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EFFECTIVENESS OF BRAIN GYM EXERCISE ON SLEEP QUALITY IN POSTMENOPAUSAL WOMEN

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ABSTRACT

Background:
Menopause is a natural biological process frequently associated with sleep disturbances due to hormonal changes. Poor sleep quality during the postmenopausal period adversely affects physical health, psychological well-being, and overall quality of life. Although pharmacological treatments are commonly used, their limitations highlight the need for safe and cost-effective non-pharmacological interventions.

Objective:
To assess the effectiveness of Brain Gym exercises on sleep quality in postmenopausal women.

Methodology:
A quasi-experimental study was conducted over a period of four weeks among 30 postmenopausal women aged 45–65 years with poor sleep quality (Pittsburgh Sleep Quality Index [PSQI] > 5). Participants were selected through community-based screening. Baseline sleep quality was assessed using the PSQI questionnaire. Brain Gym exercises were demonstrated by a qualified physiotherapist and practiced daily for 15–20 minutes for four weeks. Post-intervention PSQI scores were reassessed. Data were analyzed using descriptive statistics, Spearman's rho correlation, and paired t-test.

Results:
The mean PSQI score reduced from 6.87 ± 1.69 before intervention to 6.23 ± 1.63 after the intervention. Paired t-test analysis showed a statistically significant improvement in sleep quality ($p = 0.00018$). Spearman's rho analysis revealed a weak correlation between age and sleep quality scores, while a strong positive correlation was observed between pre- and post-intervention PSQI scores ($\rho = 0.86$, $p < 0.05$).

Conclusion:
Brain Gym exercises resulted in a modest but statistically significant improvement in sleep quality among postmenopausal women and may be considered a safe, cost-effective, complementary intervention for managing menopausal sleep disturbances.

KEYWORDS: *Menopause, Postmenopausal women, Brain Gym, Sleep quality, PSQI*

INTRODUCTION

Menopause is a normal biological stage in a woman's life characterized by the permanent cessation of menstruation resulting from the gradual depletion of ovarian follicles. It is clinically confirmed after twelve consecutive months of amenorrhea and usually occurs around the age of 51 years, with the transitional phase beginning near 47 years[1,2]. This stage is marked by declining estrogen levels, especially estradiol, leading to multiple physical, psychological, and cognitive changes. Common manifestations include vasomotor symptoms, disturbed sleep, emotional instability, and memory-related complaints[3].

Among these symptoms, sleep disturbances are particularly prevalent and distressing. Episodes of hot flashes and night sweats frequently interrupt normal sleep patterns, leading to fragmented and non-restorative sleep[3]. Persistent sleep disruption during menopause has been associated with fatigue, irritability, reduced attention span, and impaired memory, which negatively influence work efficiency, social interactions, and daily functioning[1,4]. In addition, inadequate sleep has been linked to increased vulnerability to anxiety and depressive symptoms, further diminishing quality of life[2].

Various treatment modalities such as hormone therapy, vaginal estrogen, lubricants, and nutritional supplementation are commonly used to manage menopausal symptoms[2]. However, these approaches are not suitable for all women due to medical contraindications, adverse effects, or individual preferences. Furthermore, pharmacological treatments often prioritize physical symptoms while providing limited relief for sleep-related, emotional, and cognitive difficulties. This has led to growing interest in complementary and non-pharmacological interventions.

Brain Gym is an educational kinesiology program introduced by Paul and Gail Dennison in the 1970s, consisting of 26 structured movement-based exercises aimed at enhancing coordination between both hemispheres of the brain[5]. These activities involve coordinated body movements that promote

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neural integration and are believed to support cognitive efficiency, emotional regulation, and stress reduction[6,7].

Although evidence regarding the use of Brain Gym in postmenopausal women is limited, preliminary studies indicate potential benefits in improving sleep quality, attention, and psychological well-being[8]. Considering the increased risk of long-term health issues such as osteoporosis, cardiovascular disease, and cognitive decline during menopause[1,2], early adoption of non-pharmacological strategies combining physical activity with cognitive stimulation may be beneficial[6,8]. Brain Gym represents a simple, economical, and non-invasive approach that may help women actively manage menopausal symptoms and enhance overall well-being[5,7].

OBJECTIVES

The objectives of this study are to assess the impact of Brain Gym exercises on sleep quality in postmenopausal women, to compare sleep quality scores before and after the Brain Gym intervention, and to analyze the data statistically to determine the correlation between the Brain Gym intervention and changes in sleep quality.

METHODOLOGY

The study design is quasi-experimental and the study type is cross-sectional, conducted over a duration of 4 weeks with the target population being postmenopausal women who attained menopause naturally. The inclusion criteria consisted of postmenopausal women aged 45-65 years, women having sleep disturbances or poor sleep quality (PSQI >5), women able to perform Brain Gym exercises and not receiving hormone replacement therapy or having discontinued HRT for at least 6 months. Exclusion criteria included women with psychiatric and neurological disorders, women taking sedatives or medications affecting sleep, and women experiencing uncontrolled chronic illnesses. The outcome measure used for assessing the sleep quality and disturbances over 1 month time interval was Pittsburgh Sleep Quality Index PSQI. After getting ethical approval and consent of the participants and PSQI assessment, a qualified physiotherapist demonstrated Brain Gym exercises to the participants, which were to be practiced daily for 15–20 minutes over 4 weeks. Sleep quality was reassessed at the end, and pre- and post-intervention scores were compared to measure improvements.

SAMPLING DESIGN

A total of 30 postmenopausal women were recruited from the neighbourhood of Talegaon city through community-based screening. The purpose and objectives of the study were explained to each participant. Written informed consent was obtained from all participants and Baseline sleep quality was assessed using a standardized questionnaire (e.g., Pittsburgh Sleep Quality Index – PSQI).

30 postmenopausal women aged 45-55having sleep disturbances were recruited in the study and Baseline sleep quality was assessed using a PSQI questionnaire.

A qualified physiotherapist demonstrated the Brain Gym exercises to the participants.
Participants were instructed to perform the Brain Gym exercises daily for 15–20 minutes over a period of 4 weeks.

At the end of the 4-week intervention, no drop outs were seen and each participant was reassessed using the same sleep quality tool. Pre- and post-intervention scores were compared to evaluate any improvements or changes in sleep quality.

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RESULTS

Statistical analysis was performed using Xrealstats and PowerBI. Descriptive statistics were applied to summarise the variables and Pre Psqi score and Post Psqi score, with results expressed as mean, standard deviation, median, and range.

PARTICULARS	MEAN ± SD	MEDIAN	MIN-MAX
AGE	51.47± 1.41	51.00	50.00-54.00

Descriptive Analysis of Pre And Post PSQI Scores

PARTICULARS	MEAN ± SD	MEDIAN	MIN - MAX
PRE PSQI SCORE	6.87 ± 1.69	7.00	5.00 - 11.00
POST PSQI SCORE	6.23 ± 1.63	6.00	4.00-10.00

The Spearman's Rho was used understand the correlation between age, pre psqi score and post psqi score.The results showed that there is weaker monotonic relation between Age and Pre Psqi Score and same with Age and Post Psqi score, however there was a positive monotonic relation between Pre and Post Psqi score

Significant at $p < 0.05$

The t test was used to compare the Pre and Post Psqi Score which gave a positive result showing significant P value which was 0.00018.

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	6.86666666666667	6.23333333333333
Variance	2.94712643678161	2.7367816091954
Observations	30	30
Pearson Correlation	0.885540869457743	
Hypothesized Mean Difference	0	
df	29	
t Stat	4.28939920250534	
P(T<=t) one-tail	0.0000907106966925152	
t Critical one-tail	1.6991270265335	
P(T<=t) two-tail	0.00018142139338503	

RESULT

Results of the study showed that Brain Gym exercises resulted in a modest but statistically significant improvement in the quality of sleep among postmenopausal women. The mean PSQI score decreased from 6.87 ± 1.69 before the intervention to 6.23 ± 1.63 after four weeks of practice, with the paired t-test confirming significance at $p = 0.00018$. Correlation analysis using Spearman's Rho revealed a weak monotonic relationship between age and both pre- and post-PSQI scores, and strong positive monotonic relationships between pre- and post-scores ($\rho = 0.86$, $p < 0.05$). These findings suggest that while age did not have a strong impact on sleep quality outcomes, Brain Gym exercises contributed measurably to improvements in sleep among participants.

DISCUSSION

The present study explored the impact of Brain Gym exercises on sleep quality in postmenopausal women. Results showed a reduction in the mean Pittsburgh Sleep Quality Index (PSQI) score from 6.87 before the intervention to 6.23 after four weeks of regular practice. Although the change was modest, it reflects a positive trend toward improved sleep quality. Participants also reported better rest and fewer sleep disturbances, suggesting that Brain Gym exercises may play a supportive role in managing sleep-related issues during the postmenopausal period.[1]

The null hypothesis, which proposed no difference in sleep quality following the Brain Gym intervention, was not supported by the findings. The observed improvements in post-intervention PSQI scores indicate that Brain Gym may contribute to better sleep outcomes, leading to the rejection of the null hypothesis. These results support the idea that structured, movement-based interventions can positively influence physiological and psychological well-being by reducing stress and enhancing relaxation.[2]

These findings align with previous studies that highlight sleep disturbances as among the most distressing symptoms of menopause, often linked to hormonal decline and vasomotor instability. Research by Kravitz and Joffe emphasized that poor sleep during the menopausal transition is associated with increased anxiety, depression, and reduced quality of life. The improvements seen in this study suggest that Brain Gym may offer a practical, non-pharmacological approach to managing these challenges, particularly for women who are not suitable candidates for hormone replacement therapy.[3]

According to Dennison and Dennison, Brain Gym involves cross-lateral and integrative movements that stimulate both hemispheres of the brain, potentially improving neural connectivity and emotional regulation. The findings of this study support this theoretical framework, as participants not only showed improved PSQI scores but also reported feeling less stressed and more balanced throughout the day.[4] These

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results are further supported by the IJFMR study conducted by Riddhi Khose and Dr. Vrushali Bhore, which demonstrated significant improvements in sleep quality and attention span among menopausal women following Brain Gym interventions. The present findings are consistent with and reinforce these outcomes.[5]

The clinical relevance of these findings lies in the simplicity, accessibility, and safety of Brain Gym. Unlike pharmacological treatments, which may have contraindications or adverse effects, Brain Gym is cost-effective and can be easily integrated into daily routines. This makes it a valuable complementary option for women seeking holistic management of menopausal symptoms. However, limitations such as the small sample size, short intervention period, and absence of a control group must be acknowledged, as they restrict the generalizability of the results.

CONCLUSION

This study concludes that Brain Gym exercises can modestly improve sleep quality in postmenopausal women. A reduction in PSQI scores after four weeks of intervention suggests that structured, movement-based activities may help alleviate sleep disturbances and reduce stress. Given its safety, simplicity, and affordability, Brain Gym shows promise as a non-pharmacological strategy to support well-being during menopause and complement conventional treatment approaches.

LIMITATIONS

1. Small sample size of 30 postmenopausal women within a narrow age range limits generalizability to larger, more diverse populations.
2. Short intervention duration (4 weeks) may not capture long-term effects on sleep quality and psychological well-being.
3. Absence of a control group makes it difficult to rule out external influences such as lifestyle changes, environmental factors, or placebo effects.
4. Reliance on self-reported measures (Pittsburgh Sleep Quality Index) is subject to recall bias and subjective interpretation despite being widely validated.

FUTURE SCOPE

Future studies should include larger, more diverse samples and longer follow-up periods to assess lasting effects. Randomized controlled trials with control groups are needed to confirm Brain Gym's effectiveness. Using objective sleep measures alongside self-reports will improve accuracy. Research on combining Brain Gym with other therapies like mindfulness or yoga could offer new insights for managing menopausal symptoms and support its wider clinical use.

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