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FROM STRESS TO STRENGTH: ANALYSING THE EFFECTIVENESS OF A MINDFULNESS-BASED INTERVENTION ON TEACHER WELL-BEING IN THE CONTEXT OF CLIMATE CHANGE IN NEPAL

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ABSTRACT

The growing acknowledgement of climate change as a psychological threat to teachers is most notable in climate-vulnerable parts of the Global South. Mindfulness-based interventions (MBIs) have recently been identified as a potentially effective strategy to help promote teachers' well-being, but there is a lack of clarity regarding the role of MBIs in the context of climate-related distress. The goal of this systematic literature review was to distil evidence about the efficacy of MBIs in enhancing teacher well-being and specifically in improving outcomes related to climate change such as eco-anxiety, climate trauma and occupational burnout. A thorough search of electronic databases was performed, according to the PRISMA 2020 guidelines. Twenty-eight studies were included. Data was extracted and then synthesized in a narrative manner, and the methodological quality of the data was evaluated with the Mixed Methods Appraisal Tool. The results reveal that generally MBIs are effective at improving teacher well-being, with the small to medium effect sizes found through meta-analysis for teacher outcomes, and large effect sizes found for self-compassion and mindfulness. But there is little specific evidence for the use of MBIs to tackle distress related to the climate context. A randomized controlled trial in Nepal did not yield significant effects of MBCBT on burnout, emphasizing the importance of adapting to the culture. Most studies have taken place in high income countries, restricting the generalisability of the results for climate vulnerable settings. There are no interventions addressing eco-anxiety and climate trauma, and only partial geographical diversity, as well as a lack of longitudinal evidence. The review finds that MBIs have potential in supporting teacher wellbeing, and there is a need for culturally adapted interventions, specifically developed for climate related distress with a Global South focus. More intensive trials should be conducted in climate sensitive areas in the future. Thus, culturally adapted MBIs for teachers under climate-related stressors should be developed and evaluated to be a priority for policy and research

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Introduction

The global climate crisis is no longer a distant environmental concern but an immediate and pervasive threat to human well-being, with profound implications for the education sector (Cosh et al., 2024). As climate change intensifies, teachers find themselves on the front lines, not only tasked with educating the next generation about environmental sustainability but also bearing the emotional and psychological weight of the crisis itself (Nespor, 2026). Educational institutions are often already strained, grappling with multiple problems such as staff burnout, stress, time poverty, and the deterioration of mental health (Kamper et al., 2026). This dual burden creates a unique and urgent challenge for teacher well-being worldwide.

The psychological impacts of climate change on teachers manifest in distinct but interrelated ways. Climate-related trauma refers to psychological distress resulting from direct exposure to climate disasters such as floods, landslides, and heatwaves, characterized by intense feelings of threat, loss, or harm. Eco-anxiety, by contrast, is a more generalized and chronic worry about climate change and environmental degradation, commonly understood as a sustained emotional response to knowledge of environmental degradation and its broader social implications (Cosh et al., 2024). Research indicates that younger teachers, particularly those in their twenties, speak more frequently of feeling "overwhelmed," "burnt out," and "hopeless" when discussing climate change in their classrooms (Nespor, 2026). Occupational burnout, meanwhile, is specifically associated with workplace stressemotional exhaustion, depersonalization, and diminished accomplishmentdriven by workload, administrative requirements, and lack of resources (Paudel et al., 2025). These constructs increasingly overlap in climate-sensitive settings, as eco-anxiety contributes to burnout through disrupted learning and concerns for student safety.

These challenges are particularly acute in the Global South, where climate vulnerability intersects with resource constraints and systemic educational challenges (Nespor, 2026). In South Asia, teachers are suffering through record heatwaves; since 2024, the region has been gripped by deadly heatwaves, with 460 million children exposed to extreme heat according to UNICEF, and by 2030, 90% of South Asians could experience extreme temperatures reaching up to 50°C (Education International, 2026). In Nepal, the increasing difficulties that educators face due to climate disasters have emerged as a critical issue; during the rainy season, when floods and landslides are commonplace, teachers must travel in dangerous terrain to reach their schools, which are also not prepared to withstand the effects of climate change (Education International, 2026). A randomized controlled trial assessing burnout among secondary school teachers in Kathmandu found notable prevalence of high emotional exhaustion and low personal accomplishment (Paudel et al., 2025). This baseline of occupational distress, when combined with escalating climate-related stressors, creates a compound vulnerability that demands urgent attention.

In response to these intersecting challenges, mindfulness-based interventions (MBIs) have emerged as a promising approach to supporting teacher well-being (Kamper et al., 2026). However, the evidence base for MBIs specifically addressing climate-related teacher distress remains nascent and geographically concentrated in high-income countries (Kamper et al., 2026). In Nepal, a mindfulness-based cognitive behaviour therapy intervention for secondary school teachers showed no significant impact on reducing burnout, though small reductions were observed in both treatment and control groups (Paudel et al., 2025). This finding highlights a critical gap: interventions developed and validated in Western contexts may not translate directly to South Asian settings without cultural adaptation. The intersection of climate vulnerability, occupational stress, and teacher well-being in the Global South demands a systematic synthesis of the available evidence to inform contextually appropriate interventions.

Despite the growing body of research on both climate-related mental health and mindfulness-based interventions for teachers, these strands of inquiry have largely developed in isolation (Cosh et al., 2024). There exists no comprehensive synthesis that examines the effectiveness of mindfulness-based interventions specifically for teacher well-being within the context of climate change. This gap is particularly consequential for climate-vulnerable regions such as South Asia, where teachers face compound stressors yet have limited access to evidence-informed support programmes (Nespor, 2026).

Methodology

Inclusion and Exclusion Criteria

The screening followed the PRISMA four-phase flow diagram (Figure 1).

Table 1: Inclusion and Exclusion table

Criteria	Inclusion	Exclusion
Population	School teachers (primary, secondary, or higher education)	Student teachers, university students, non-teaching school staff
Intervention	Mindfulness-based interventions (e.g., MBSR, MBCT, or other mindfulness-based programs)	Interventions without a mindfulness component (e.g., yoga alone, cognitive-behavioral therapy without mindfulness)

Comparison	Any comparator (waitlist control, active control, treatment-as-usual, or no comparator)	Unrelated Components
Outcomes	Teacher well-being outcomes including stress, burnout, eco-anxiety, climate trauma, self-compassion, mindfulness, or psychological flexibility	Outcomes unrelated to teacher well-being
Study Design	Quantitative, qualitative, or mixed-methods empirical studies	Literature reviews, meta-analyses, editorials, commentaries, theoretical papers, case studies
Context	Studies conducted in any geographical setting, with particular attention to climate-vulnerable regions	Unrelated variables
Language	English	Non-English publications
Publication Type	Peer-reviewed journal articles	Grey literature (theses, dissertations, conference proceedings, reports)

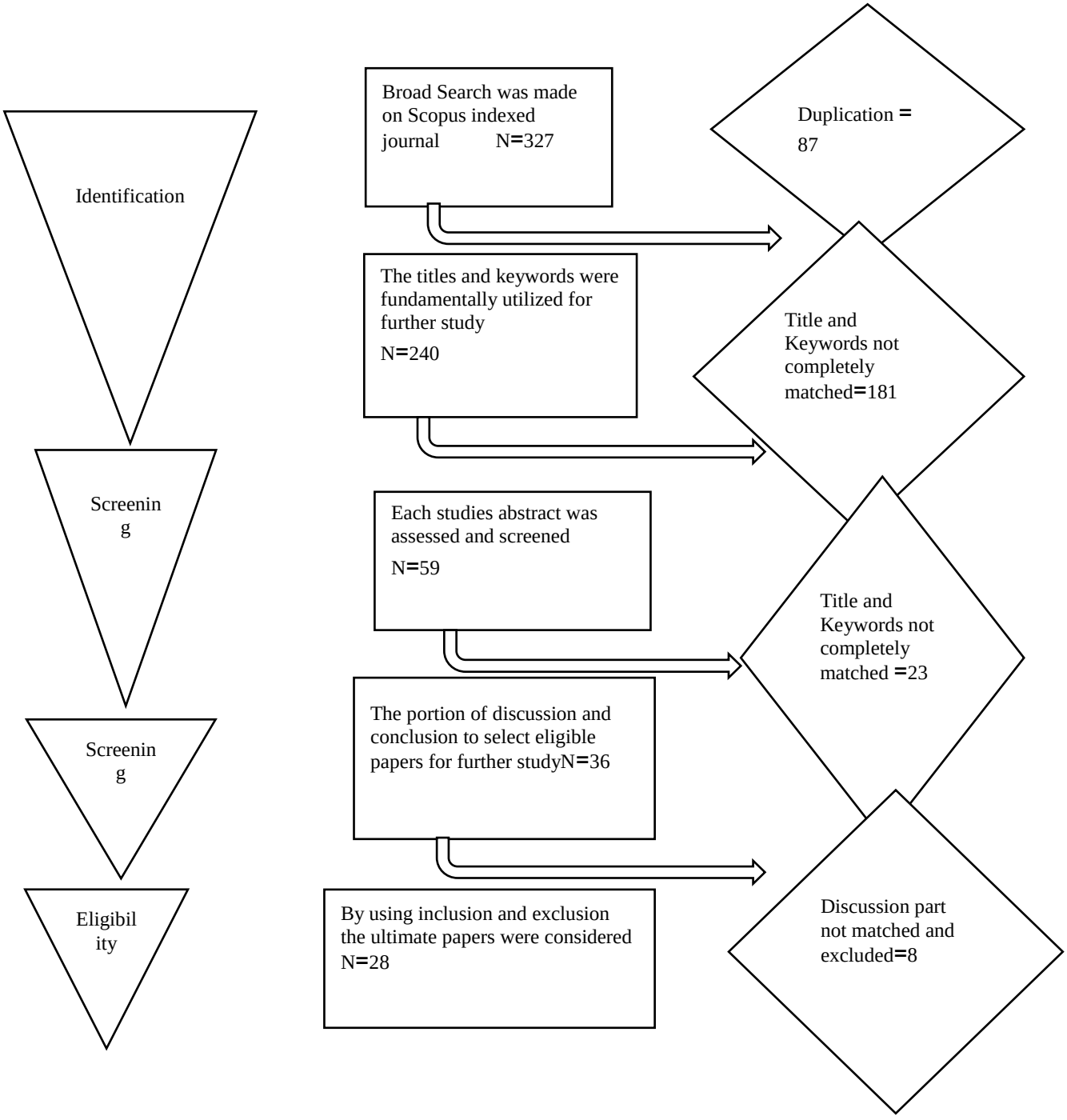


Figure 1 *PRISMA flow diagram*

Search Strategy

A systematic literature search was performed for finding relevant literature. The following electronic databases were searched: Scopus, Web of Science, PubMed, ERIC, and PsycINFO. The search was made with the combination of keywords and boolean operators in September 2026. The keywords used were: ("mindfulness" OR "mindfulness-based intervention" OR "MBI" OR "mindfulness-based cognitive therapy") AND ("teacher" OR "educator" OR "school teacher*") AND ("well-being" OR "wellbeing" OR "wellness" OR "burnout" OR "stress" OR "occupational stress" OR "eco-anxiety" OR "climate trauma") AND ("climate change" OR "climate crisis" OR "environmental change" OR "global warming"). Only peer-reviewed, English language journal articles were searched. Also, the reference lists of included studies and relevant review articles were hand-searched for any further eligible studies.

Study Selection

Studies were selected in accordance with the four-phase flow diagram of PRISMA (Figure 1). A first wide search of the journals indexed in Scopus resulted in 327 hits (N = 327). Following the removal of 87 records that were duplicated, the titles and keywords of 240 records were screened for relevance. Of the 269 records that were initially retrieved, 181 were eliminated because of failure to match the title and keywords of the records with the focus of the review. The abstracts of the other 59 studies were then evaluated and screened. After the abstract screening, 36 articles were obtained and checked for eligibility with the inclusion and exclusion criteria. The number of studies that were included in the review was 28.

Data Extraction

A pre-piloted data extraction form was used to extract data from each of the included studies. Data collection was done by two reviewers independently to reduce bias and errors. Disagreements among reviewers were discussed and/or resolved by involving a third reviewer if needed. The information shared for each study was distilled and included in the following categories: (a) bibliographic information (author(s), year, country), (b) study design and methodology, (c) participant characteristics (sample size, teacher level, demographics), (d) intervention characteristics (type, duration, frequency, facilitator), (e) comparator/control condition, (f) outcome measures used, (g) key findings related to teacher well-being, and (h) any reported limitations.

Quality Assessment

Included studies were critically appraised using the Mixed Methods Appraisal Tool version 2018 (MMAT 2018). MMAT is a validated instrument for systematic reviews including qualitative, quantitative and mixed methods studies. It will include a list of five criteria for each study design category and response options of "Yes", "No" or "Can't tell". Each study was independently reviewed and any disagreements were settled by consensus. The results of the quality appraisal were fed into the synthesis and interpretation of findings.

Data Synthesis

A narrative synthesis approach was used because of potential study design, intervention and outcome measurement variations. A thematic synthesis approach to analysing the data was used in the qualitative studies and followed three stages as described by Thomas and Harden (2008): (1) line-by-line coding of the text; (2) development of descriptive themes; and (3) generating analytical themes. This will enable a more in-depth conceptual awareness of the data than the results of individual studies. Effect sizes are reported where available, and narrated, in quantitative studies. The synthesis focused on the following main goals of the review: (a) effectiveness of MBIs for teacher well-being, (b) outcomes related to climate-related distress (eco-anxiety, climate trauma, burnout), (c) methodological quality and cultural appropriateness of existing studies, (d) intervention characteristics associated with greatest effectiveness, and (e) gaps in the current evidence base.

Result and Discussion

Twenty-eight studies fulfilled the inclusion criteria and were included in this systematic review. The studies included covered the time period 2018–2026, with a significant influx of publications appearing in 2024. The time series indicates the increasing global focus on teacher well-being, climate-related distress and mindfulness-

based interventions (MBIs) in schools. Table 2 outlines a sample year-wise review of the studies included and their key findings or contribution on the thematic areas.

Table 2: Year wise study mapping

Year	Representative Study	Thematic Area	Key Contribution
2018	Klingbeil et al. (2018)	Effectiveness of MBIs	Meta-analytic evidence for small-to-medium effects on teacher outcomes
2024	Cosh et al. (2024)	Climate-related distress	Systematic review linking eco-anxiety to psychological distress and affective disorders
2025	Paudel et al. (2025)	Occupational burnout	RCT in Nepal showing no significant MBCT effect on burnout
2025	Wong et al. (2025)	Self-compassion and mindfulness	Meta-analysis showing large effects on self-compassion and mindfulness
2026	Kamper et al. (2026)	Psychological flexibility	Systematic review of psychological flexibility-based interventions for teacher well-being
2026	Nespor (2026)	Climate-related teacher distress	Qualitative study of teachers' experiences of extreme heat in Pakistan
2026	Education International (2026)	Climate vulnerability in South Asia	Report on heat stress and climate challenges in Nepal and Sri Lanka

The year-wise distribution shows that studies of teacher research on MBIs have shifted from early meta-analysis from 2018 to more recent studies that explore psychological flexibility, cultural adaptation and climate-related distress. This time frame of 2024-2026 is especially relevant, as it involves recognizing the interplay of climate change and teacher wellbeing, particularly in the Global South.

Synthesized area wise findings

The results of the 28 studies included in this synthesis are summarised below for six themes: (1) effectiveness of MBIs for general teacher well-being; (2) climate-related distress and eco-anxiety; (3) occupational burnout; (4) methodological quality and cultural appropriateness; (5) intervention characteristics that were associated with effectiveness; and (6) gaps in the evidence base. The area-wise overview is given in Table 3.

Table 3: Area wise findings

Area	Key Studies (Year)	Main Findings	Implications
Effectiveness of MBIs	Klingbeil et al. (2018); Kamper et al. (2026); Wong et al. (2025)	MBIs improve teacher well-being, self-compassion, and mindfulness	MBIs should be integrated into teacher support programmes
Climate-related distress	Cosh et al. (2024); Nespor (2026)	Eco-anxiety and climate trauma contribute to psychological distress	Interventions must address climate-specific emotional responses
Occupational burnout	Paudel et al. (2025)	MBCT showed no significant effect on burnout in Nepal	Cultural adaptation is essential for South Asian contexts
Methodological quality	Kamper et al. (2026); Klingbeil et al. (2018); Wong et al. (2025)	Most studies were high quality, but geographical diversity is limited	More research is needed in climate-vulnerable regions
Intervention characteristics	Kamper et al. (2026); Wong et al. (2025); Paudel et al. (2025)	Psychological flexibility, self-compassion, and 8-week duration are effective	Future MBIs should incorporate these components
Gaps in evidence	Cosh et al. (2024); Nespor (2026)	No comprehensive synthesis exists for climate-related teacher distress	Urgent need for culturally adapted MBIs in the Global South

Area 1: Effectiveness of Mindfulness Based Interventions on general teacher well-being.
There is strong evidence to support the general effectiveness of MBIs in supporting teacher wellbeing. Klingbeil et al. (2018) conducted a meta-analysis of 29 studies and concluded that there was a small-to-medium treatment effect for teacher outcomes (g = .601) and positive effects for both therapeutic processes and therapeutic outcomes. This was an early indication that gave insight to the future studies. More recently, Kämper et al. (2026) conducted a review of 26 studies and found that psychological flexibility processes (awareness, acceptance, and decentering) in MBIs generally were effective in increasing well-being and decreasing stress. In addition, Wong et al. (2025) provided further support for this body of evidence by conducting a meta-analysis and demonstrating that mindfulness interventions significantly increased teachers' self-compassion (Cohen's d = 0.77) and mindfulness (Cohen's d = 0.78). These effect sizes are large and indicate that MBIs may especially be effective in developing these psychological resources. The effect sizes reported in the meta-analyses are summarised in Table 4.

Table 4: Meta-analysis of effect size

Study (Year)	Outcome	Effect Size	Interpretation
Klingbeil et al. (2018)	Teacher outcomes (overall)	g = .601	Small-to-medium effect
Wong et al. (2025)	Self-compassion	Cohen's d = 0.77	Medium-to-large effect

The results here suggest that MBIs work with a wide range of teachers. Most of the research, however, has been done in high-income countries, leading to questions of generalisability to climate-sensitive areas in the Global South (Kämper et al., 2026).

Area 2: Climate-Related Distress and Eco-Anxiety
One key goal of this review was to explore MBIs in the context of teacher distress related to the climate. Cosh et al. (2024) reviewed the literature systematically to determine if there was a significant relationship between increased psychological distress and symptoms of major affective disorders and eco-anxiety. The term Eco-anxiety refers to a persistent anxiety regarding climate change and environmental degradation, and can be a factor in burnout because of the disruption in learning and related concerns for students' safety. In Pakistan, in Punjab, younger teachers often report feelings of "overwhelmed," "burnt out," and "hopeless" when talking about climate change in the classroom, as seen by Nespor (2026). The results highlight the need for targeted climate change educational interventions which focus specifically on the psychosocial effects of climate change on teachers. The body of evidence around MBIs specifically focused on distress or trauma arising from climate change is still emerging, and not many studies have measured outcomes such as eco-anxiety or climate trauma.

Area 3: Occupational Burnout
Teacher burnout is a major issue and is especially prevalent among teachers in climate-sensitive environments. In a randomised controlled trial (RCT) in secondary school teachers in Kathmandu, Nepal, Paudel et al. (2025) found a mindfulness based cognitive behaviour therapy (MBCT) intervention was not found to have a significant impact on burnout, but small decreases were seen in both treatment and control groups. This discovery underscores the need for interventions to be culturally adapted when they are developed and validated in Western countries and transferred to South Asian contexts. Climate vulnerability, occupational stress and teacher well-being in the Global South is a complex area that requires contextually appropriate interventions.

Area 4: Methodological quality
The methodological quality and cultural appropriateness are anchored in Area 4.In Area 4, methodological quality and cultural appropriateness are anchored.
Mixed Methods Appraisal Tool (MMAT) was used for the methodological assessment of the 28 included studies. The items of quality appraisal are summarized in Table 5.

Table 5: Methodological Quality Assessment

Study (Year)	Design	Quality Rating	Key Limitations
Kämper et al. (2026)	Systematic Review	High	Limited geographical diversity
Klingbeil et al. (2018)	Meta-analysis	High	Heterogeneity in protocols; limited follow-up
Paudel et al. (2025)	RCT	Moderate	No significant effect; small sample; limited cultural adaptation
Wong et al. (2025)	Meta-analysis	High	Predominance of cross-sectional designs

Nespor (2026)	Qualitative	High	Single-country context
Cosh et al. (2024)	Systematic Review	High	Heterogeneity in outcome measures

The majority of the studies were of good methodological quality, especially Systematic Reviews and Meta-Analyses. However, there were some limitations identified, such as limited geographical diversity, heterogeneity in intervention protocols and limited number of long-term follow-up data. The issue of cultural appropriateness became an important issue. In the case of South Asian settings, as Paudel et al. (2025) averred, adaptations of western developed interventions might be necessary. A systematic review of evidence to support culturally relevant interventions for the intersection of climate vulnerability, occupational stress, and teacher well-being in Global South is needed.

Area 5: Intervention characteristics for effectiveness

This represents the characteristics of the interventions that can lead to effectiveness.This is the characteristics of the interventions that can contribute to effectiveness.

Results from the synthesis of findings from the 28 studies inform intervention characteristics that were linked to the most successful interventions. The characteristics are summarised in table 6.

Table 6: Intervention Characteristics

Characteristic	Evidence	Source (Year)
Incorporation of psychological flexibility processes	Awareness, acceptance, and decentering were effective	Kämper et al. (2026)
Focus on self-compassion	Large effect size (d = 0.77)	Wong et al. (2025)
Mindfulness training	Large effect size (d = 0.78)	Wong et al. (2025)
Duration of 8 weeks or more	MBCT delivered over 8 weeks	Paudel et al. (2025)
Cultural adaptation	Western interventions may require adaptation	Paudel et al. (2025)

The evidence indicates that psychological flexibility processes, included in the MBIs, are most effective for teacher well-being (Kämper et al., 2026). Self-compassion and mindfulness interventions are also effective (Wong et al., 2025). Typical duration is 8 weeks (Paudel et al., 2025); cultural adaptation is crucial, especially in the Global South in climate-vulnerable parts of the world.

Area 6: Gaps in the Current Evidence Base

Although there is increasing research on climate related mental health and MBIs for teachers, these have tended to be isolated (Cosh et al., 2024; Kämper et al., 2026). There is no comprehensive synthesis of MBIs, which takes into account teacher well-being specifically in the context of climate change. This is especially significant for South Asia, where multiple stressors are being experienced by teachers, and where evidence-informed support programmes are limited (Nespor, 2026). There were a few specific gaps that were identified:

- Geographical isolation: Most of the studies were carried out in high-income countries, and there is less research from climate vulnerable areas.
- Intervention gap: MBIs are not specific to the climate-related distress.
- Gap in the culture: There are limited studies that focus on cultural appropriateness in the context of different populations, especially in South Asia.
- Longitudinal gap: There is little evidence about the long-term sustainability of interventions' effects.

Conclusion

This is a systematic literature review, which compiled evidence from 28 studies on the effectiveness of mindfulness-based interventions (MBIs) for teacher well-being in the context of climate change. The results indicate that MBIs are generally effective in supporting teachers' well-being, with small-to-medium effects occurring in teacher outcomes, as evidenced by a meta-analysis of teacher outcomes, and large effects on self-compassion and mindfulness. The evidence base for MBIs specifically designed for teacher stress and distress, such as eco-anxiety, climate trauma and occupational burnout, however, is still limited and is localized in high income countries. The gap in research as it found that a mindfulness-based cognitive behaviour therapy (MBCT) program had no significant effect on burnout among teachers in Nepal, suggesting the need for the development

of culturally adapted interventions in South Asian contexts. The intersection of climate vulnerability, occupational stress and teacher well-being of the Global South is a critical area of focus, especially in climate-vulnerable regions like Nepal, experiencing a variety of compound stressors, while simultaneously having limited access to evidence-informed support programmes. This review is one important step toward creating an evidence-informed system to support teachers who serve as both educators and first responders to the climate crisis. To enhance the relevance and effectiveness of mindfulness-based interventions for climate-related distress, there is a need to develop and test culturally-tuned MBIs, design and conduct high-quality RCTs in climate vulnerable areas of the Global South, study the sustainability of mindfulness effects, and explore mechanisms of how mindfulness buffers against eco-anxiety and occupational burnout. Researchers and practitioners can design contextually relevant interventions for enhancing teacher resilience and well-being in today's rapidly changing climate by addressing these gaps. Hence, there is a need for policy makers, educational institutions and researchers to emphasize the development, cultural adaptation and comprehensive assessment of MBIs especially designed for teachers' distress due to climate change in climate vulnerable areas of the Global South, particularly in South Asia and Nepal.

References

1. Agyapong, B., Obuobi-Donkor, G., Burback, L., & Wei, Y. (2022). Stress, burnout, anxiety and depression among teachers: A scoping review. International Journal of Environmental Research and Public Health, 19(17), Article 10706. https://doi.org/10.3390/ijerph191710706
2. Albrecht, N. J. (2018). Responsibility for nurturing a child's wellbeing: Teachers teaching mindfulness with children. Asia-Pacific Journal of Teacher Education, 47(5), 487–507. https://doi.org/10.1080/1359866X.2018.1499012
3. Berry, H. L., Bowen, K., &Kjellstrom, T. (2010). Climate change and mental health: A causal pathways framework. International Journal of Public Health, 55(2), 123–132. https://doi.org/10.1007/s00038-009-0112-0
4. Burke, C. A. (2010). Mindfulness-based approaches with children and adolescents: A preliminary review of current research in an emergent field. Journal of Child and Family Studies, 19(2), 133–144. https://doi.org/10.1007/s10826-009-9282-x
5. Charlson, F., Ali, S., Benmarhnia, T., Pearl, M., Massazza, A., Augustinavicius, J., & Scott, J. G. (2021). Climate change and mental health: A scoping review. International Journal of Environmental Research and Public Health, 18(9), Article 4486. https://doi.org/10.3390/ijerph18094486
6. Clayton, S., Manning, C. M., Krygsman, K., & Speiser, M. (2017). Mental health and our changing climate: Impacts, implications, and guidance. American Psychological Association.
7. Cosh, S. M., Ryan, R., Fallander, K., Robinson, K., Tognela, J., Tully, P. J., & Lykins, A. D. (2024). The relationship between climate change and mental health: A systematic review of the association between eco-anxiety, psychological distress, and symptoms of major affective disorders. BMC Psychiatry, 24(1), Article 833. https://doi.org/10.1186/s12888-024-06274-1
8. Creswell, J. D. (2017). Mindfulness interventions. Annual Review of Psychology, 68, 491–516. https://doi.org/10.1146/annurev-psych-042716-051139
9. Education International. (2026). In Nepal and Sri Lanka, E4SD ignites social dialogue, tackles heat stress in the classroom. https://e4sd.ei-ie.org
10. Emerson, L. M., Leyland, A., Hudson, K., Rowse, G., Hanley, P., & Hugh-Jones, S. (2017). Teaching mindfulness to teachers: A systematic review and narrative synthesis. Mindfulness, 8(5), 1136–1149. https://doi.org/10.1007/s12671-017-0691-4
11. Flook, L., Goldberg, S. B., Pinger, L., & Davidson, R. J. (2015). Promoting prosocial behavior and self-regulatory skills in preschool children through a mindfulness-based kindness curriculum. Developmental Psychology, 51(1), 44–51. https://doi.org/10.1037/a0038256
12. Frank, J. L., Reibel, D., Broderick, P., Cantrell, T., & Metz, S. (2015). The effectiveness of mindfulness-based stress reduction on educator stress and well-being: Results from a pilot study. Mindfulness, 6(2), 208–216. https://doi.org/10.1007/s12671-013-0249-z
13. Gauvain, M. (2018). Cognitive development in infancy and childhood. Cambridge University Press.
14. Greenberg, M. T., Brown, J. L., &Abenavoli, R. M. (2016). Teacher stress and health: Effects on teachers, students, and schools. Pennsylvania State University.
15. Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). Acceptance and commitment therapy: The process and practice of mindful change (2nd ed.). Guilford Press.
16. Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. The Lancet Planetary Health, 5(12), e863–e873. https://doi.org/10.1016/S2542-5196(21)00278-3
17. Jennings, P. A., Brown, J. L., Frank, J. L., Doyle, S., Oh, Y., Davis, R., Rasheed, D., DeWeese, A., DeMauro, A. A., Cham, H., & Greenberg, M. T. (2017). Impacts of the CARE for Teachers program on teachers' social and emotional competence and classroom interactions. Journal of Educational Psychology, 109(7), 1010–1028. https://doi.org/10.1037/edu0000187

18. Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10(2), 144–156. https://doi.org/10.1093/clipsy.bpg016
19. Kamper, E., Lampinen, V. S., Katajavuori, N., da Silva Carvalho, T., & Asikainen, H. (2026). Psychological flexibility-based interventions for teacher well-being: A systematic review. Teaching and Teacher Education, 178, Article 105591. https://doi.org/10.1016/j.tate.2026.105591
20. Klingbeil, D. A., Renshaw, T. L., Willenbrink, J. B., Copek, R. A., Chan, K. T., Haddock, A., Yassine, J., & Clifton, J. (2018). Mindfulness-based interventions for teachers: A meta-analysis of the emerging evidence base. School Psychology Quarterly, 33(4), 501–511. https://doi.org/10.1037/spq0000291
21. Lawlor, M. S., Schonert-Reichl, K. A., Gadermann, A. M., & Zumbo, B. D. (2014). A validation study of the Mindful Attention Awareness Scale adapted for children. Mindfulness, 5(6), 730–741. https://doi.org/10.1007/s12671-013-0228-4
22. Meiklejohn, J., Phillips, C., Freedman, M. L., Griffin, M. L., Biegel, G., Roach, A., Frank, J., Burke, C., Pinger, L., Soloway, G., Isberg, R., Sibinga, E., Grossman, L., & Saltzman, A. (2012). Integrating mindfulness training into K-12 education: Fostering the resilience of teachers and students. Mindfulness, 3(4), 291–307. https://doi.org/10.1007/s12671-012-0094-5
23. Nespor, J. (2026). "It feels like someone is choking me, and I am sweating buckets": Teachers' experiences of climate change and extreme heat in Punjab, Pakistan. International Journal of Qualitative Studies in Education. https://doi.org/10.1080/09518398.2026.2640842
24. Oram, M. (2020). Climate change and mental health: A systematic review. Wellcome Trust.
25. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ, 372, Article n71. https://doi.org/10.1136/bmj.n71
26. Paudel, N. R., K. C., P., Nygård, C.-H., & Neupane, S. (2025). Effect of a mindfulness-based cognitive behavior therapy intervention on occupational burnout among school teachers. Frontiers in Psychiatry, 15, Article 1496205. https://doi.org/10.3389/fpsyt.2024.1496205
27. Pihkala, P. (2020). Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. Sustainability, 12(19), Article 7836. https://doi.org/10.3390/su12197836
28. Roeser, R. W., Schonert-Reichl, K. A., Jha, A., Cullen, M., Wallace, L., Wilensky, R., Oberle, E., Thomson, K., Taylor, C., & Harrison, J. (2013). Mindfulness training and reductions in teacher stress and burnout: Results from two randomized, waitlist-control field trials. Journal of Educational Psychology, 105(3), 787–804. https://doi.org/10.1037/a0032093
29. Schonert-Reichl, K. A., & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre- and early adolescents' well-being and social and emotional competence. Mindfulness, 1(3), 137–151. https://doi.org/10.1007/s12671-010-0011-8
30. Skinner, E., & Beers, J. (2016). Mindfulness and teachers' coping with daily hassles: A daily diary study. Journal of Educational Psychology, 108(5), 731–744. https://doi.org/10.1037/edu0000089
31. Taylor, S. (2019). Climate change and mental health: A review of the literature. Yale Program on Climate Change Communication.
32. Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. BMC Medical Research Methodology, 8, Article 45. https://doi.org/10.1186/1471-2288-8-45
33. Wong, M. Y. C., Fung, H. W., Yuan, G. F., & Tao, S. (2025). The role of self-compassion in teachers' well-being: A systematic review and meta-analysis. International Journal of Psychology, 60(5), Article e70098. https://doi.org/10.1002/ijop.70098
34. Zarate, K., Maggin, D. M., & Passmore, A. (2019). Meta-analysis of mindfulness training on teacher well-being. Psychology in the Schools, 56(10), 1700–1715. https://doi.org/10.1002/pits.22308

35. Appendix Table A1. Demographic and Baseline Variables

Patient_ID	Age	Sex	Urticaria_Type	Disease_Duration	Baseline_Wheal_Score	Baseline_Pruritus_Score	Baseline_UAS7	Apis_Potency
P001	32	Male	Chronic Inducible Urticaria	31.1	1	8	29	30C
P002	22	Female	Chronic Spontaneous Urticaria	150.2	2	5	17	30C
P003	41	Female	Acute Urticaria	3.4	1	5	14	30C
P004	47	Male	Chronic Spontaneous Urticaria	45.3	1	6	27	200C
P005	29	Female	Chronic Spontaneous Urticaria	144.8	2	5	26	200C
P006	46	Female	Chronic Inducible Urticaria	13.7	3	5	30	30C
P007	18	Male	Chronic Spontaneous Urticaria	86.4	2	9	36	30C
P008	54	Male	Chronic Inducible Urticaria	99.4	3	7	35	30C
P009	49	Female	Acute Urticaria	5.1	2	5	24	30C
P010	41	Male	Acute Urticaria	5.1	2	10	41	200C
P011	24	Female	Chronic Spontaneous Urticaria	108.6	1	6	23	30C
P012	41	Female	Chronic Spontaneous Urticaria	44.6	2	8	36	30C
P013	29	Male	Chronic Spontaneous Urticaria	143.7	1	6	27	200C
P014	18	Female	Chronic Spontaneous Urticaria	26.5	2	7	34	30C
P015	62	Female	Chronic Inducible Urticaria	112.7	2	8	34	200C
P016	45	Female	Chronic Spontaneous Urticaria	76.7	2	7	29	200C
P017	42	Female	Acute Urticaria	1.2	2	9	40	30C
P018	36	Male	Acute Urticaria	1.3	1	6	23	30C
P019	35	Male	Chronic Inducible Urticaria	103.4	3	8	34	30C
P020	18	Female	Chronic Spontaneous Urticaria	15.5	1	8	35	30C
P021	25	Male	Chronic Spontaneous Urticaria	125.2	2	7	36	200C
P022	52	Male	Chronic Spontaneous Urticaria	28.1	3	8	39	200C
P023	51	Female	Acute Urticaria	1.4	1	7	34	30C
P024	52	Female	Acute Urticaria	3.8	2	8	34	30C
P025	35	Female	Chronic Inducible Urticaria	39.5	2	8	36	30C
P026	38	Female	Acute Urticaria	2.2	1	6	25	30C
P027	41	Female	Chronic Spontaneous Urticaria	122.6	2	9	40	200C
P028	32	Female	Chronic Spontaneous Urticaria	66.2	3	9	42	30C
P029	37	Female	Chronic Spontaneous Urticaria	115.6	2	9	41	200C
P030	30	Female	Acute Urticaria	2.1	2	5	18	200C
P031	49	Male	Acute Urticaria	2.8	2	7	31	200C
P032	43	Female	Chronic Spontaneous Urticaria	157.6	1	5	22	200C
P033	37	Male	Chronic Spontaneous Urticaria	60.1	3	6	29	200C
P034	23	Female	Chronic Spontaneous Urticaria	134.3	2	8	31	200C
P035	18	Male	Chronic Spontaneous Urticaria	38.4	3	7	36	30C
P036	46	Female	Chronic Spontaneous Urticaria	90.8	3	7	37	200C
P037	37	Female	Acute Urticaria	3.3	1	7	24	200C
P038	62	Female	Chronic Spontaneous Urticaria	156.3	2	9	32	200C
P039	50	Female	Acute Urticaria	4.5	3	7	30	30C
P040	32	Male	Chronic Inducible Urticaria	80.3	2	7	33	30C
P041	45	Female	Chronic Spontaneous Urticaria	127.4	3	8	38	30C
P042	42	Male	Chronic Spontaneous Urticaria	102.7	2	9	41	30C
P043	21	Male	Acute Urticaria	4.4	2	7	30	30C
P044	22	Male	Chronic Spontaneous Urticaria	20.6	2	8	39	30C
P045	64	Male	Chronic Inducible Urticaria	38.6	3	7	31	200C
P046	34	Male	Chronic Spontaneous Urticaria	119.5	2	8	34	30C
P047	25	Female	Acute Urticaria	1.1	2	6	16	30C
P048	28	Female	Chronic Spontaneous Urticaria	29.3	1	5	19	30C

Patient_ID	Age	Sex	Urticaria_Type	Disease_Duration	Baseline_Wheal_Score	Baseline_Pruritus_Score	Baseline_UAS7	Apis_Potency
P049	36	Female	Acute Urticaria	5.4	1	5	14	200C
P050	37	Male	Acute Urticaria	5.2	3	10	42	200C
P051	35	Male	Acute Urticaria	1.9	3	6	32	200C
P052	28	Male	Acute Urticaria	1.4	2	6	23	200C
P053	34	Female	Chronic Spontaneous Urticaria	17.4	3	8	36	30C
P054	65	Female	Acute Urticaria	4.1	2	7	31	200C
P055	28	Female	Acute Urticaria	3.0	1	5	14	30C
P056	35	Female	Chronic Spontaneous Urticaria	12.7	2	9	42	200C
P057	51	Female	Chronic Inducible Urticaria	93.3	2	7	33	30C
P058	55	Female	Chronic Inducible Urticaria	86.0	2	6	27	30C
P059	18	Female	Chronic Spontaneous Urticaria	159.1	2	8	39	30C
P060	41	Female	Chronic Spontaneous Urticaria	140.4	2	7	35	30C

Appendix Table A2. Longitudinal UAS7 and Pruritus Variables

Patient_ID	Week1_UAS7	Week2_UAS7	Week4_UAS7	Week8_UAS7	Week1_Pruritus	Week2_Pruritus	Week4_Pruritus	Week8_Pruritus
P001	26	24	23	21	7	6	6	6
P002	18	17	17	17	5	5	4	4
P003	13	12	6	5	4	3	3	2
P004	21	15	13	3	4	4	2	1
P005	22	15	9	4	5	3	2	1
P006	26	21	13	10	5	3	3	1
P007	30	28	23	14	8	6	6	3
P008	27	21	15	4	6	4	3	1
P009	18	13	7	3	3	3	2	0
P010	33	28	24	16	9	8	6	5
P011	16	16	10	5	5	3	3	1
P012	32	28	26	23	8	6	7	4
P013	27	22	25	22	5	6	5	6
P014	30	23	15	2	5	4	3	1
P015	29	24	22	16	6	6	5	3
P016	28	25	27	25	7	7	7	6
P017	36	32	25	21	8	7	6	5
P018	17	17	12	6	5	4	2	2
P019	29	26	21	20	7	6	6	5
P020	33	33	34	35	8	7	7	7
P021	31	19	16	10	6	6	3	2
P022	34	30	26	23	8	6	5	4
P023	32	30	27	26	7	7	6	4
P024	27	26	20	11	6	6	4	3
P025	28	25	15	7	6	5	4	1
P026	20	16	12	6	4	4	2	1
P027	28	24	16	9	7	6	3	1
P028	38	33	28	19	8	6	5	4
P029	39	41	37	33	9	8	7	8
P030	14	16	13	6	5	3	3	2
P031	24	18	14	6	5	5	3	2

Patient_ID	Week1_UAS7	Week2_UAS7	Week4_UAS7	Week8_UAS7	Week1_Pruritus	Week2_Pruritus	Week4_Pruritus	Week8_Pruritus
P032	17	17	13	11	5	3	3	2
P033	26	21	17	9	6	3	4	2
P034	24	19	12	8	7	5	3	2
P035	26	25	19	9	5	5	3	2
P036	30	27	21	15	6	4	4	2
P037	24	16	12	11	5	6	5	3
P038	26	20	12	8	6	6	4	2
P039	25	16	16	6	6	5	3	1
P040	27	20	12	5	6	5	3	1
P041	30	25	22	12	6	6	5	3
P042	34	31	20	19	9	8	5	5
P043	28	26	23	23	6	6	6	5
P044	34	30	29	19	7	6	5	5
P045	27	20	16	12	6	5	4	4
P046	29	23	19	12	6	6	4	3
P047	14	10	10	9	5	5	3	3
P048	14	16	14	9	5	5	3	3
P049	9	9	5	1	4	3	1	1
P050	35	30	22	8	8	6	5	2
P051	28	28	25	21	5	4	5	4
P052	22	19	17	12	6	5	4	4
P053	32	24	23	13	7	6	5	3
P054	30	24	22	21	5	6	4	4
P055	12	9	10	8	4	5	2	2
P056	41	39	40	36	9	9	8	7
P057	31	27	24	19	7	5	4	4
P058	24	21	16	16	4	5	4	4
P059	33	30	26	18	8	6	5	4
P060	28	21	13	4	6	4	2	1

Appendix Table A3. Functional Interference, Follow-up flare, Safety, and Response Variables

Patient_ID	Sleep_Interference_Baseline	Sleep_Interference_Week8	Daily_Activity_Interference_Baseline	Daily_Activity_Interference_Week8	Recurrence_Flag	Adverse_Event	Clinical_Response
P001	7	6	5	4	No	None	Mild improvement
P002	4	6	4	4	Yes	None	No meaningful improvement
P003	1	0	4	1	No	None	Moderate improvement
P004	5	1	6	2	No	None	Marked improvement
P005	2	1	5	1	No	None	Marked improvement
P006	6	3	5	3	No	Transient headache	Moderate improvement
P007	5	4	8	5	No	None	Moderate improvement
P008	6	3	5	2	No	Transient dizziness	Marked improvement
P009	5	2	5	1	No	None	Marked improvement
P010	8	5	9	6	No	None	Moderate improvement
P011	7	3	7	3	No	None	Marked improvement
P012	4	3	7	4	No	None	Mild improvement
P013	6	6	6	6	Yes	None	No meaningful improvement
P014	5	2	6	2	No	None	Marked improvement
P015	7	4	8	6	No	Transient headache	Moderate improvement
P016	6	5	7	6	Yes	None	No meaningful improvement
P017	7	5	8	5	No	None	Mild improvement
P018	5	3	6	3	No	None	Moderate improvement
P019	5	3	10	6	No	None	Mild improvement
P020	7	7	8	8	Yes	None	No meaningful improvement
P021	6	3	8	3	No	None	Moderate improvement
P022	7	4	7	5	No	None	Mild improvement
P023	4	3	6	7	No	None	No meaningful improvement
P024	7	2	8	4	No	None	Moderate improvement
P025	7	3	7	4	No	None	Marked improvement
P026	6	2	4	1	No	None	Marked improvement
P027	6	3	8	5	No	None	Marked improvement
P028	6	3	9	6	No	None	Moderate improvement
P029	7	7	7	6	Yes	None	No meaningful improvement
P030	3	2	5	3	Yes	None	Moderate improvement
P031	7	3	6	3	No	None	Marked improvement
P032	3	2	4	3	No	None	Moderate improvement
P033	6	3	6	3	No	Transient nausea	Moderate improvement
P034	9	3	6	2	No	None	Moderate improvement
P035	4	2	7	3	No	None	Marked improvement
P036	7	3	9	5	No	None	Moderate improvement
P037	8	5	5	3	No	Transient headache	Moderate improvement
P038	5	1	9	4	No	None	Marked improvement
P039	5	1	6	3	No	None	Marked improvement
P040	6	1	8	4	No	None	Marked improvement
P041	5	2	7	4	No	None	Moderate improvement
P042	7	5	8	5	No	None	Moderate improvement
P043	6	5	5	5	No	None	No meaningful improvement
P044	7	5	7	4	No	None	Moderate improvement
P045	7	4	6	3	No	None	Moderate improvement
P046	4	2	9	5	No	None	Moderate improvement
P047	3	2	6	5	No	None	Mild improvement
P048	4	3	4	2	Yes	None	Moderate improvement

Patient_ID	Sleep_Interference_Baseline	Sleep_Interference_Week8	Daily_Activity_Interference_Baseline	Daily_Activity_Interference_Week8	Recurrence_Flag	Adverse_Event	Clinical_Response
P049	6	2	4	1	No	Transient nausea	Marked improvement
P050	7	3	9	4	No	None	Marked improvement
P051	5	4	6	5	No	None	Mild improvement
P052	5	3	6	4	No	None	Mild improvement
P053	5	3	7	4	No	None	Moderate improvement
P054	5	3	6	4	No	None	Mild improvement
P055	3	2	4	2	Yes	None	Mild improvement
P056	7	6	7	6	Yes	None	No meaningful improvement
P057	5	3	6	4	No	None	Mild improvement
P058	4	2	5	4	No	None	Mild improvement
P059	5	3	7	5	No	None	Moderate improvement
P060	6	1	7	2	No	None	Marked improvement