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A STUDY TO ASSESS THE EFFECTIVENESS OF HOT WATER FOOT BATH THERAPY ON THE QUALITY OF SLEEP AMONG ELDERLY PEOPLE AT SELECTED OLD AGE HOME, DEHRADUN

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Abstract:
Aging is a normal process that happens throughout the life of a person and brings various changes. Age has an effect on the sleep cycle, increasing the amount of light sleep and decreasing the amount of deep sleep. This change to lighter sleep leads to a raise in brief awakenings, and more disturbance in sleep. In order to improve the quality of sleep, nurses must be vigilant in identifying and treating sleep problems by using interventions like hot water foot bath therapy. It enhances elderly people's sleep quality and helps them in preventing them from various sleep disorders.

Methodology: Quantitative approach with a quasi-experimental design was used by using PSQI Scale.

Settings and Design: A quasi-experimental design was adopted to fulfil the purpose of the study. The study was conducted at a selected Old Age Home in Dehradun.

Results: The findings of the study reveals that the mean post-test sleep quality of the control group (8.95±2.80) was higher than the mean post-test experimental group (4.00±0.97). This implies that there was a significant improvement in the quality of sleep in the experimental group as compared to the control group (t_{cal}= 7.468), $p< 0.05$).

Conclusions: The present study concluded that warm water foot bath was highly beneficial for improving sleep quality among elderly people.

Key-words: Quality of sleep, Hot water foot bath therapy, Elderly people

Key Message:

A person experiencing sleep disturbances should be aware of all non-pharmaceutical methods to prevent sleep disruptions in the future since most individuals are unaware of the need of excellent quality sleep for alertness, enhanced functioning the next day, and better quality of life.

INTRODUCTION:

Aging is a normal process that happens throughout the life of a person and brings various changes **(Clement,2011). According to WHO,** by 2050 2.1 billion people across the world will be older than 60 years of age and 426 million population will be 80 years and above **(WHO,2022).** Age has an effect on the sleep cycle, increasing the amount of light sleep and decreasing the amount of deep sleep. This change to lighter sleep leads to rising in brief awakenings, more disturbance in sleep, more time spent awake decreased time in bed that is spent sleeping, and less total sleep **(Reynolds & Adams, 2019).**

According to the National Sleep Foundation, people 65 and older still need 7-8 or 7-9 hours of sleep every night, depending on their age **(Hirshkowitz et al., 2015). According to the CDC worldwide 2022,** 70% of the older population is suffering from chronic sleep disorders, among which half of them go untreated, and 30% have been diagnosed with a sleep disorder. Chronic insomnia disorder, sleep-disordered breathing, restless legs syndrome. periodic limb movements in sleep, REM sleep behavior disorder, and advanced sleep-wake phase disorder are the major sleep disorders that are generally seen in older persons. Additionally, sleep efficiency below 80% doubles the risk of mortality among older people **(Praharaj et al., 2018)**

Hot water foot bath therapy is usually desirable to use non-pharmacological means to reduce sleep disruptions and increases sleep quality because pharmaceutical methods have been associated with many adverse effects **(Priya, 2014)**. It is, a hydrotherapeutic technique that adds to warmth helps in muscle relaxation, relieves pain, and dilates blood vessels which enhance blood circulation **(Malarvizhi & R., 2022)**.

Warm water foot bath at home is a simple and practical way that causes less fatigue to the elderly and have an easier time falling asleep **(Anjana & Sharma, 2020)**.

In order to improve the quality of sleep, nurses must be vigilant in identifying and treating sleep problems by using interventions like hot water foot bath therapy. **Arati et al., 2021** stated that warm water foot baths improve sleep at night because they soothe and relax the body and mind.

The purpose of the study is to exhibit the effectiveness of hot water foot bath therapy in enhancing or improving elderly people's sleep quality and preventing them from various sleep disorders. It can be effective in improving elderly sleep quality, and people should be aware of its advantages, which is why the researcher chose this subject for study.

OBJECTIVES OF THE STUDY

1) To assess the pre-test and post-test quality of sleep among elderly in control and experimental group.
2) To evaluate the effectiveness of hot water foot bath therapy on level of quality of sleep among elderly in the experimental group.
3) To compare the post- test quality of sleep among elderly people in Experimental and Control group.
4) To find out the association between pre-test quality of sleep in both control and experimental group with their selected demographic and clinical variables.

ASSUMPTIONS

The therapeutic use of hot water foot bath therapy can improve sleep quality.

- Elderly people and the members of their families might not fully understand the advantages of hot water foot bath therapy on the quality of sleep before bed.
- Hot water foot bath therapy before bedtime may enhance the elderly's ability to sleep.
- Sleep quality may have improved if health-related information about the benefits of hot water foot bath therapy is distributed.

HYPOTHESIS

H1: After hot water foot bath therapy among elderly, there will be an improvement in sleep quality.
H2: There will be a significant difference in post-test mean scores of quality of sleep among the elderly in between experimental and control group at 0.05 level of significance. H3: There will be a significant association between quality of sleep among elderly with their selected demographic and clinical variables.

RESEARCH METHODOLOGY

Part I- Demographic data and Clinical Variable – This part consist of : Age, Gender, Marital Status, Educational Level, Any Comorbidity, Duration of Comorbid condition, Use of any medication for sleep, Measures adopted to cope up with sleep disturbances, Previous knowledge regarding Hot water Foot Bath Therapy

Part II– This part consists of using PSQI Scale via Pen and Paper Personal Interview to evaluate the quality of sleep before and after the intervention

Data Collection Procedure- A quasi-experimental design was adopted to fulfill the purpose of the study. The study was conducted at a selected Old Age Home in Dehradun. A total of 40 participants, 20 each in the experimental and control group were enrolled by convenient sampling technique aged above 60 and fulfilled the selection criteria. Data was collected with the help of the PSQI Scale via Pen and Paper Personal Interview to evaluate the quality of sleep followed by a hot water bath in the evening for 10 days with a duration of 15-20 minutes once a day. A total score of 5 or less indicates good sleep quality, whereas a score of 5 or more indicates poor sleep quality. Analysis of data was done through descriptive and inferential statistics.

Ethical Consideration– Prior to the data collection the investigators had taken written permission from Principal, SGRRIM & HS, College of Nursing. Written and verbal consent was taken from the participants before data collection and confidentially was ensured under all circumstances.

ANALYSIS AND INTERPRETATION

SECTION-A

(Assessment of Demographic Profile)

Sample characteristics of elderly people

In the experimental group, 7(35%) were between the age group of 71 to 80 years. While in the control group, 8 (40%) belong to 61to70 years of age. All 20 (100%) participants were females in both group. A similar number of 8(40%) of the participants were widows in either of the group. 9 (45%) in interventional group and 8 (40%) in control group has completed primary level education

Clinical variables of elderly people in the experimental and control groups.

At the time of data collection, 45% of elderly people were suffering from co-morbidities in the experimental group out of them (15%) had hypertension. In the nonexperimental group, 35% had comorbidities followed by hypertension 20%. Regarding the duration of comorbid conditions, 15(75%) had them for 1to 5years in the experimental group. While in the control group, 70% of elderly people had them for less than 1 year. All (100%) participants in both groups did not use any kind of medication for sleep disturbances. 70% of subjects did not take any measures to reduce sleep disturbances in the experimental group and in the control group, it

was 65%. Only 45% of subjects had previous knowledge about hot water bath therapy in the experimental group and 65% in the control group.

Section – B

(Assessment of pre-test and post-test quality of sleep among elderly in control and experimental group)

Table no. 1: Pre-test and post-test quality of sleep among elderly people in the experimental and control group.

(N=40)

Quality of Sleep	Experimental Group				Control Group			
	Pre-test		Post-test		Pre-test		Post-test	
	F	%	F	%	F	%	F	%
Poor	16	80	1	5	15	75	15	75
Good	4	20	19	95	5	25	5	25

Table no 1 depicts that in the experimental group among 20 subjects most16 (80%) of the participants had poor sleep quality and only 4 (20%) had good sleep quality whereas, in the post-test majority, 19(95%) had good sleep quality followed by poor sleep quality 1 (5%). While in the control group 15(75%) of the participants had poor sleep quality and 5(25%) had good sleep quality which was similar in the post-test also.

Section – C

(Effectiveness of hot water foot bath therapy on level of quality of sleep among elderly in the experimental group)

Table no 2: Effectiveness of warm water foot bath in the experimental group.

(N=20)

Quality of sleep in experimental group	Mean	Standard deviation	Mean difference	't value'	df	P value
Pre-test	8.95	2.277	4.65	10.792	19	.000
Post-test	4.00	0.973				

(p<0.05 significance)

Table no 2 depicts that mean pre-test sleep quality score (8.95±2.277) was higher than the mean post test sleep quality score (4.00±0.973). The calculated' value (t=10.8, p<0.05) was higher than the tabulated value (t_{19}=2, p<0.05). Hence it can be said that the hot water foot bath was effective in improving the quality of sleep among elderly people.

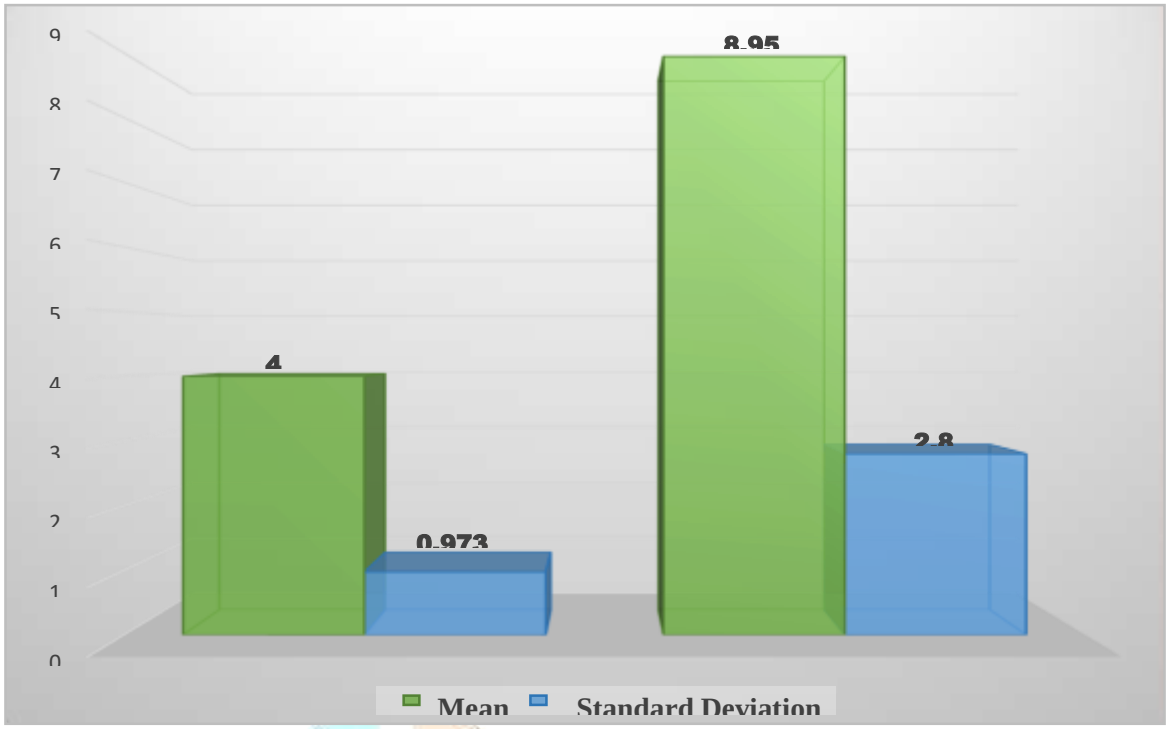

Fig 1: Diagram showing the mean and S.D. of pre-test and post-test quality of sleep regarding hot water foot bath therapy on quality of sleep among elderly people

Section – D

(Comparison of post-test quality of sleep among elderly in experimental and control group)

Table no: 3 Comparison of post-test quality of sleep among elderly betweenexperimental and control groups.

(N = 40)

Quality of sleep	Mean	Standard deviation	Mean difference	't" value	Df	P value
Experimental Group	4.00	0.973	4.95	7.468	38	.000
Control Group	8.95	2.800				

(p<0.05 significance)

Table no 3: depicts the comparison of the mean post-test quality of sleep in experimental and control groups. The control group (8.95±2.80) was higher than the experimental group (4.00±0.97). This implies that there was a significant improvement in the quality of sleep in the experimental group as compared to the control group. (t_{cal}= 7.468), p< 0.05).

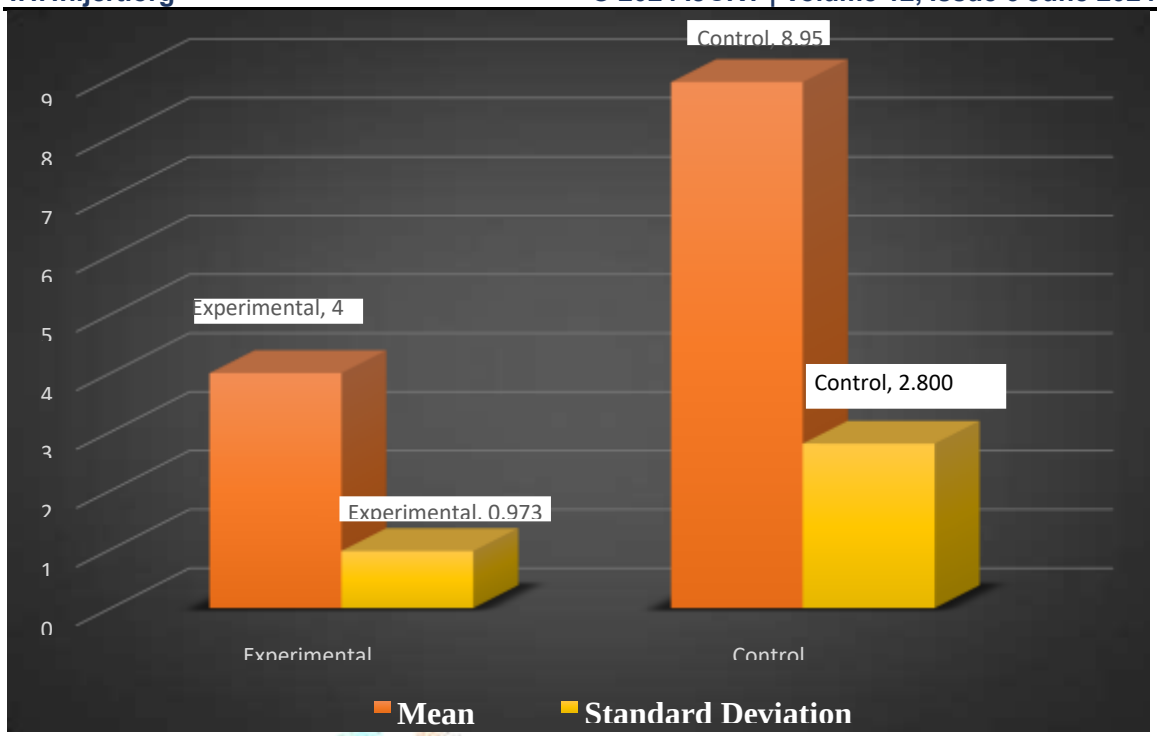

Fig 2: Diagram showing the Comparison mean and S.D. of post-test level quality of sleep among elderly between experimental and control group

Section –E

(Association between pre-test quality of sleep with the selected demographic variables and clinical variable in both experimental and control group)

Association between pre-test quality of sleep scores with selected demographic variables of elderly people in the experimental group.

There was no statistically significant association between the pre-test quality of sleep scores and selected demographic variables such as age, marital status, and educational level.

Association of pre-test quality of sleep score with selected demographicvariables of elderly people in the control group.

There is no statistically significant association between the pretest quality of sleep scores and selected demographic variables such as age, marital status, and educational level.

Association of pre-test quality of sleep scores with the selected clinical variable of elderly people in the experimental group.

The chi – square computed showed that there was significant association between the pre-test quality of sleep scores with clinical variable such as if yes, specify comorbidity ($\chi 2 = 9.773$, $p = 0.044$) which is significant at $p<0.05$ and there was no significant association between the pre-test quality of sleep scores with remaining clinical variables (Any comorbidity, Duration of co-morbid condition, Measures adopted to cope with sleep disturbances, If yes; specify measures, Previous knowledge regarding hot water foot bath therapy, If yes; specify the source of knowledge).

Association of pre-test quality of sleep scores with the selected clinical variable of elderly people in the control group.

There is no statistically significant association between the pretest quality of sleep scores and other clinical variables (Any comorbidity, If yes; specify co-morbidity, Duration of co-morbid condition, Measures adopted to cope with sleep disturbances, If yes; specify measures, Previous knowledge regarding hot water foot bath therapy, If yes; specify the source of knowledge).

DISCUSSION

The first objective of the study is to assess the pre-test and post-test quality of sleep among elderly in control and experimental group.

In experimental group among 20 subjects the pretest quality of sleep16 (80%) were in poor sleep quality and 4 (20%) were in good sleep quality with pretest mean and standard deviation value are 8.65 and 2.277 respectively where as in post-test1 (5%) were in poor sleep quality and 19 (95%) were in good sleep quality with pretest mean and standard deviation value are4.00 and 0.973 respectively. In control group among 20 subjects the pretest quality of sleep15 (75%) were in poor sleep quality and 5 (25%) were in good sleep quality with pretest mean and standard deviation value are 9.00 and 2.772 respectively where as in post-test 15 (75%) were in poor sleep quality and 5 (25%) were in good sleep quality with posttest mean and standard deviation value are 8.95 and 2.800 respectively. This result comes in accordance with **(Malarvizhi & R., 2019)** who stated that in the experimental group pre-test quality of sleep among 30 samples; 16 (53.3%) had poor sleep, 10 (33.3%) had disturbed sleep and 4 (13.3%) had good sleep. In post-test among 30 samples; 6 (20%) had poor sleep, 7 (23.3%) had disturbed sleep and 17 (56.7%) had good sleep. The pre-test mean is 9.6 and the standard deviation was 3.3. The post-test mean was 6.13 and the standard deviation was 3.45. Similarly in the control group, pre-test quality of sleep among 30 samples 18 (60%) had poor sleep, 7 (23.35) had disturbed sleep and 5 (16.7%) had good sleep. In post-test among 30 samples 14 (46.75) had poor sleep, 9 (30%) had disturbed sleep and 7 (23.3) had good sleep. the pre-test mean was 9.57 and the standard deviation was 3.37. The post-test mean was 8.8 and the standard deviation was 3.69.

The second objective is to evaluate the effectiveness of hot water foot bath therapy on level of quality of sleep among elderly in the experimental group.

The experimental group pre-test mean and standard deviation values were 8.65 and 2.277 respectively. The post-test mean and standard deviation values were 4.00 and 0.973 respectively; mean difference between pre-test and post-test was 4.65; paired 't' test value of experimental group were 10.792 and two – tailed 'p'value were less than 0.0001 which is highly significant at $p< 0.05$; Hence it indicates that there is improvement in sleep after hot water foot bath therapy among the elderly.

Hence, hypothesis H1 is accepted.

This result comes in line with **(Arati et al., 2021)** who studied "Effectiveness of Warm Water Foot Bath Therapy on Quality of Sleep among Elderly" and reported that mean value of pre-existing sleeping quality (8.93) and standard deviation value (0.828) whereas, mean value of post- score of sleep quality (4.23). The calculated t-value (14.75) and p-value (0.000) which is statistically interpreted that the effectiveness of footbath therapy among elderly was effective.

The third objective is to compare the post- test quality of sleep among elderly in both Experimental and Control group.

In experimental group post-test mean and standard deviation values were 4.00 and 0.97 respectively and in control group post-test mean and standard deviation values were 8.95 and 2.80 respectively; mean difference between experimental group and control group was 4.95; unpaired 't'test value were 7.468 and two – tailed 'p'value was less than 0.0001 which is highly significant at $p< 0.05$). Hence it indicates that there is significant difference in post-test mean scores of quality of sleep among the elderly in experimental and control group at 0.05 level of significance.

Hence, hypothesis H2 is accepted.

This result comes in accordance with **(Das & Yembem, 2021)** who studied "A study to assess the effectiveness of hot water foot bath therapy on quality of sleep among the elderly in a selected old age home, Agartala, Tripura West" and reports that on comparison between post test score in experimental group and control group revealed that there was significant increase in quality of sleep in experimental group as compared to control group ($t_{cal}= 5.09$, $p< 0.05$)

The fourth objective is to find out the association between pre-test and post-test quality of sleep scores among elderly with their selected sociodemographic variable and clinical variable in experimental and control group.

The chi – square computed showed that there was significant association between the pre-test quality of sleep scores with clinical variable such as if yes, specify comorbidity ($\chi 2 = 9.773$,

$p = 0.044$) which is significant at $p<0.05$ and there was no significant association between the pre-test and post-test quality of sleep scores with remaining demographic and clinical variables.

CONCLUSION

The study concludes that the majority of the participants have poor sleep quality and the hot water foot bath was found to be effective in improving the sleep quality of the elders. Therefore, healthcare providers must be aware of and demonstrate the procedure of hot water foot baths to elderly people so that sleep disorders can be prevented among them.

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