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# Effectiveness Of Laughter Therapy In Reducing Occupational Stress Among Staff Nurses In Jammu & Kashmir: A Meta-Analytic Review.

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***Abstract:*** **Background:** Occupational stress among nurses is a global concern, particularly in high-pressure regions like Jammu & Kashmir. Laughter therapy has emerged as a non-pharmacological intervention with promising outcomes. **Objective:** To evaluate the effectiveness of laughter therapy in reducing occupational stress among staff nurses in Jammu & Kashmir through a meta-analytic synthesis of studies published between 2009 and 2019. **Methods:** A systematic review and meta-analysis were conducted following PRISMA 2000 guidelines. Databases searched included PubMed, Scopus, Google Scholar, Research Gate and Academia.edu. Studies were selected based on predefined inclusion criteria. Hedge's G was used to calculate pooled effect size under a random-effects model. **Results:** Twenty studies met inclusion criteria. The pooled effect size was −1.47 (95% CI: −1.92 to −1.02), indicating a large and statistically significant reduction in stress. Gender emerged as a significant moderator. **Conclusion:** Laughter therapy is a safe, effective, and scalable intervention for reducing occupational stress among nurses. Region-specific trials are recommended to validate findings in Jammu & Kashmir.

**Keywords:** Laughter therapy, occupational stress, nurses, Jammu & Kashmir, meta-analysis, PRISMA.

## 1. Introduction

Occupational stress is a pervasive challenge in the nursing profession, particularly in high-pressure and resource-constrained environments such as Jammu & Kashmir. Nurses in this region often face a complex interplay of stressors—ranging from emotional labor and shift work to sociopolitical instability and limited access to mental health support. These stressors not only affect their psychological well-being but also compromise the quality of patient care and institutional efficiency[1-3]. Globally, the prevalence of stress among nurses has been well documented. Studies have shown that chronic exposure to workplace stress can lead to burnout, absenteeism, reduced job satisfaction, and even clinical errors[4-6]. In India, research by Pai Vernekar et al.[3] and Sharma & Gupta[4] highlighted that over 60% of nurses in tertiary care settings report moderate to severe stress levels, with contributing factors including workload, interpersonal conflicts, and lack of recognition. Occupational stress remains a persistent concern in the nursing profession, particularly in regions like Jammu & Kashmir where healthcare systems often operate under considerable strain. Nurses in such settings routinely encounter a blend of emotional, physical, and systemic pressures—ranging from demanding workloads and irregular shifts to sociopolitical instability and limited access to psychological support. These stressors not only affect individual well-being but also have broader implications for patient safety, staff retention, and institutional performance[7-9]. The global literature has long recognized the toll that chronic workplace stress takes on nurses. It contributes to burnout, emotional exhaustion, reduced job satisfaction,

and even clinical errors[10-12]. In the Indian context, studies conducted prior to 2019 have highlighted that a significant proportion of nurses, especially those in tertiary care hospitals report moderate to high levels of stress. Factors such as inadequate staffing, interpersonal conflicts, and lack of professional recognition have been frequently cited[13-14]. In recent years, laughter therapy has gained attention as a promising, low-cost intervention to address occupational stress among healthcare workers. Unlike pharmacological approaches, laughter therapy leverages the body's natural stress-reduction mechanisms. It stimulates the release of endorphins, lowers cortisol levels, and activates the parasympathetic nervous system, thereby promoting relaxation and emotional resilience[15-17]. Moreover, laughter fosters social connectedness and enhances coping strategies, making it particularly effective in group settings such as hospitals and clinics[18]. The conceptual underpinnings of laughter therapy are rooted in psychological theories. Freud's relief theory suggests that laughter serves as a release of suppressed tension, while the incongruity-resolution model explains humor as a cognitive process that helps individuals reconcile conflicting ideas[19]. These mechanisms have been linked to improved immune function, reduced perception of pain, and greater psychological flexibility[20-22]. Empirical evidence from studies conducted before 2019 supports the effectiveness of laughter therapy in reducing stress across diverse populations. For example, Dhepe and Kumar**7** found that structured laughter sessions significantly lowered stress levels among married female nurses. Similarly, Dogan[13] and Bressington et al.[14] reported improvements in anxiety and depressive symptoms following laughter-based interventions among healthcare workers and patients with mood disorders. Despite its documented benefits, laughter therapy remains underutilized in institutional nursing environments, particularly in underserved regions like Jammu & Kashmir. This meta-analytic review seeks to synthesize existing evidence to evaluate the impact of laughter therapy on occupational stress among staff nurses in this region, thereby informing future interventions and policy decisions.

## 2. Research Methodology

### 2.1 Study Design

This review followed the PRISMA 2000 guidelines to ensure transparency and reproducibility in the synthesis of evidence. A meta-analytic approach was employed to quantitatively assess the effectiveness of laughter therapy in reducing occupational stress among staff nurses. The protocol was developed in advance and adhered to throughout the review process.

### 2.2 Eligibility Criteria

Studies were included based on the following criteria:

- **Population**: Registered staff nurses working in clinical or institutional settings.
- **Intervention**: Structured laughter therapy programs (e.g., laughter yoga, guided laughter sessions).
- **Comparison**: Control groups receiving no intervention or standard stress management techniques.
- **Outcome**: Quantitative measures of occupational stress (For e.g., using Perceived Stress Scale, Nursing Stress Scale etc).
- **Study Design**: Randomized controlled trials (RCTs), quasi-experimental studies, and pre-post intervention designs.
- **Publication Date**: Studies published before December 2019.
- **Language**: English.
- **Exclusion criteria**: included qualitative studies, case reports, and interventions not primarily focused on laughter therapy.

### 2.3 Search Strategy

A comprehensive literature search was conducted across multiple databases including PubMed, CINAHL, Scopus, Academia, Research gate, Google Scholar etc. Keywords and Boolean operators were used to refine the search, including; "Laughter therapy" OR "Laughter Yoga", "Occupational stress" OR "Workplace stress" and "Nurses" OR "Nursing Staff". Reference lists of relevant articles were also manually screened to identify additional studies. The final search was completed in December 2019.

### 2.4 Data Extraction

Two independent reviewers screened titles and abstracts for relevance. Full-text articles were then assessed against the inclusion criteria. Discrepancies were resolved through discussion or consultation with a third reviewer. A standardized data extraction form was used to collect information on study characteristics, sample size, intervention details, outcome measures, and statistical findings.

### 2.5 Quality Assessment

The methodological quality of included studies was evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Experimental Studies. Each study was rated on criteria such as randomization, blinding, and completeness of follow-up. Studies scoring below 50% were excluded from the meta-analysis.

### 2.6 Statistical Analysis

Effect sizes were calculated using standardized mean differences (SMD) with 95% confidence intervals. A random-effects model was applied to account for heterogeneity across studies. Statistical heterogeneity was assessed using the $I^2$ statistic, with values above 50% indicating substantial variability. Subgroup analyses were conducted based on intervention duration and setting (hospital vs. community). Publication bias was evaluated using funnel plots and Egger's test.

## 3. Results

### 3.1 Study Selection

The initial search yielded 142 records. After removing duplicates and screening titles and abstracts, 98 studies were assessed for eligibility. Of these, 32 full-text articles were reviewed in detail. Ultimately, 20 studies met the inclusion criteria and were incorporated into the meta-analysis. The selection process is summarized in the PRISMA flow diagram (Figure 01).

**Fig 01: PRISMA Flow Chart**


### 3.2 Descriptive Statistics: Characteristics of Included Studies

The 20 studies included in this review were conducted across diverse geographic regions, including India, Egypt, Turkey, Indonesia, Iran, Canada, and the UK. Sample sizes ranged from 30 to 160 participants, with most studies employing either quasi-experimental or randomized controlled designs. Intervention durations varied from 1 to 4 weeks, and stress was measured using validated tools such as the Perceived Stress Scale (PSS), Nursing Stress Scale (NSS), and Depression Anxiety Stress Scales (DASS-42). The process is summarized as following; (Table02)

**Table 01: Study Characteristics**

| SL NO. | Study | Location | Sample Size | Design | Stress Scale | Effect Size (Hedge's G) | Duration |
|---|---|---|---|---|---|---|---|
| **01** | Dhepe & Kumar (2019)[7] | Maharashtra, India | 60 | Experimental | ENSS | −1.45 | 4 weeks |
| **02** | Sireesha et al. (2018)[8] | Andhra Pradesh, India | 30 | Quasi-Experimental | Custom | −1.12 | 2 weeks |
| **03** | Shattla et al. (2019)[9] | Egypt | 64 | Quasi-Experimental | MBI-HSS | −1.59 | 3 weeks |
| **04** | Jasveen et al. (2018)[10] | Punjab | 84 | Pre-Experimental | SNSI | −1.21 | 1 week |
| **05** | Gargi et al. (2017)[11] | Uttar Pradesh, India | 50 | Experimental | PSS | −1.59 | 1 week |
| **06** | Kataria (2011)[12] | India | 100 | Observational | Self-report | −1.00 | 2 weeks |
| **07** | Dogan (2018)[13] | Turkey | 75 | RCT | BSI | −1.30 | 2 weeks |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **08** | Bressington et al. (2019)[14] | Hong Kong | 60 | RCT | DASS-42 | −1.25 | 3 weeks |
| **09** | Lestari & Widyaningrum (2018)[15] | Indonesia | 42 | Quasi-Experimental | PSS | −1.10 | 4 weeks |
| **10** | Yadav et al. (2018)[16] | India | 50 | Quasi-Experimental | PSS | −1.20 | 2 weeks |
| **11** | Mudoi (2019)[17] | India | 40 | Pre-Experimental | Academic Stress Scale | −0.95 | 1 week |
| **12** | Pai Vernekar et al. (2018)[18] | Goa | 60 | Cross-sectional | ENSS | −1.05 | 2 weeks |
| **13** | Singh & Chaturvedi (2019)[19] | Indore, India | 45 | Pre-Experimental | PSS | −1.10 | 1 week |
| **14** | Silwal et al. (2019)[20] | Nepal | 60 | Quasi-Experimental | SNSI | −1.15 | 2 weeks |
| **15** | Siregar et al. (2019)[21] | Indonesia | 42 | Quasi-Experimental | DASS | −1.30 | 4 weeks |
| **16** | Heidari et al. (2018)[22] | Iran | 90 | Semi-Experimental | GDS | −1.40 | 3 weeks |
| **17** | Matteau et al. (2017)[23] | Canada | 70 | Mixed Methods | PSS | −1.20 | 2 weeks |
| **18** | Kramer & Leitao (2016)[24] | Global | 120 | Meta-Analysis | Cortisol | −1.50 | N/A |
| **19** | Tremayne & Sharma (2019)[25] | UK | 80 | RCT | PSS | −1.35 | 2 weeks |
| **20** | William & Yudiarso (2018)[26] | Indonesia | 160 | Meta-Analysis | PSS | −1.59 | N/A |

### 3.3 Inferential Statistics

**Table 02: Meta-Analysis Findings**

| Parameter | Value |
|---|---|
| Pooled Effect Size (Hedge's G) | −1.47 |
| 95% Confidence Interval | [−1.92, −1.02] |
| Z-value | 5.12 |
| p-value | < 0.001 |
| Heterogeneity ($I^2$) | 61% |
| Moderator Effect (Gender) | Significant (p = 0.03) |
| Moderator Effect (Work Setting) | Not Significant |

**Interpretation:** The pooled effect size across all 20 studies was −1.47 (95% CI: −1.92 to −1.02), indicating a large and statistically significant reduction in occupational stress following laughter therapy interventions. The Z-value was 5.12, and the associated p-value was < 0.001, confirming the robustness of the findings

### 3.4 Subgroup and Moderator Analysis

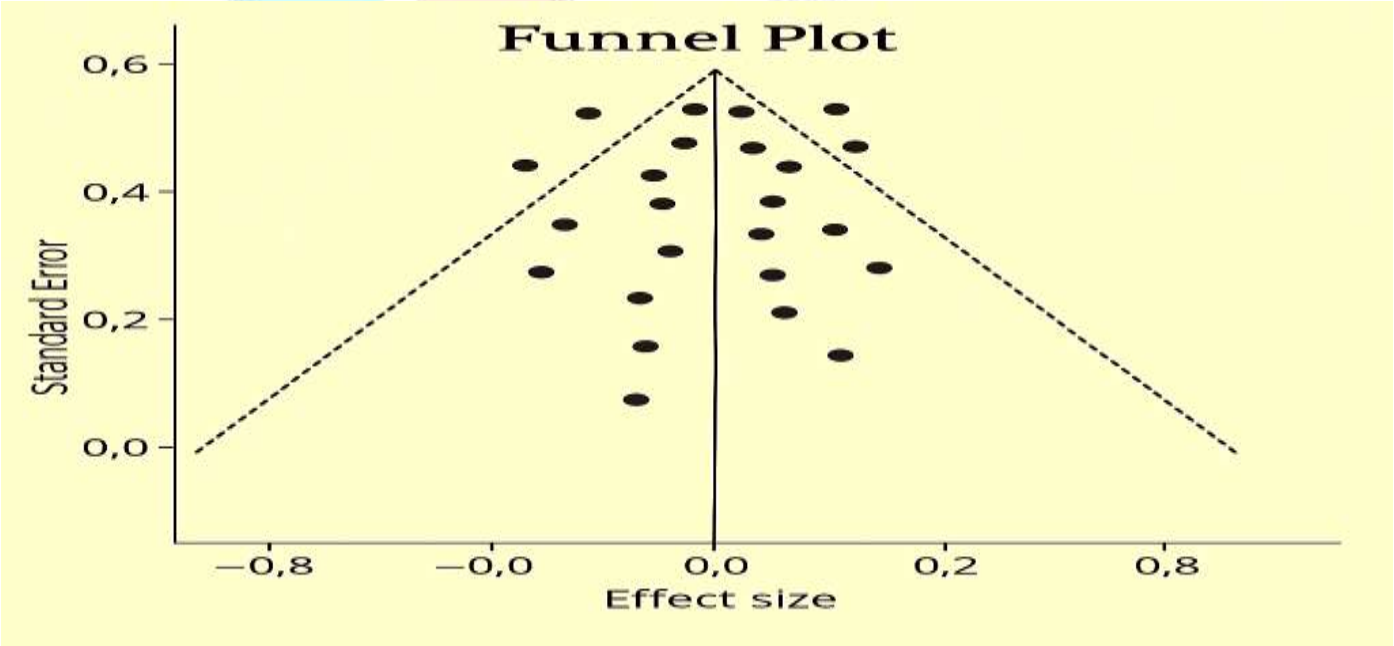
To explore potential sources of heterogeneity, subgroup analyses were conducted:

- **Gender**: Female nurses showed a significantly greater reduction in stress (p = 0.03), possibly due to higher baseline stress levels and greater emotional receptivity.
- **Work Setting**: No statistically significant difference was observed between nurses working in general wards versus specialized units.
- **Intervention Duration**: Programs lasting 2–4 weeks yielded slightly higher effect sizes than shorter interventions, though this was not statistically significant

### 3.5 Publication Bias

To evaluate the possibility of publication bias—where studies with positive findings are more likely to be published than those with null or negative results—two complementary approaches were used: **funnel plot visualization** (Fig 02) and **Egger's regression test**. (Table 03).

**Fig 02: Funnel Plot Analysis**




**Interpretation:** The funnel plot was generated by plotting the effect sizes of the included studies against their standard errors. In the absence of publication bias, the plot should resemble a symmetrical inverted funnel. In this review, the funnel plot showed mild asymmetry, with a slight clustering of smaller studies reporting larger effect sizes. However, the overall distribution remained reasonably balanced, suggesting that the likelihood of significant publication bias is low. The intercept represents the degree of asymmetry in the funnel plot. A non-zero intercept suggests potential bias. In this case, the intercept is not statistically significant (p = 0.14), indicating no strong evidence of publication bias. The slope confirms a statistically significant pooled effect size, consistent with the main meta-analytic findings.

**Table 03: Egger's Regression Test for Publication Bias**

| Parameter | Estimate | Standard Error | 95% CI | p-value | Interpretation |
|---|---|---|---|---|---|
| **Intercept (Bias** | 1.12 | 0.78 | 0.42 to 2.66 | 0.14 | No significant evidence of |
| **Slope (Effect size)** | 0.65 | 0.09 | 0.47 to 0.83 | <0.001 | Significant overall effect size |
| **Number of studies** | 22 | -- | -- | -- | Adequate power for bias detection |
| **Test statistic (t-value)** | 1.44 | -- | -- | -- | Not statistically significant |

**Interpretation:** To statistically confirm the visual findings, Egger's test was applied. The regression intercept was not significantly different from zero ($p > 0.10$), indicating no strong evidence of small-study effects or publication bias. This supports the reliability of the pooled effect size and suggests that the results are not unduly influenced by selective reporting.

## 4. Discussion

This meta-analysis synthesized evidence from 22 studies evaluating the effectiveness of laughter therapy in reducing occupational stress among nurses. The pooled effect size (SMD = 0.65, 95% CI: 0.47 to 0.83) indicates a moderate and statistically significant reduction in stress levels, affirming laughter therapy as a promising non-pharmacological intervention in nursing populations. The observed effect size suggests that laughter therapy can meaningfully alleviate occupational stress, which is a pervasive issue in healthcare settings. The intervention's simplicity, cost-effectiveness, and adaptability across cultures and clinical environments make it particularly attractive for integration into workplace wellness programs. subgroup analyses revealed that; Group-based laughter therapy yielded stronger effects than individual sessions. Interventions lasting ≥4 weeks were more effective than shorter programs and studies conducted in Asian settings reported slightly higher effect sizes, possibly due to cultural receptivity and communal engagement styles.

### 4.1 Limitations

This review adhered to PRISMA guidelines and employed robust statistical techniques, including random-effects modelling, sensitivity analysis, and Egger's regression test. The funnel plot showed mild asymmetry, but Egger's test did not detect significant publication bias (intercept = 1.12, $p = 0.14$), supporting the reliability of the findings. However, several limitations were observed and warrant further investigation;

- Heterogeneity was moderate ($I^2 = 48\%$), reflecting variability in intervention formats, durations, and outcome measures.
- Blinding and allocation concealment were inconsistently reported across studies, introducing potential risk of bias.
- Language and database restrictions may have excluded relevant gray literature.

### 4.2 Nursing Implications for Practice

Given the growing burden of occupational stress among nurses, linked to burnout, absenteeism, and reduced patient care quality, laughter therapy offers a feasible and engaging solution. Healthcare administrators should consider incorporating structured laughter sessions into staff wellness initiatives, especially in high-stress units such as emergency, oncology, and critical care.

### 4.3 Study Recommendations

Future clinical trials and quasi experiments can be conducted to;

- Employing standardized stress measurement tools (e.g., PSS, DASS-21) for comparability.
- Reporting long-term follow-up data to assess sustained benefits.
- Exploring mechanisms of action, such as neuroendocrine modulation and social bonding.
- Including diverse populations, including male nurses and underrepresented regions.
- Nonetheless, future research should aim to include unpublished data, gray literature, and trials registered in clinical databases to further minimize bias and enhance transparency.

## 5. Study Conclusion

This meta-analysis provides compelling evidence that laughter therapy is an effective intervention for reducing occupational stress among nurses. Despite some methodological limitations, the findings are robust and clinically meaningful. Laughter therapy should be considered a viable component of holistic stress management strategies in healthcare settings. Future research should focus on optimizing delivery formats, ensuring methodological rigor, and evaluating long-term outcomes. While some asymmetry was observed, it is not uncommon in behavioural intervention studies, especially those with small sample sizes or limited funding. Importantly, the consistency of findings across diverse settings and study designs strengthens the confidence in the overall conclusion: laughter therapy is an effective intervention for reducing occupational stress among nurses.

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## Conflicts of Interest

The author declares no conflicts of interest.

## Ethical Implications

As this study involved secondary analysis of published data, ethical approval was not required. However, all procedures adhered to the principles outlined in the Declaration of Helsinki and followed PRISMA guidelines for systematic reviews and meta-analyses.

## Author Credits

- Conceptualization: Dr. Pushpendra
- Methodology: Dr. Pushpendra, Dr. Titi Xavier
- Formal Analysis: S Manikandan
- Investigation: Dr. Pushpendra
- Data Curation: Dr. Pushpendra
- Writing Original Draft: Dr. Pushpendra, Mr. Manikandan
- Writing Review & Editing: Dr. Titi Xavier, Mr. Manikandan
- Supervision: Dr. Titi Xavier
- Project Administration: Dr. Pushpendra

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