessitated the exploration of learning environment initiatives as a potential solution, particularly in resource-limited settings.<sup>2</sup>

Several studies have examined medical students' perceptions of their learning environment in South Asia.<sup>26–30</sup> However, a comprehensive systematic review focusing on these perceptions is lacking. Therefore, our systematic review aimed to determine the perceptions of medical students of their learning environment in South Asian medical schools and identify the factors influencing these perceptions. These findings will inform the development of region-specific medical education policies to enhance students' learning experiences in these settings. Further, this review will also highlight key areas for future research.

## Methods

This systematic review was reported according to the “Preferred Reporting Items for Systematic review and Meta-Analysis” (PRISMA) guidelines, and has been registered on PROSPERO (CRD42023461971).<sup>31</sup>

## Data Sources and Search Strategy

English-language studies were searched in electronic databases (PubMed and Scopus). Articles published earlier than 2000 did not match the inclusion criteria (as most learning environment scales were developed from 2000 onwards). To report on a broader scope of available information, we extended the search until December 2024. In addition, we searched Google Scholar to identify relevant articles.

In this search, the key words consisted of “Perception”, “learning environment”, and “educational environment”, for the outcome; “medical student”, “resident”, and “medical undergraduate”, for the population, and “Afghanistan”, “Bangladesh”,

“Bhutan”, “India”, “Maldives”, “Nepal”, “Pakistan”, “Sri Lanka”, and “South Asia”, for the location. These terms were used in all searches with the appropriate truncations and Boolean operators (such as AND and OR) (see [S1B](#)).

## Inclusion and Exclusion Criteria

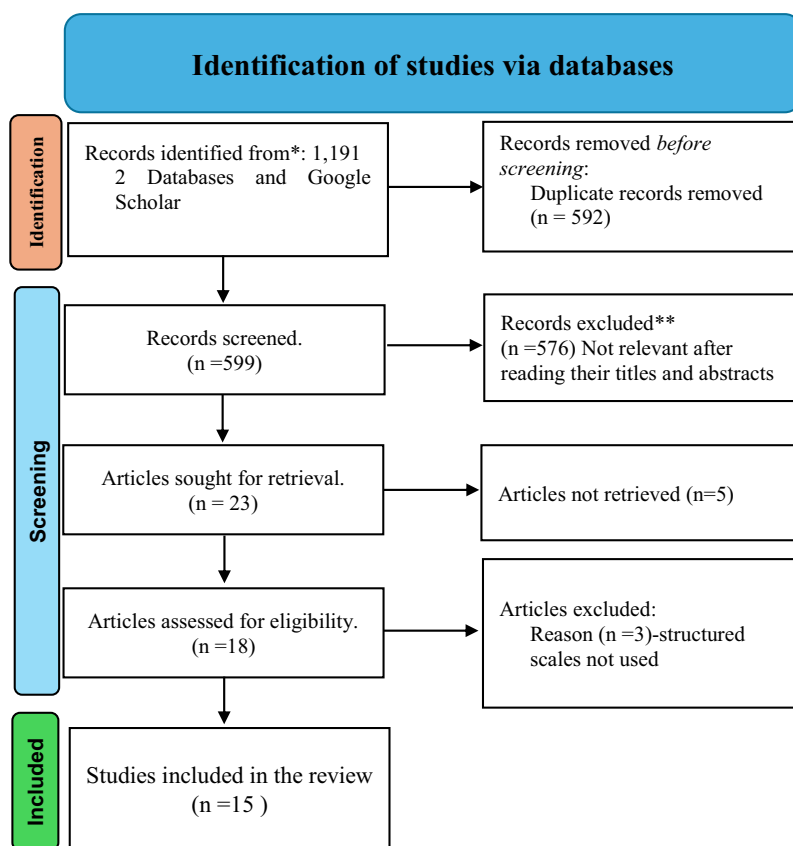
Our eligibility criteria were: (1) publication type: original research, (2) study design: quantitative studies utilizing self-ratings measures to assess medical students’ perceptions of the learning environment, (3) population: medical students (4) location: studies conducted in South Asia, (5) language: English (facilitate comprehension and analysis), and (6) published between 2000 and December, 2024. We excluded articles that (1) were case reports and case series, (2) focused on a single domain of the learning environment, and (3) assessed perceptions of the virtual (online) learning environment.

## Screening and Selection

Our total identified records were 1191. Initially, 592 duplicate records were removed. Second, at the title and abstract screening level, we excluded 576 more records due to our ineligibility criteria. Furthermore, 5 studies were excluded for either assessing only a single domain of the learning environment or not utilizing a structured scale to measure perceptions, leaving 18 pertinent studies for full review. Following a thorough examination of the records, we noticed that 3 studies did not match our inclusion criteria. Finally, we selected all the remaining 15 articles to be reviewed ([Figure 1](#)).

## Data Extraction

Two reviewers (M.H.S and S.S) extracted data on the publication year, country setting, institution name, phases of medical education, sample size, measurement scale, and outcomes reported. The primary outcome was the perception of learning environment measured by a self-rating scale. Secondary outcomes were the perceptions regarding learning environment dimensions and factors influencing medical students’ perceptions of the learning environment in general (see [S1A](#)).



**Figure 1** A PRISMA flow diagram of the article's selection procedure.

## Quality Assessment

At the initial data extraction phase, all studies were found to be cross-sectional in design. Therefore, the methodological quality of the reviewed studies was evaluated by the Joanna Briggs Institute (JBI) checklist for cross-sectional studies.<sup>32</sup> This consists of 8 items to assess the quality of cross-sectional research related to study design, measurements, and statistical analysis. All studies were rated by two senior researchers (M.H.S and H.S) on the JBI checklist. Discrepancies were solved by team discussion. The details of the JBI checklist for grading cross-sectional studies are summarized in [S2](#).

## Data Analysis and Data Synthesis

Due to the heterogeneity in the included studies in terms of medical education phases and measures of learning environment perception, a meta-analysis was not conducted. Therefore, the key findings of each included study were narratively summarized in Tables, which included publication year, country setting, institution name, medical education phase, sample size, measures, and key results.

## Results

### Characteristics of the Included Studies

[Table 1](#) summarizes the characteristics of the included studies. Of the 15 studies included in this review, 6 were conducted in India,<sup>16,33–36</sup> five in Pakistan,<sup>17,18,26,28–30,37</sup> two in Sri Lanka,<sup>26,29</sup> and there was one each in Nepal,<sup>38</sup> and Bangladesh.<sup>39</sup> We found no studies from Bhutan, Afghanistan, and Maldives. The majority of the studies (10 articles;

**Table 1** Descriptive Summary of the Studies Assessing the Perceptions of Medical Students of Their Learning Environment in South Asia (n=15)

Authors and Publication Year	Country	Institution Name	Medical Education Phase	Sample Size (Male, Female)	Scale
Ellawala et al (2021) <sup>26</sup>	Sri Lanka	University of Sri Jayewardenepura	Pre-clinical, para-clinical, and clinical	595 (2;3)	DREEM
Shah et al (2019) <sup>38</sup>	Nepal	Chitwan Medical College	Medical students (4 <sup>th</sup> and 5 <sup>th</sup> years)	103 (66;37)	DREEM
Azim et al (2024) <sup>37</sup>	Pakistan	Liaquat Medical College	Medical students at orthopedic posting	205 (103;102)	HEMLEM
Bannur et al (2024) <sup>35</sup>	India	Prathima Institute of Medical Sciences	Medical students (1 <sup>st</sup> -final years and interns)	212 (63;149)	DREEM
Algotar et al (2024) <sup>33</sup>	India	C. U. Shah Medical College	Medical students (all semesters)	348 (NA)	DREEM
Zuberi et al (2024) <sup>30</sup>	Pakistan	Dow University	Medical students (all semesters)	632 (173/459)	DREEM
Wijesinghe et al (2023) <sup>29</sup>	Sri Lanka	Four medical schools	Medical students (at surgical clinical rotations)	390 (158/227)	Mini-STEEM
Chellaiyan et al (2023) <sup>36</sup>	India	Two medical schools	Medical students (all semesters)	594 (224/370)	DREEM
Tufai al (2021) <sup>28</sup>	Pakistan	Combined Military Hospital Lahore Medical College	Final year medical students (at obstetrics rotation)	88 (26/60)	DREEM
Khan et al (2021) <sup>18</sup>	Pakistan	Ayub Medical College Abbottabad	Medical students (at curriculum transition)	149 (66/83)	DREEM

(Continued)

Table 1 (Continued).

Authors and Publication Year	Country	Institution Name	Medical Education Phase	Sample Size (Male, Female)	Scale
Amaranathan et al (2018) <sup>34</sup>	India	Jawaharlal Institute	Medical students (all semesters)	452 (244;208)	DREEM
Sengupta et al (2017) <sup>40</sup>	India	Nil Ratan Sircar Medical College and College of Medicine and Sagore Dutta Hospital	Medical students (all semesters)	278 (178;100)	DREEM/JHLES
Abraham et al(2008) <sup>16</sup>	India	Melaka Manipal Medical College	Medical students (first year and clinical phase)	226 (114;97)	DREEM
Jawaid et al (2013) <sup>17</sup>	Pakistan	Dow University	Medical students (at curriculum transition)	586 (123/463)	DREEM
Nahar et al(2011) <sup>39</sup>	Bangladesh	15 medical schools	Medical students (3 <sup>rd</sup> , 4 <sup>th</sup> , 5 <sup>th</sup> years)	1903 (940/963)	DREEM

**Abbreviations:** DREEM, Dundee Ready Educational Environment Measure; HEMLEM, Healthcare Education Micro-Learning Environment Measure; mini-STEEM, Mini Surgical Theatre Educational Environment Measure; JHLES, Johns Hopkins Learning Environment Scale; NA, Not Available.

66%) were conducted on medical students' learning environment in general. The remaining 5 (34%) studies included medical students at diverse phases of their education, such as curricula transition phase (2; 13%), clinical rotation phase (2; 13%), and clinical posting (1; 8%). The latter perceptions were often evaluated in a specific context. While the sample size of the studies varied greatly, it ranged from 100 to 300 in the majority of the papers (65%).

Most of the included studies utilized the DREEM scale to assess medical students' perceptions of their learning environment.<sup>30,38,39</sup> However, one study by Azim et al used the Healthcare Education Micro-Learning Environment Measure (HEMLEM),<sup>37</sup> as well as another study, which was conducted by Wijesinghe et al, used the mini Surgical Theatre Educational Environment Measure (mini-STEEM).<sup>29</sup> For a comparative assessment, however, some scales, such as the DREEM and JHLES, were used together (Table 1).<sup>40</sup>

## Medical Students' Perceptions of the Learning Environment

Our systematic review included 15 studies, thirteen of which used the DREEM scale to measure medical students' perceptions of the learning environment in South Asia.<sup>16,17,28,30,38-40</sup> The overall DREEM score obtained in these studies varied greatly, ranging from 91.8 to 127.4 (possible range 0-200). Based on the DREEM scoring rubric,<sup>41</sup> several studies indicated that medical students had a positive perception of their learning environment. Zuberi et al and Chellaiyan et al observed a total score of 91.8 and 100.1, respectively.<sup>30,36</sup> This implies that medical students in these settings perceived their learning environment as having many problems. In contrast, Tufail et al, found a total score in the range of 126-127.<sup>28</sup> This was an extremely favorable score, indicating that medical students had an optimistic view of the learning environment.

Table 2 illustrates the comparison of students' perceptions across different dimensions of learning environment. Several reviewed articles indicate that certain dimensions of the learning environment were rated less favorable by students. For instance, social self-perception and atmosphere were the lowest rated dimensions in almost all reviewed studies.<sup>11,21,28-30,38</sup> On the other hand, the majority of studies found a positive perceptions toward teaching and learning dimensions (details in Table 2).<sup>11,21,28-30,38</sup>

Azim et al and Wijesinghe et al employed different instruments to assess medical students' perceptions of the learning environment. Azim et al used the HEMLEM scale, which includes 12 items in two dimensions (teaching quality and staff attitude).<sup>37</sup> The mean scores for teaching quality and staff attitude were above 50%. On the other hand, the surgical clinical rotation, which was assessed by mini-STEEM, was found satisfactory.<sup>29</sup> Additionally, the JHLES and DREEM,

**Table 2** Total and Subscales Scores, Interpretation, and Secondary Findings of Studies Using DREEM Scale to Assess Medical Students' Perceptions of the Learning Environment in South Asia (n=13)

Authors and Publication Year	Learning (48)*	Teaching (44)*	Academic Self-Perception (32)*	Atmosphere (48)*	Social Self-Perception (28)*	Total (200)*	Interpretation**	Secondary Findings
Ellawala et al (2021) <sup>26</sup>	31.1	27.5	16.9	29	20	124	More positive than negative	Highest score: Pre-clinical students (P < 0.05). Lowest score: Para-clinical students.
Shah et al (2019) <sup>38</sup>	29.8	25.9	20.3	28.6	17.2	122	More positive than negative	No significant differences were observed.
Bannur et al (2024) <sup>35</sup>	27.6	26.3	20.4	25.1	13.4	112.6	More positive than negative	-
Algotar et al (2024) <sup>33</sup>	40.3	27.8	20.6	30.3	15.2	124.5	More positive than negative	-
Zuberi et al (2024) <sup>30</sup>	23.1	23.4	16.1	24.4	13.4	100.01	Many problems	-
Chellaiyan et al (2023) <sup>36</sup>	14.2	20.2	12.5	22.9	12.1	91.8	Many problems	Higher scores were found in fourth year students and interns (P < 0.001).
Tufai et al (2021) <sup>28</sup> Pre-training	30.7	30.5	19.8	27.8	17.7	126.6	More positive than negative	Final year students perceived their learning environment as more positive (P < 0.001). Clinical rotation improved learning environment perceptions (P, 0.010).
Tufai et al (2021) <sup>28</sup> Post-training	30.9	30.5	19.9	28.5	17.7	127.4	More positive than negative	
Khan et al (2021) <sup>18</sup>	26.0	23.7	19.3	26.8	15.8	111.6	More positive than negative	Influencing factors: Gender (P, 0.042) and place of residence.
Amaranathan et al (2018) <sup>34</sup>	29.1	27.0	19.1	30.0	16.9	122.1	More positive than negative	Pre-clinical students scored better than clinical students (P < 0.001).
Sengupta et al (2017) <sup>40</sup>	28.1	30.4	19.7	27.4	14.4	119.6	More positive than negative	-
Abraham et al (2008) <sup>16</sup>	28.1	28.3	18.5	29	15.5	116.3	More positive than negative	First year students scored better than final year students (P < 0.001).
Jawaid et al (2013) <sup>17</sup>	25.8	25.4	18.8	28.0	16.3	114.4	More positive than negative	-
Nahar et al (2011) <sup>39</sup>	27.8	24.3	19.5	24.3	14.3	110.4	More positive than negative	Female students scored better than male students (P < 0.001).

**Note:** \*Maximum score. \*\*According to the instrument grading rubric, a DREEM total score of >100 is considered significant for meeting the satisfactory (positive) learning environment standard.

**Table 3** Key Findings of Studies Using Scales Other Than DREEM to Assess Medical Students' Perception of the Learning Environment in South Asia (n=3)

Authors and Publication Year	Scale	Key Findings
Azim et al (2024) <sup>37</sup>	HEMLEM	Predominantly positive view of the orthopedic ward's: >50%. Male and fourth year students had positive view.
Sengupta et al (2017) <sup>40</sup>	JHLES and DREEM	Total score: 86/140 (satisfactory) Peers (16.7/30), faculty (23.8/30), academy (22.1/25), engagement (10.1/20), mentorship (5.6/10), inclusion and safety (6.4/15), physical space (5.2/10).
Wijesinghe et al (2023) <sup>29</sup>	Mini-STEEM	Learning environment: satisfactory - Good surgical experience: 88% - Friendly atmosphere: 94% - Discrimination: <10%

**Abbreviations:** HEMLEM, Healthcare Education Micro-Learning Environment Measure; mini-STEEM, Mini Surgical Theatre Educational Environment Measure; JHLES, Johns Hopkins Learning Environment Scale.

which were employed together in an Indian medical school, observed no significant difference.<sup>40</sup> Key findings of studies using HEMLEM, mini-STEEM, and JHLES are summarized in Table 3.

## Factors Influencing Medical Students' Perceptions of the Learning Environment

Due mostly to the diversity of the medical school settings, there are a couple of factors that play a crucial role in influencing students' perceptions of the learning environment.

Three studies reported the gender of students as a possible influencing factor on their perceptions. For instance, studies done in Pakistan and Bangladesh have reported a more satisfactory perception of female students than male students.<sup>18,39</sup> However, Azim et al reported a more positive perception of the learning environment among male students at an orthopedic ward posting in Pakistan.<sup>37</sup>

Some studies (6/15; 40%) show a significant association between students' perceptions of the learning environment and education levels, particularly between the first and final year students. Three of these studies reported a favorable view among first (pre-clinical) year students,<sup>16,26,34</sup> while three others reported a more positive perception among final-year students.<sup>28,36,37</sup>

In addition, residential area was identified as a factor influencing medical students' perceptions in Pakistan.<sup>18</sup> Students from rural areas were reported to have a more positive perception of the learning environment.

## Discussion

This review aims to examine and summarize the existing credible literature on measuring medical students' perceptions of the learning environment in South Asia. We found that medical students positively perceived the learning environment in most of the studies documented in South Asia. However, positive perception levels varied widely, reflecting disparities in learning environment perceptions among medical students across countries. Moreover, we observed that several factors (eg gender, education levels, and place of residence) were reported to influence medical students' perceptions of the learning environment in the documented studies.

Several scales are available for measuring perceptions of the learning environment in health professional education. However, only four scales were reported in the current review. The DREEM was the most common scale used (13/15), followed by HEMLEM (1/15), mini-STEEM (1/15), and JHLES (1/15). This finding signifies that learning environment research, in particular, has not received the attention it calls for over the past two decades in South Asia. Therefore, the validation and use of various learning environment measures are potential areas for future research in these settings.

This review indicates that the majority of studies (86%) reported a positive perception of the learning environment. Of the 13 studies that used the DREEM scale, eleven studies specifically reported a positive perception of the learning environment, with total scores ranging from 110.4 to 127.4 (possible range 0–200).<sup>28,29,38–40</sup> According to the instrument grading rubric,<sup>41</sup> a DREEM total score of >100 is considered significant for meeting the satisfactory (positive) learning

environment standard. Although these studies indicated a positive perception, the reported DREEM scores were lower compared to some studies conducted in other countries. The DREEM total scores were found to be 137 and 145 in studies conducted in Australia,<sup>42</sup> and the UK,<sup>43</sup> respectively. Given these findings, medical schools' learning environments in South Asia have a lot of room for growth and development to meet the standards set on global grounds.

This review also observed differences in perception levels across dimensions of learning environments. The DREEM scale measures perceptions in teaching, learning, academic self-perceptions, atmosphere, and social self-perceptions (possible maximum scores shown in Table 2). We found that atmosphere and social self-perceptions were less positive perceived dimensions in most studies.<sup>11,21,28–30,38</sup> Several other studies have also reported significant differences in learning environment dimensions.<sup>9,14</sup> The lowest positively perceived dimensions—atmosphere and social self-perceptions—in the South Asian context may, to some extent, reflect the socioeconomic challenges students in these regions encounter. Extending this narrative, several studies have reported infrastructural constraints in South Asian medical schools.<sup>4,21,44,45</sup> Moreover, mental health symptoms among medical students in these settings are widely documented.<sup>46,47</sup> As a policy measure, it is imperative to assess the overall learning environment and address multiple dimensions when designing educational interventions and programs.

This review also revealed that learning environments can be examined in specific contexts. For instance, Azim et al used a self-structured scale (HEMLEM) to assess students' perceptions of an orthopedic learning environment in Pakistan.<sup>37</sup> Similarly, Wijesinghe et al used mini-STEEM to evaluate students' perceptions of clinical rotation phases.<sup>29</sup> Both studies reported a relatively satisfactory experience in the mentioned environments. Additionally, a study conducted at an Indian University used two scales (DREEM and JHLES) to assess medical students' perceptions of the learning environment and reported a positive experience in both scales.<sup>40</sup> These findings emphasize the significance of various scales that can be utilized in medical school learning environments.

We also observed that studies reported a significant influence of only a limited number of factors on medical students' perceptions of their learning environment in South Asia. These factors included gender, education level, and place of residence. As such, studies conducted in other developing countries have found the influence of several factors in determining the perceptions of medical students of their learning environment. For instance, a study conducted in an Iranian medical science university also found that gender and education levels (academic years) were strongly associated with students' perceptions of the learning environment.<sup>9</sup> Other factors, such as accommodation type, financing source for education, and year of enrollment, were found to be critical determinants of learning environment perceptions.<sup>2,8,14</sup> These associations may highlight cultural and contextual influences. Nevertheless, studies that explore factors influencing learning environment experience, eg gender, residence, education levels, accommodation, and financing source for education, epitomize only a subset of factors related to learning environment perceptions. Therefore, future studies should consider a wide range of internal and external factors when examining the elements that influence learning environment perceptions and experiences. Understanding these factors may provide significant evidence for shaping educational policies and programs to optimize a particular learning environment.

## Recommendations and Implications for Future Research

The current state of the literature on the learning environment in medical schools in South Asia warrants concern and action. To improve the learning environment in medical schools in this region, the following measures are recommended. First, develop and validate scales to measure students' perception of the learning environment at different phases of medical education. Second, the development of context-specific scales in conflict-affected countries (eg Afghanistan) is highly recommended to have an understanding of the context-specific findings, address the specific problems, and highlight the strength of the particular learning environment. Finally, designing and implementing programs aimed at enhancing the learning environment is mandatory to improve the overall quality of medical education in these settings.

## Limitations

This systematic review does have its limitations. First, limiting the review to quantitative studies reduces the generalizability of the overall findings. Second, the use of various measures and dimensions in perception assessment makes cross-study comparisons challenging. Third, the exclusion of dimensions of learning environments, such as optimistic

bias, as search terms. Nonetheless, even studies that examined one dimension of the learning environment perception can add value to the overall perception of the learning environment. Fourth, according to the JBI results, several studies lacked information about sampling strategy and accounting for confounders. Finally, the review is limited by the number of included studies (n=15) and the lack of studies from Afghanistan, Bhutan, and the Maldives, which affects the generalizability of the findings.

## Conclusion

This review provides systematic evidence, for the first time to our knowledge, about learning environment research in medical schools across South Asian countries. Findings from this review indicated that the learning environment was perceived positively by medical students in the majority of studies documented from the region. However, the medical school learning environment in this region has a lot of room for growth and development to meet the standards set on a global scale. Moreover, the limited data on the medical school learning environment research in the area calls for additional research, ideally in the form of evaluating various phases of medical education through validated scales as well as the influence of several factors on the medical school learning environment. With a better understanding of learning environment perceptions and influencing factors, interventions and programs can be developed or enhanced accordingly.

## Data Sharing Statement

All data generated in this systematic review are included in this published article and its supporting information files.

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