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Golden Calm: Effect of Curcumin-Enriched Turmeric Milk on Depression, Anxiety, and Stress among College Students

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Abstract: ***Depression, anxiety, and stress are increasingly common among college students due to academic, social, and personal pressures. Curcumin, a bioactive compound in turmeric, possesses neuroprotective and mood-enhancing properties. This study evaluated the effect of curcumin-enriched turmeric milk on depression, anxiety, and stress among college students residing in a girls' hostel. A pre-experimental one-group pre-test post-test design was adopted, involving 60 female B.Sc. Nursing students from Sri Siddhartha College of Nursing Girls Hostel, Tumkur, selected through convenient sampling. After ethical clearance (IEC No: SSMC/MED/IEC-003/Feb-2025), participants consumed 200 ml of warm turmeric milk fortified with 500 mg of curcumin daily for 21 days. The Depression Anxiety Stress Scale-21 (DASS-21) was administered before and after the intervention. Data were analyzed using descriptive and inferential statistics, with paired t-test applied to compare pre- and post-test scores. Mean pre-test scores for depression (16.8 ± 4.1), anxiety (14.2 ± 3.8), and stress (20.3 ± 5.2) significantly reduced to 10.5 ± 3.9, 8.3 ± 3.1, and 13.6 ± 4.7 respectively ($p < 0.001$). Participants also reported improved sleep, reduced fatigue, and enhanced mood stability. Thus, daily intake of curcumin-enriched turmeric milk effectively alleviated depression, anxiety, and stress, representing a simple, low-cost, and culturally acceptable approach to promote mental well-being among students.***

Keywords: Turmeric milk, depression, anxiety, stress, DASS-21

1. Introduction

College life is a period of rapid psychological and social transition during which students face multiple academic, interpersonal, and emotional challenges. Persistent exposure to stressors such as academic workload, examination pressure, and separation from family may lead to mental-health disturbances including depression, anxiety, and stress. Globally, the prevalence of depressive symptoms among university students ranges from 25% to 45% [1]. In India, mental distress among young adults is rising, emphasizing the urgent need for preventive and supportive strategies [2].

Psychological distress among students can negatively influence academic performance, sleep, interpersonal relationships, and overall quality of life. Conventional pharmacological therapies for depression and anxiety, though effective, are often accompanied by side effects and low adherence. Consequently, there has been a renewed interest in non-pharmacological, culturally acceptable, and natural interventions such as herbal and nutritional supplements [3].

Turmeric (*Curcuma longa*) is a well-known spice in Indian households, traditionally used for its anti-inflammatory and antioxidant properties. Its major active compound, curcumin, exhibits neuroprotective effects by modulating serotonin, dopamine, and brain-derived neurotrophic factors (BDNF), which play a central role in mood regulation [4]. Curcumin supplementation has shown potential in reducing depressive and anxiety symptoms in adults [5].

Curcumin-enriched turmeric milk—a traditional beverage known as "haldi doodh" or "golden milk"—combines the benefits of turmeric with milk proteins and healthy fats that enhance curcumin absorption. Several studies have demonstrated the psychological benefits of curcumin beverages. A randomized controlled trial revealed significant improvement in depressive symptoms following 8 weeks of curcumin supplementation[6]. Similarly, another study reported that daily turmeric milk intake improved mood and reduced perceived stress in healthy adults[7]

Despite growing evidence, limited research has explored the effect of turmeric milk among nursing students in India—a population frequently exposed to academic and clinical stress. The present study, therefore, aimed to assess the effect of curcumin-enriched turmeric milk on depression, anxiety, and stress among college students, with the hypothesis that regular intake would significantly reduce psychological distress as measured by DASS-21.

2. Materials and Methods

This study adopted a quantitative, pre-experimental one-group pretest–posttest design to evaluate the effectiveness of curcumin-enriched turmeric milk on depression, anxiety, and

stress. The study was conducted among female B.Sc. Nursing students residing in the girls' hostel of Sri Siddhartha College of Nursing, Tumkur, Karnataka.

Population, Sample, and Sampling Technique

The target population comprised all female undergraduate nursing students staying in the hostel. Sixty students who met the inclusion criteria were selected using convenient sampling. The inclusion criteria were: students aged 18–25 years, willing to participate, not currently on antidepressant or anxiolytic medication, and free from major psychiatric or chronic medical illness. Students allergic to milk or turmeric were excluded.

Intervention

Participants received 200 ml of warm cow's milk mixed with 500 mg standardized curcumin extract and a pinch of black pepper (to enhance bioavailability) once daily at bedtime for 21 days. The beverage was freshly prepared by the investigator and served under supervision to ensure compliance.

Data Collection Tool

The Depression Anxiety Stress Scale-21 (DASS-21) was used to assess psychological distress. It consists of 21 items with seven items per subscale, rated on a 4-point Likert scale (0–3). Higher scores indicate greater distress. The tool has high internal consistency (Cronbach's $\alpha = 0.88$).

Procedure

On Day 1, participants were oriented about the study, and written informed consent was obtained. A pretest assessment of depression, anxiety, and stress was conducted using DASS-21. The 21-day intervention was then implemented. On Day 22, the post test was conducted using the same instrument.

Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee of Sri Siddhartha Medical College and Research Centre, Tumkur (IEC No: IEC No: SSMC/MED/IEC-003/Feb-2025). Participation was voluntary, confidentiality was maintained, and withdrawal was permitted at any time.

Data Analysis

Data were coded and analyzed using SPSS version 25. Descriptive statistics (mean, standard deviation, percentage) were used to describe demographic and baseline variables. The paired *t*-test determined the significance of pre- and post-intervention differences. A *p*-value < 0.05 was considered statistically significant.

3. Results

Demographic Characteristics

Among the 60 participants, 78% were aged 18–21 years and 22% were aged 22–24 years. The majority (85%) belonged to nuclear families, and 68% reported moderate academic stress at baseline.

Table 1: Demographic Characteristics of Participants (N = 60)

Variables	Categories	f (%)
Age (years)	18–21	47 (78%)
	22–24	13 (22%)
Family type	Nuclear	51 (85%)
	Joint	9 (15%)
Residence	Urban	36 (60%)
	Rural	24 (40%)

Table 2: Mean and Standard Deviation of Pre- and Post-Test DASS-21 Scores (N = 60)

Variable	Pre-test Mean ± SD	Post-test Mean ± SD	t-value	*p*-value
Depression	16.8 ± 4.1	10.5 ± 3.9	8.42	< 0.001***
Anxiety	14.2 ± 3.8	8.3 ± 3.1	9.01	< 0.001***
Stress	20.3 ± 5.2	13.6 ± 4.7	7.65	< 0.001***

***p < 0.001 – highly significant

Overall Effect

The findings revealed a statistically significant reduction in all three domains of DASS-21 following daily consumption of curcumin-enriched turmeric milk, indicating improved mental well-being.

4. Discussion

The present study demonstrated that a 21-day intake of curcumin-enriched turmeric milk effectively reduced depression, anxiety, and stress levels among college students. The findings align with earlier research highlighting the psychotropic potential of curcumin. Similar studies carried out in past reported significant improvements in depressive symptoms and fatigue among adults receiving curcumin supplementation[6]. Similarly, another study found that turmeric milk improved mood and reduced cortisol levels in young adults[7]. The current study extends these findings to a student population using a simple dietary approach.

The observed improvement may be attributed to curcumin's ability to modulate monoamine neurotransmitters and suppress neuro-inflammatory pathways [4]. Moreover, the combination of curcumin with milk and black pepper enhances its bioavailability due to piperine-induced inhibition of glucuronidation[8].

In addition to biochemical effects, the nightly ritual of consuming warm turmeric milk may have contributed to psychological relaxation and better sleep hygiene, further reducing stress. Previous studies by Choudhary et al. (2020) and Kim et al. (2022) support that consistent bedtime routines and nutritional supplements rich in antioxidants improve perceived stress and sleep quality[9,10].

The findings are particularly relevant for nursing students who experience unique stressors such as clinical workload, shift duties, and examination anxiety. Incorporating a culturally acceptable and cost-effective intervention like turmeric milk within hostel settings could serve as a sustainable wellness strategy.

5. Conclusion

The study concludes that curcumin-enriched turmeric milk significantly reduces depression, anxiety, and stress among college students. It represents an inexpensive, accessible, and culturally favored strategy to promote mental wellness.

6. Implications for Nursing Practice

- Health Promotion: Nurses can integrate dietary approaches such as turmeric milk in mental-health promotion programs for students.
- Preventive Care: Regular use may prevent escalation of mild psychological distress to clinical depression or anxiety.
- Holistic Care: Promotes a non-pharmacological, culturally relevant, and holistic approach in nursing practice.
- Education: Nurse educators can include complementary therapies in health-promotion curricula.

7. Limitations

- Absence of a control group limits generalizability.
- Self-reported tool (DASS-21) may introduce response bias.
- Short intervention period; long-term effects remain to be explored.

8. Recommendations

- Future studies with randomized controlled designs and larger sample sizes are recommended.
- Biochemical markers such as serum cortisol or BDNF levels could be included to substantiate findings.
- Comparative studies on different curcumin dosages or formulations would enhance understanding.

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