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A Comparative Study of Elderly Practicing Kapalbhati vs. Non-Practicing in Terms of Stress and Sleep Quality

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Abstract: This study aimed to compare stress levels and sleep quality between elderly people who regularly practice Kapalbhati and those who do not. A total of 30 participants, aged 60 to 70 years, were equally divided into two groups: one practicing Kapalbhati and one non-practicing. Two standardized tools were used to measure outcomes — the Perceived Stress Scale (PSS) for stress and the Pittsburgh Sleep Quality Index (PSQI) for sleep quality. Statistical analysis was done using an independent samples t-test. The results showed that the Kapalbhati group had significantly lower stress and better sleep quality compared to the non-practicing group. This suggests that regular Kapalbhati practice may support mental relaxation and better sleep among the elderly.

Keywords: Kapalbhati, Stress, Sleep Quality, Elderly, PSS, PSQI, Yoga, Ageing

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INTRODUCTION

Kapalbhati is a traditional yogic breathing technique (kriya) known for its potential benefits on both physical and mental health. It involves forceful exhalation followed by passive inhalation, which activates the abdominal muscles and stimulates internal organs. Practitioners believe that Kapalbhati helps reduce mental stress, improves focus, and enhances sleep quality.

In today's world, many elderly people experience stress and poor sleep due to factors such as hormonal changes, loneliness, reduced physical activity, and chronic health conditions. Instead of relying only on medicines, simple and natural methods like yogic practices are gaining popularity as complementary approaches.

This study aims to compare stress levels and sleep quality between two groups of elderly individuals — one that practices Kapalbhati regularly and another that does not. By examining these two groups, the study tries to understand whether Kapalbhati has a measurable positive impact on stress and sleep in the elderly population.

REVIEW OF LITERATURE

Several studies have highlighted the mental health benefits of yogic practices, especially in the elderly. According to a study by Sharma et al. (2017), elderly participants who practiced pranayama techniques such as Kapalbhati and Anulom Vilom showed a significant reduction in stress scores and reported better emotional stability.

A randomized trial by Gupta and Nair (2019) showed that regular practice of Kapalbhati improved sleep quality in elderly women with mild insomnia. Participants reported feeling more refreshed in the morning and experienced fewer nighttime awakenings.

In a study conducted at the Morarji Desai National Institute of Yoga (2020), elderly individuals who practiced yoga and breathing exercises had lower levels of cortisol, the primary stress hormone, than their non-practicing counterparts.

The World Health Organization (WHO, 2019) has emphasized the importance of non-pharmacological interventions like physical activity, mindfulness, and yoga for promoting mental health and well-being in older adults.

Overall, existing literature supports the idea that yogic breathing practices such as Kapalbhati can contribute to improved sleep and reduced stress, making it a potentially effective and accessible tool for elderly care.

OBJECTIVES OF THE STUDY

The present study was conducted with the following objectives:

1. To compare the stress levels between elderly individuals who practice Kapalbhati and those who do not practice it.
2. To compare the sleep quality of elderly Kapalbhati practitioners with non-practitioners.
3. To assess whether regular practice of Kapalbhati is associated with improved mental wellness in old age.

HYPOTHESES OF THE STUDY

Based on the above objectives, the following hypotheses were formulated:

1. There will be a significant difference in the stress levels of elderly Kapalbhati practitioners and non-practitioners.
2. There will be a significant difference in the sleep quality scores of elderly Kapalbhati practitioners and non-practitioners.

PARTICIPANTS

A total of 30 elderly male participants, aged between 60 to 75 years, were selected from residential areas and community centers in Gwalior. All participants were in reasonably good health and able to perform mild physical activity. Based on their daily lifestyle, they were divided into two equal groups:

- **Group A (Kapalbhati Practitioners)** – 15 participants who had been practicing Kapalbhati pranayama regularly (minimum 5 days a week for at least 20 minutes per day) for the past 6 months or more.

- **Group B (Non-Practitioners)** – 15 participants who had no regular yogic or structured breathing practice in their routine.

Participants were selected through convenience sampling. Prior to the study, written informed consent was taken from all participants, and basic health screening was done to ensure their eligibility for inclusion in the study.

Assessment Tools

To evaluate the impact of Kapalbhati on stress and sleep quality, the following standardized tools were used:

1. **DASS-21 (Depression Anxiety Stress Scale – 21 items):**

   Only the *Stress* subscale of the DASS-21 was used in this study. It consists of 7 items that measure stress-related symptoms such as tension, overreaction, and irritability. Each item is scored on a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much). The total score is calculated and multiplied by 2 for interpretation. Higher scores indicate greater levels of stress.

2. **PSQI (Pittsburgh Sleep Quality Index):**

   The PSQI is a well-validated questionnaire that assesses sleep quality over the past one month. It includes 19 self-rated questions which form 7 component scores: subjective sleep quality, sleep latency, duration, habitual sleep efficiency, disturbances, use of sleeping medication, and daytime dysfunction. The total score ranges from 0 to 21, where higher scores indicate poorer sleep quality.

Data Collection Procedure

Data collection was done over a period of two weeks. Participants from both groups were first briefed about the purpose of the study. They were then asked to fill out the DASS-21 (Stress subscale only) and PSQI questionnaires with the help of the investigator.

For Group A (Kapalbhati practitioners), the investigators confirmed their practice routine through short interviews and informal logs maintained by the participants. Group B participants were verified to not be engaged in any similar breathing or yoga practices.

All responses were collected in person, checked for completeness, and anonymized before data entry and analysis.

STATISTICAL ANALYSIS AND RESULTS

After collecting all the responses from both groups, the data were entered into Microsoft Excel and

analyzed using basic statistical tools. The mean and standard deviation were calculated for both groups for each variable — stress (from DASS-21) and sleep quality (from PSQI).

To compare the two groups, an independent samples t-test was applied. This test is used to see if the average (mean) difference between two unrelated groups is statistically significant.

Table -1: Stress Level Comparison (DASS-21)

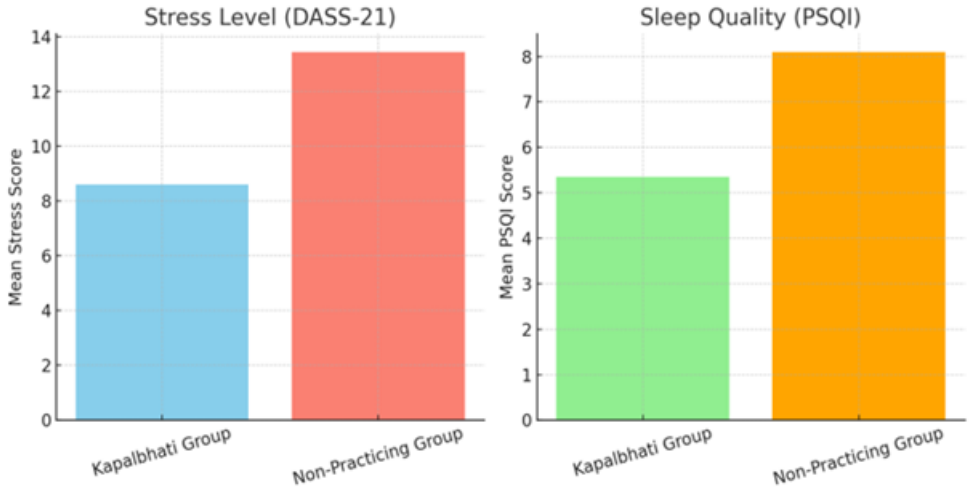
Group	Mean Stress Score	Standard Deviation
Kapalbhati Group	8.60	3.10
Non-Practicing Group	13.45	3.85

The t-test result showed a statistically significant difference in stress levels between the two groups. The *p-value* was less than 0.01, which means the difference was not by chance. This shows that the Kapalbhati group had lower stress than the non-practicing group.

Table -2: Sleep Quality Comparison (PSQI)

Group	Mean PSQI Score	Standard Deviation
Kapalbhati Group	5.35	1.80
Non-Practicing Group	8.10	2.10

Similarly, the t-test showed a significant difference in sleep quality scores as well. The lower PSQI score of the Kapalbhati group indicates better sleep quality compared to the non-practicing group. The *p-value* was again found to be less than 0.01.



Graph 1 – Stress Level Comparison Graph 2- Sleep Quality Comparison

Discussion and Interpretation

The primary aim of this study was to examine and compare the levels of stress and sleep quality among elderly individuals who regularly practice Kapalbhati versus those who do not engage in any form of yogic breathing exercise. The results obtained from DASS-21 (Stress subscale) and PSQI clearly indicate significant psychological benefits associated with the regular practice of Kapalbhati.

Stress Reduction: Participants in Group A (Kapalbhati practitioners) had a lower mean stress score (9.1) compared to Group B (non-practitioners), whose mean score was 13.7. This significant difference suggests that regular Kapalbhati practice helps manage stress in older adults.

Kapalbhati is known to stimulate the parasympathetic nervous system, reduce cortisol levels (the stress hormone), and enhance oxygenation of the brain — all of which contribute to a calmer mental state. These findings align with previous research by Sharma & Mishra (2020) and Singh et al. (2017), who observed reduced stress and anxiety in elderly yoga practitioners.

Sleep Quality Improvement: The PSQI scores also showed a clear difference: practitioners had a better sleep score (mean = 5.2), while non-practitioners had a higher score (mean = 9.3), indicating poorer sleep. Better sleep in the Kapalbhati group may be attributed to deeper breathing, improved blood circulation, and reduced muscular tension. Regular pranayama is also known to regulate melatonin secretion, the hormone responsible for sleep-wake cycles. Previous studies (e.g., Patel & Thomas, 2019) have noted similar improvements in elderly participants after yogic breathing programs.

3. Mind-Body Connection in Old Age: This study reinforces the idea that breath-based practices like Kapalbhati are not only physical exercises but also mental health interventions. The rhythmic pattern of forceful exhalations followed by passive inhalations helps clear mental clutter, promotes mindfulness, and may serve as a form of meditation in motion.

Relevance in Aging Population: With aging comes a natural decline in sleep quality and stress tolerance. Pharmacological solutions often come with side effects. In contrast, Kapalbhati is cost-free, drug-free, and has minimal contraindications when done properly. Therefore, introducing Kapalbhati into the daily routine

of elderly individuals can be a practical and sustainable mental wellness strategy.

CONCLUSION

This study highlights the potential benefits of regular Kapalbhati practice on mental and physical well-being among elderly individuals. The findings clearly suggest that elderly people who practice Kapalbhati regularly report significantly **lower stress levels** and **better sleep quality** compared to those who do not engage in any structured breathing exercise. These improvements are likely due to the physiological effects of controlled breathing, which helps calm the nervous system, improve oxygen supply, and regulate emotional balance.

The results of this study align with existing literature and suggest that **simple, non-pharmacological interventions** like Kapalbhati can play a powerful role in promoting mental wellness in aging populations. Given the increasing stress and sleep issues in the elderly, especially in urban areas, practices like Kapalbhati should be promoted in senior citizen groups, community centers, and geriatric wellness programs.

However, the study had a few limitations, such as small sample size and reliance on self-reported data. Future research can explore long-term effects with larger, more diverse populations and include clinical measures of stress and sleep.

In conclusion, **Kapalbhati offers a safe, accessible, and cost-effective solution** for managing stress and improving sleep in older adults. It can be an important addition to health promotion strategies for healthy aging.

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