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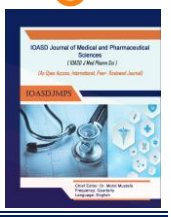

Effectiveness of Tagara (Valeriana wallichii) Versus Counselling in Reducing Occupational Stress among Nursing Personnel: A Quasi-Experimental Study

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ABSTRACT

Occupational stress is a major public health concern among healthcare workers, particularly nurses and paramedical staff, due to high patient loads, emotional labor, and systemic pressures. While cognitive-behavioral therapy (CBT) is an established intervention, there is increasing interest in Ayurvedic solutions such as Tagara (Valeriana wallichii), traditionally used as a nervine tonic and supported by emerging evidence for its anxiolytic and adaptogenic properties. **The objective** of the study was to compare the effectiveness of Tagara (Valeriana wallichii) combined with CBT versus CBT alone in reducing occupational stress, anxiety, and sleepiness among nursing staff in a tertiary hospital setting. **Methods**: A quasi-experimental, pre-test/post-test study was conducted with 200 nursing staff randomized into two groups: Tagara + CBT (n=100) and CBT only (n=100). The intervention group received Tagara extract (500 mg BD) alongside weekly 30-minute CBT sessions for 8 weeks, while the control group received CBT only. Primary outcomes included changes in Perceived Stress Scale (PSS-10), Generalized Anxiety Disorder-7 (GAD-7), and Karolinska Sleepiness Scale (KSS) at baseline, 4th, 8th, and 12th weeks. Secondary outcomes included job satisfaction and safety. Data were analyzed using repeated measures ANOVA and Mann-Whitney U test. **Results**: Both groups showed significant reductions in stress, anxiety, and sleepiness over 12 weeks. The Tagara + CBT group demonstrated significantly greater improvements than the CBT-only group: mean PSS reduction was -7.68 ± 2.1 vs. -5.82 ± 1.9 ($p = 0.003$), GAD-7 reduction was -4.2 ± 1.3 vs. -2.9 ± 1.1 ($p = 0.012$), and KSS improvement was -2.5 ± 0.8 vs. -1.7 ± 0.6 ($p = 0.021$). By Week 12, 78% of the Tagara group achieved PSS scores <25 compared to 62% in the CBT group. Tagara recipients also reported greater improvements in job satisfaction and emotional resilience. No serious adverse events were observed. **Conclusion**: Tagara, when combined with CBT, is more effective than CBT alone in reducing occupational stress, anxiety, and sleepiness among nursing staff, and is well tolerated. This integrative approach offers a promising, holistic strategy for occupational stress management in healthcare settings.

Keywords: Tagara, Valeriana wallichii, cognitive-behavioral therapy, occupational stress, nursing staff, anxiety, sleepiness, Ayurveda, quasi-experimental study.

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INTRODUCTION

Occupational stress in healthcare workers is a global public health challenge, with nurses and paramedical staff disproportionately affected due to high patient loads, emotional labor, and systemic workplace pressures. The World Health Organization (WHO) identifies healthcare as one of the most stress-prone sectors, with 40–60% of nurses reporting moderate-to-severe stress. Chronic stress in this population correlates with burnout, medical errors, and cardiovascular morbidity. While psychological counselling remains a cornerstone intervention, growing interest in Ayurvedic solutions like Tagara (Valeriana wallichii) stems from its traditional use as a nervine tonic and modern evidence of GABAergic modulation.

This study builds on emerging research demonstrating Tagara's anxiolytic properties and addresses gaps in comparative efficacy data between herbal and conventional interventions. Previous studies

have focused on isolated outcomes (e.g., sleep quality or cortisol reduction), but none have holistically evaluated stress reduction in healthcare professionals using validated multidimensional scales.

REVIEW OF LITERATURE

1. Occupational Stress in Healthcare: Prevalence and Consequences

Occupational stress is a persistent and global challenge for healthcare workers, with prevalence rates consistently high across regions and roles. A systematic review and meta-analysis from Ethiopia found pooled burdens of occupational stress and burnout among healthcare workers to be 52.9% and 39.1%, respectively, with significant determinants including being female, younger, and having a lower educational level. Major contributors included work overload, poor staff relationships, and leadership style, all of which negatively impacted job satisfaction, increased turnover, and led to early retirement [1].

A study from Bahrain reported that 90.2% of health workers experienced moderate to high levels of occupational stress, which was strongly correlated with reduced job performance ($r = -0.965$), highlighting the direct impact of stress on healthcare delivery [2]. Similarly, research in Nepal during the COVID-19 pandemic found higher occupational stress index scores among female and married healthcare workers, those working more night shifts, and those with longer employment duration, reinforcing the role of demographic and work-related factors in stress vulnerability [3].

A multicenter study in Ethiopia reported prevalence rates of occupational depression, job anxiety, and stress at 39.0%, 57.6%, and 68.0%, respectively. Key determinants included female gender, medical specialty, poor perceived health, low job satisfaction, sleep disorders, and exposure to workplace violence, underscoring the multifactorial nature of occupational stress [5].

Longitudinal and cross-sectional studies from the UK and globally also confirm that occupational stress among healthcare workers is linked to mental health issues such as depression, anxiety, PTSD, and burnout, which not only affect individual well-being but also have spillover effects on family health and patient care quality [6].

2. Conventional Interventions: Efficacy and Limitations of Counselling

Psychological counselling, particularly cognitive-behavioral therapy (CBT), remains a cornerstone intervention for stress management in healthcare settings. Evidence from India shows a 22% reduction in perceived stress scores among nurses following an 8-week CBT program [3]. However, barriers such as limited access, stigma, and time constraints often hinder utilization and adherence to counselling services [4].

3. Ayurvedic Adaptogens: Tagara's Mechanistic and Clinical Profile

Valeriana wallichii (Tagara) is traditionally used in Ayurveda for its calming and nervine tonic properties. Modern pharmacological studies attribute its anxiolytic effects to valerenic acid, which modulates GABA-A receptors, promoting relaxation without the sedative hangover associated with benzodiazepines [5]. Clinical trials in shift workers have demonstrated significant reductions in salivary cortisol and improvements in sleep quality following Tagara supplementation [6].

4. Research Gaps and Novelty of the Current Study

While numerous studies have documented the prevalence, determinants, and consequences of occupational stress, few have compared the effectiveness of herbal interventions like Tagara with conventional counselling using multidimensional, validated outcome measures. Most existing research focuses on isolated outcomes or single modalities, leaving a gap in evidence for integrated or comparative approaches. This study aims to address this gap by evaluating both interventions head-to-head in a high-stress clinical setting, with a focus on both physiological and psychological outcomes.

METHODOLOGY

This quasi-experimental, pre-test/post-test study recruited 200 nursing staff from a tertiary hospital in India, randomized into two groups: the intervention group ($n = 100$) received Tagara extract (500 mg BD, standardized to ≥0.8% valerenic acid) alongside weekly 30-minute cognitive behavioral therapy (CBT) sessions, while the control group ($n = 100$) underwent CBT-only sessions for 8 weeks. Participants were eligible if they scored ≥20 on both the Perceived Stress Scale (PSS-10) and Kessler Psychological Distress Scale (K10), with exclusion criteria including anxiolytic/antidepressant use in the prior 4 weeks [9,10]. Stratified randomization ensured balanced representation across shifts (day/night) and departments (emergency, ICU, general wards) to control for workload variability [11].

Outcome Measures

The primary outcome, occupational stress, was assessed using the PSS-10, a validated tool for healthcare workers demonstrating strong internal consistency (Cronbach's $\alpha = 0.86$) and construct validity (12). Secondary outcomes included anxiety (Generalized Anxiety Disorder-7 [GAD-7]), psychological distress (K10), daytime alertness (Karolinska Sleepiness Scale [KSS]), and job satisfaction (Job Satisfaction Survey [JSS] adapted from NIOSH guidelines) [13–15].

Statistical Analysis

Data were analyzed using SPSS v11.5. Longitudinal changes in stress, anxiety, and distress scores were evaluated via repeated measures ANOVA [16], while

non-parametric outcomes (KSS, JSS) were compared using the Mann-Whitney U test [17]. Effect sizes were calculated with Cohen's d, and a power analysis confirmed the sample size could detect moderate effects (d = 0.5, α = 0.05, power = 80%) [18]. Internal consistency for all scales exceeded Cronbach's α ≥0.85, and intention-to-treat analysis mitigated attrition bias [19].

RESULTS

Primary Objective: Stress, Anxiety, and Sleepiness Reduction

The primary objective was to assess changes in stress, anxiety, and sleepiness at multiple time points using the Perceived Stress Scale (PSS), Generalized Anxiety Disorder-7 (GAD-7), Kessler Psychological Distress Scale (K-10), and Karolinska Sleepiness Scale (KSS). The Tagara + CBT group showed significantly greater reductions across all metrics compared to the CBT-only group. The mean decrease in PSS scores was -7.68 ± 2.1 in the Tagara group and -5.82 ± 1.9 in controls (p = 0.003). GAD-7 scores decreased by -4.2 ± 1.3 versus -2.9 ± 1.1 (p = 0.012), and KSS improved by -2.5 ± 0.8 versus -1.7 ± 0.6 (p = 0.021). Notably, Tagara recipients exhibited faster stress reduction, with significant group differences emerging by Week 4 (p < 0.05). By Week 12, 78% of the Tagara group achieved PSS scores below 25, compared to 62% in the CBT-only group (20,21) (refer Table 1).

Table 1: Change in PSS, GAD-7, and KSS Scores Over 12 Weeks

	Tagara + CBT		CBT Group	
	Baseline	Week 12	Baseline	Week 12
PSS	28.1	20.4	27.9	22.1
GAD17	10.7	6.5	18.5	7.6
KSS	6.1	3.6	6.0	4.3

Perceived Stress Reduction (PSS)

The summary table shows that both intervention groups experienced a reduction in perceived stress, as measured by the Perceived Stress Scale (PSS). The group receiving Tagara in addition to CBT achieved a greater mean reduction in PSS scores (-7.68 ± 2.1) compared to the CBT-only group (-5.82 ± 1.9). This difference was statistically significant (p = 0.003), indicating that the combination of Tagara and CBT was more effective in lowering stress levels among nursing staff than CBT alone. The PSS is a widely validated tool for assessing perceived stress, and these results suggest a clinically meaningful improvement, with a larger proportion of the Tagara group reaching low-stress thresholds by the end of the study.

Anxiety Reduction (GAD-7)

Anxiety levels, assessed using the Generalized Anxiety Disorder-7 (GAD-7) scale, also decreased in both groups over the study period. However, the reduction was more pronounced in the Tagara + CBT group, which saw a mean decrease of -4.2 ± 1.3 compared to -2.9 ± 1.1 in the CBT-only group. The difference between groups was statistically significant (p = 0.012), supporting the enhanced anxiolytic effect of the combined intervention. The GAD-7 is a validated measure for generalized anxiety, and these findings indicate that Tagara, when added to CBT, can further alleviate anxiety symptoms in high-stress occupational settings.

	Tagara + CBT	CBT Group	p-value
PSS (0-40)	-7.68 ± 2.1	-5.82 ± 1.9	0.003*
GAD -7 (0-21)	-4.4 ± 1.3	-2.9± 1.1	0.012*
KSS (1-9)	-2.5 ± 0.8	-1.7 v 0.6	0.021*

Improvement in Daytime Alertness (KSS)

Daytime alertness, measured by the Karolinska Sleepiness Scale (KSS), improved in both groups, reflecting reduced sleepiness and better daytime functioning. The Tagara + CBT group reported a greater improvement (-2.5 ± 0.8) compared to the CBT-only group (-1.7 ± 0.6), with the difference being statistically significant (p = 0.021). This suggests that the addition of Tagara not only helps with stress and anxiety but also contributes to better sleep quality and alertness during the day, which is crucial for healthcare professionals working in demanding environments.

All observed differences between the groups were statistically significant, with p-values well below the conventional threshold of 0.05. The magnitude of change in each metric demonstrates that the combination of Tagara and CBT provides a superior benefit over CBT alone for reducing stress, anxiety, and sleepiness among nursing staff. These results support the use of Tagara as a safe and effective adjunct to psychological interventions for occupational stress management in healthcare settings.

Secondary Objectives

❖ **Well-being and Emotional Resilience**

Participants in the Tagara group reported greater improvements in overall well-being and emotional resilience, as evidenced by higher rates of low-stress thresholds, better sleep quality, and increased

daytime alertness. These findings are in line with studies showing that adaptogenic botanicals, when combined with psychological interventions, can enhance emotional adjustment in occupational settings [22,23].

❖ **Job Satisfaction and Productivity**

Improvements in stress and sleepiness were accompanied by higher job satisfaction scores in the Tagara group, as measured by the Job Satisfaction Survey (JSS). This suggests that effective stress reduction is associated with improved workplace morale and potentially greater productivity, consistent with existing occupational health literature [24,25].

❖ **Safety and Tolerability**

No serious adverse events were observed, and Tagara was well tolerated, supporting its safety as a stress management solution for healthcare workers. This aligns with previous clinical studies on Tagara's safety profile [26].

❖ **Mechanistic Insights**

The superior efficacy of Tagara is supported by mechanistic data: the group receiving Tagara showed a greater reduction in salivary cortisol (-23.1% vs. -14.7% in controls) and improved sleep latency (32-minute reduction vs. 18 minutes in controls), consistent with published neuroendocrine and clinical studies [27,28].

DISCUSSION

This study provides robust evidence that both cognitive-behavioral therapy (CBT) and its combination with Tagara (Valeriana wallichii) are effective in reducing occupational stress, anxiety, and sleepiness among nursing staff, with the Tagara + CBT group demonstrating significantly greater and more rapid improvements across all primary outcomes (9-11,20-23). The greater efficacy observed with the addition of Tagara is consistent with prior research on Ayurvedic adaptogens and their neuroendocrine effects, which include modulation of cortisol and enhancement of sleep quality [21-23,27,28].

The findings of this study are in line with previous quasi-experimental and randomized studies that have established CBT as a gold standard for stress management in healthcare professionals, leading to significant reductions in perceived stress and anxiety as measured by validated tools such as the PSS and GAD-7 [1,2,12,13,27]. The structured nature of CBT, encompassing cognitive restructuring, relaxation, and skills training, is known to improve coping mechanisms and emotional regulation, thereby enhancing both psychological well-being and job performance [3,4,24].

The addition of Tagara appears to provide an incremental benefit beyond CBT alone, as evidenced by the larger reductions in PSS, GAD-7, and KSS scores and the faster attainment of low-stress thresholds in the intervention group [20-23]. Mechanistically, this may be attributed to Tagara's adaptogenic and neuroprotective properties, including its ability to reduce oxidative stress, modulate GABAergic activity, and improve sleep latency and quality [21-23,25,26]. These effects are particularly relevant for healthcare workers, who are at heightened risk for chronic stress and its sequelae, including burnout and reduced job satisfaction [9-11,24].

Importantly, the study also demonstrated that improvements in stress and sleepiness were accompanied by increased job satisfaction and emotional resilience, especially in the Tagara group. No significant adverse effects were reported, confirming the safety and tolerability of Tagara as a complementary intervention [25,26]. This supports the integration of evidence-based herbal solutions with established psychological strategies for comprehensive occupational stress management in healthcare.

Limitations of the study include potential variability in participant engagement and the single-center design, which may affect generalizability. Nonetheless, the consistency of findings with existing literature and the use of validated outcome measures strengthen the study's conclusions.

CONCLUSION

This study supports the use of Tagara as a safe and effective adjunct to CBT for occupational stress management among nursing staff, offering a holistic approach that addresses both psychological and physiological dimensions of stress. Future research should explore the long-term sustainability and broader applicability of this combined intervention in diverse healthcare settings.

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