

Mindfulness-Based Stress Reduction Techniques Among Healthcare Workers in South India: A Regional Analysis of Efficacy and Barriers

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Abstract

Healthcare workers (HCWs) in India, particularly in resource-limited settings, face high levels of occupational stress, yet structured stress-reduction interventions remain underutilized. Mindfulness-Based Stress Reduction (MBSR) offers a potential solution, but implementation challenges persist. To assess the effectiveness of an 8-week MBSR programme in reducing stress and enhancing mindfulness among HCWs in South India, and to identify barriers to its successful implementation across urban and rural settings. A quasi-experimental study was conducted with 450 HCWs (doctors, nurses, technicians) from 10 urban and rural hospitals. Participants were randomized into MBSR ($n = 225$) and control ($n = 225$) groups. The Perceived Stress Scale (PSS) and the Five Facet Mindfulness Questionnaire (FFMQ) were used for evaluation before and after the intervention. Qualitative data on implementation barriers were also collected. The MBSR group showed a significant reduction in stress scores (28.4 ± 4.2 to 19.1 ± 3.8 ; $p < 0.001$), while the control group saw minimal changes (27.9 ± 4.5 to 26.3 ± 4.1 ; $p = 0.12$). Significant improvements were observed in the FFMQ domains of 'Observing' (24.1 ± 3.5 to 28.9 ± 2.7 ; $p < 0.001$) and 'Non-Reactivity to Inner Experience' (18.3 ± 2.8 to 22.4 ± 3.1 ; $p = 0.001$). Barriers to implementation included limited respite time (82% rural vs. 65% urban), cultural stigma (53% rural vs. 28% urban), and inadequate institutional support (18% rural vs. 40% urban). The MBSR programme was effective in reducing stress and enhancing mindfulness among HCWs in South India. However, successful implementation demands region-specific planning to overcome challenges such as time constraints, stigma, and inconsistent institutional backing, especially in rural settings.

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INTRODUCTION

The healthcare professionals (HCWs) of South India are increasingly stressed because of overwhelming workloads, inadequate resources, and burnout from the pandemic. Recent surveys suggest that 63% of Indian HCWs suffer from moderate to severe stress, and South India has particularly stigma against mental illness and lack of funding greatly reduce the use of these programs [1]. For example, a survey conducted in 2023 stated that only 22% of South Indian hospitals have MBSR offered as compared to 45% in Western India [2]. This study looks at the

impact of MBSR among HCWs in urban and rural South India in conjunction with studying the barriers to implementation high numbers due to its population and healthcare services [3]. Mindfulness-based Stress Reduction (MBSR), which is an intervention combining yoga and meditation, has been effective in stress reduction globally [4]. However, in South India,

METHODOLOGY

Study Design and Population

A quasi-experimental study using both quantitative and qualitative analysis was carried out between June 2022 and May 2023 across 10 hospitals located in Tamil Nadu, Karnataka, and Kerala. A total of 450 HCWs (doctors, nurses, and technicians) were recruited and randomized into intervention MBSR programme and control groups [5].

Intervention

- MBSR Programme: a progressive course conducted over eight weeks consisting of 90-minute sessions each on breath awareness, body scanning, and mindful movement.
- Control Group: Received pamphlets on stress management techniques without the structured training component.

Data Gathering

1. *Stress level*: Obtained using the Perceived Stress Scale (PSS) before and after the intervention.
2. *Mindfulness skills*: Evaluation through the Five Facet Mindfulness Questionnaire (FFMQ).
3. *Barriers*: Questionnaire on strong time limitation, cultural acceptance, and organizational support.

Statistical Analysis

With SPSS v28, the data was analyzed. Paired t-tests were conducted for pre and post scores, and chi-square tests assessed the categorical variables. (Table 1)

RESULTS

The findings presented in Table 1 illustrate the differences in mental stress among participants subjected to Mindfulness-Based Stress Reduction (MBSR) therapy and those in a control setting. As noted in the previous section, both participant groups had per-stress scale values in the range of 27 – 28, with the MBSR group averaging 28.4 (± 4.2) and the control group at 27.9 (± 4.5). After the MBSR intervention, participants' mental stress levels significantly improved, with their post-MBSR PSS score averaging (± 4.5) 19.1 (± 3.8) ($p < 0.001$). Furthermore, participants in the control group showed only mild improvement in their scores, with their average PSS score post-intervention being 26.3 (± 4.1) ($p = 0.12$).

These outcomes are in line with previous research which posits that MBSR interventions aid in the reduction of stress by improving emotional regulation and mindfulness. The lack of meaningful change in the control group results highlights the enduring nature of stress symptoms in subjects who do not have any systematic treatment, in line with research that indicates there is little to no change in stress levels in the absence of deliberate efforts [6]. The sizeable sample used in the study ($n = 225$ per group) lends additional credibility to these findings, which points to MBSR being an intervention that can easily be instituted for the management of stress in populations with heightened occupational stress. (Table 2)

Table 1. Pre- and post-intervention stress scores (PSS).

Group	Pre-intervention (Mean $\pm$ SD)	Post-intervention (Mean $\pm$ SD)	*p*-value
MBSR Group (n=225)	28.4 $\pm$ 4.2	19.1 $\pm$ 3.8	<0.001
Control Group (n=225)	27.9 $\pm$ 4.5	26.3 $\pm$ 4.1	0.12

The data in this table exemplify the unique gaps in self-care and mental health care access faced by urban and rural healthcare workers (HCWs) in northern India.

Rural health care workers reported a “lack of time” as a barrier to self-care far more than their urban counterparts (82% versus 65%, $p = 0.005$). This is likely due to chronic under-staffing and heavy workloads in rural settings [7]. Moreover, the stigma culturally associated with mental health recovery was more pronounced in rural areas (53% vs. 28%; $p < 0.001$). This finding supports studies attributing rural stigma to an absence of mental health literacy as well as deeply rooted societal norms [8]. In contrast, urban HCWs had better institutional support (40% vs. 18%; $p = 0.002$), illustrating the relative neglect of systemic rural healthcare infrastructure [9]. The cumulative effect of cultural and structural barriers in rural areas is accentuated by the combination of stigma and resource gaps that impede self-care. Targeted stigma-reduction campaigns alongside equitable resource distribution are more effective in improving mental health access for rural HCWs. These findings echo endorsements from this researcher, who rooted rural stigma in misconceptions regarding mindfulness being “non-traditional” exercises. (Table 3)

Significant improvements were observed in mindfulness-related outcomes following the intervention. The Observing facet scores improved from 24.1 (± 3.5) to 28.9 (± 2.7) post-intervention, indicating increased attention focus on internal and external experiences, which was statistically significant ($p < 0.001$) (Baer et al., 2006). In the same manner, Non-Reactivity scores showed progression from 18.3 (± 2.8) to 22.4 (± 3.1) with a statistically significant result of ($p = 0.001$), which demonstrated lesser non-reactive impulsive responses towards constructive thoughts and emotions [10]. These findings underscore the effectiveness of the intervention in enhancing mindfulness skills, reinforcing previous research asserting that these traits can be changed through deliberate exercises. The changes were accompanied by a reduction in standard deviations (post-intervention), suggesting that all participants responded similarly to the intervention, which contends that responsiveness improved after the programme [11].

DISCUSSION

The outcomes of the research are aligned with the work done on MBSR’s impact on South Indian healthcare workers (HCWs), which noted a considerable decrease in stress levels and an improvement in mindfulness skills. Resulting decrease in Perceived Stress Scale (PSS) scores is in line with Gu’s findings on the effects of mindfulness practices on emotional regulation and resilience, according to this study. Worsening Observing and Non-Reactivity facet scores suggest that participants were more responsive to stressful a situation which suggests that their attention was made mindful and less reactive to pull, which has been noted to result from mindfulness training [12].

As noted, time constraints (82%) and cultural stigma (53%) were greater obstacles for rural HCWs. The combination of traditional views and the heavy workload in low-resource regions present considerable mental health barriers. These systemic gaps were perpetuated by 18% rural institutional support neglecting mental health infrastructure.

Table 2. Barriers to MBSR adoption.

Barrier	Urban HCWs (n=150)	Rural HCWs (n=150)	*p*-value
Lack of Time (%)	65%	82%	0.005
Cultural Stigma (%)	28%	53%	<0.001
Institutional Support (%)	40%	18%	0.002

Table 3. Mindfulness skill improvement (FFMQ scores).

Facet	Pre-Intervention (Mean $\pm$ SD)	Post-Intervention (Mean $\pm$ SD)	*p*-value
Observing	24.1 $\pm$ 3.5	28.9 $\pm$ 2.7	<0.001
Non-Reactivity	18.3 $\pm$ 2.8	22.4 $\pm$ 3.1	0.001

This research argues this creates a vicious cycle of stress. While better resource access was noted by urban HCWs (40% institutional support), these gaps require policy attention. As stated, cultural stigma, more prevalent in rural areas, stems from implementing invalidated mindfulness traditions, warranting development attention.

Lowered standard deviations in post-intervention FFMQ scores suggest increased participant consistency and mastery of mindfulness skills, indicating MBSR training enhances performance optimally among many participants. On the other hand, the control group's unchanged stress scores illustrate stagnated efficiency resulting from brochures and underscore the need for more proactive, skill-based interventions [13].

CONCLUSION

Our research positions MBSR in South Indian HCWs as an effective technique with statistically significant stress reduction and enhancement of mindfulness skills. However, successful implementation must address region-specific barriers. Stigma residing within rural communities requires identity-shifting community education campaigns, whereas urban efforts need to optimize existing participation retention supports. There is a gap in appropriate funding to address MBSR resource allocation disparities between rural and urban areas region allocated culturally appropriate methods to adapt MBSR. School administrators and health system planners need to develop policies that manage these borders to aid effective rural-urban resource distribution. Further exploring the longitudinal effects and economically efficient scaling methods would prepare the approach for future challenges. With structural policies alongside mindfulness frameworks, proactive HCW welfare supervision can be achieved to transform high-demand care environments, improving overall patient care.

Recommendations

1. *Culturally framed*: Incorporate local elements such as yoga into MBSR for stigma reduction.
2. *Policy changes*: Enable reimbursement for time spent participating in mandated hospital wellness programme MBSR sessions.
3. *Rural outreach*: Equip mobile telehealth units and offer mindfulness telehealth sessions.

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