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RESEARCH ARTICLE

EFFECTIVENESS OF WARM WATER FOOTBATH ON QUALITY OF SLEEP AMONG CANCER PATIENTS

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Abstract

Cancer is a major health problem worldwide and is often associated with sleep disturbances that negatively affect patients' quality of life. Warm water footbath is a simple, non-pharmacological intervention that may promote relaxation and improve sleep quality among cancer patients. Therefore, the aim of the present study is to assess the effectiveness of warm water footbath on quality of sleep among cancer patients. A quantitative research approach with a quasi-experimental non-randomized pre-test and post-test control group design was done and the study was conducted at Mizoram State Cancer Institute (MSCI), Aizawl, Mizoram. Using a non-probability purposive sampling technique, 60 cancer patients were selected and allocated into an experimental group (n=30) and a control group (n=30). The Groningen Sleep Quality Scale was used to assess sleep quality. The experimental group received warm water footbath therapy at 39°C–43°C for 15 minutes twice daily for five consecutive days, whereas the control group received routine care. Descriptive and inferential statistics were used for data analysis. The findings revealed that the mean post-test sleep quality score (5.90 ± 2.17) of the experimental group was lower than the mean pre-test score (7.67 ± 2.64), indicating improvement in sleep quality and the difference was found to be statistically significant ($P < 0.05$). A significant difference was also observed between the post-test sleep quality scores of the experimental and control groups, demonstrating the effectiveness of warm water footbath therapy. The study concluded that warm water footbath therapy is an effective, safe, simple, and cost-effective nursing intervention for improving the quality of sleep among cancer patients.

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Introduction:-

Cancer is one of the leading public health problems worldwide because of its increasing incidence, high mortality, and substantial impact on quality of life. Globally, approximately 20 million new cancer cases and 9.7 million cancer-related deaths were reported in 2022, making cancer a major cause of morbidity and mortality worldwide. In India, the burden of cancer continues to rise, with the northeastern region, particularly Mizoram, reporting some of the highest incidence rates in the country. According to the National Cancer Registry Programme, Aizawl district records the highest age-adjusted cancer incidence rate in India (Malsawmdawngkimiet al., 2025). Advances in cancer

treatment, including surgery, chemotherapy, radiotherapy, immunotherapy, and targeted therapy, have significantly improved survival rates. However, these treatments are often associated with various physical and psychological side effects that adversely affect patients' quality of life (Yarbro et al., 2018). Among these symptoms, sleep disturbance is one of the most common and distressing problems experienced by cancer patients, affecting nearly 60.7% of individuals (Vijayalaxmi & Ullas, 2024).

Sleep is essential for physical restoration, immune function, cognitive performance, and emotional well-being (Watson et al., 2015). However, cancer patients frequently experience sleep disturbances due to disease-related symptoms, treatment side effects, pain, fatigue, anxiety, and psychological distress (Murugan, 2022). Persistent sleep problems may lead to depression, impaired concentration, daytime dysfunction, reduced coping ability, and poor quality of life. Studies have also demonstrated a significant association between poor sleep quality, increased fatigue, and reduced overall well-being among cancer patients (Al Maqbali et al., 2022). Although pharmacological interventions are commonly used to manage sleep disturbances, their long-term use may be associated with adverse effects and inadequate improvement in sleep quality (Nishiura et al., 2015). Consequently, there is increasing interest in safe and cost-effective non-pharmacological interventions that can be integrated into routine supportive cancer care.

Warm water footbath therapy is a simple, inexpensive, and non-invasive intervention that promotes relaxation and comfort. Immersion of the feet in warm water improves peripheral circulation, reduces muscle tension, enhances parasympathetic activity, and facilitates sleep through thermoregulatory mechanisms (Chauhan & George, 2019; Wickman, 2014). Previous studies have reported that warm water footbath therapy can effectively improve sleep quality and reduce fatigue among patients undergoing cancer treatment (Yang et al., 2010; Vijayalaxmi & Ullas, 2024). Despite these potential benefits, evidence regarding the effectiveness of warm water footbath therapy among cancer patients remains limited, particularly in Indian oncology settings. Therefore, the present study aimed to assess the effectiveness of warm water footbath on quality of sleep among cancer patients.

Materials and Methods:-

In this evaluative study, Janet W. Kenny's Open System Model was used for framing the conceptual framework in order to assess the effectiveness of warm water footbath on quality of sleep among cancer patients. The study employed a quantitative approach with a quasi-experimental pre-test post-test control group design and was carried out at the Mizoram State Cancer Institute (MSCI), Zembawak, Aizawl, Mizoram, a tertiary cancer care centre providing comprehensive oncology services in the state. The research involved cancer patients receiving treatment at MSCI who were experiencing sleep disturbances. A non-probability purposive sampling technique was used to select participants, and the final sample consisted of 60 cancer patients, with 30 participants in the experimental group and 30 participants in the control group. Data were collected using a structured socio-demographic and clinical proforma and the Groningen Sleep Quality Scale (GSQS). The experimental group received warm water footbath therapy at a temperature of 39°C–43°C for 15 minutes twice daily for five consecutive days, while the control group received routine care. Descriptive and inferential statistics were used for data analysis.

Tools for data collection:-

Tool I: Section A – Socio-demographic proforma; Section B – Clinical proforma.

Tool II: Groningen Sleep Quality Scale (GSQS).

Tool I: Socio-demographic and Clinical Proforma

The socio-demographic proforma was developed by the investigator to collect baseline information regarding the participants. Section A consisted of demographic variables such as age, gender, religion, educational status, marital status, occupation, and family income. Section B included clinical variables such as duration of illness, stage of cancer, type of treatment received, history of co-morbid illness, family history of cancer, history of sleep disturbance, usual sleeping techniques used at home, and factors influencing sleep. Tool II: Groningen Sleep Quality Scale (GSQS) The Groningen Sleep Quality Scale (GSQS), developed by Mulder-Hajonides van der Meulen et al. (1980), was used to assess the quality of sleep among cancer patients. The scale consists of 15 dichotomous items with responses of "Yes" or "No," of which the first item is not included in the scoring. The total score ranges from 0 to 14, with higher scores indicating poorer subjective sleep quality.

The scores were interpreted as follows:-

- Score 0–5: Undisturbed sleep
- Score 6–8: Disturbed sleep
- Score 9–14: Poor sleep quality

Content Validity and Reliability of the Tool:-

Content validity of the study tools was established by a panel of seven experts from the fields of Medical-Surgical Nursing, Oncology, and related disciplines. The experts reviewed the tools for relevance, clarity, adequacy, and appropriateness in relation to the study objectives. Necessary modifications were made based on their suggestions before finalization of the instruments. The Groningen Sleep Quality Scale (GSQS) is a standardized instrument developed by Mulder-Hajonides van der Meulen et al. (1980) for assessing subjective sleep quality. Previous studies have reported satisfactory psychometric properties of the scale, with a validity coefficient of 0.82 and split-half reliability coefficients of 0.65 and 0.60, indicating that the instrument is valid and reliable for assessing sleep quality (Gayathri, 2019).

Ethical consideration:-

Ethical clearance for the study was obtained from the Institutional Ethics Committee of the Regional Institute of Paramedical and Nursing Sciences (RIPANS), Aizawl. Administrative approval to conduct the study at Mizoram State Cancer Institute (MSCI), Zembawak, Aizawl, was obtained from the Director of Health and Medical Education, Directorate of Health and Family Welfare, Government of Mizoram, as well as from the concerned authorities of MSCI. Written informed consent was obtained from all participants after explaining the purpose and procedures of the study. Participation was voluntary, and participants were informed of their right to withdraw from the study at any stage without any penalty. Strict confidentiality, privacy, and anonymity of the participants were maintained throughout the research process.

Data collection procedure:-

On the first day, socio-demographic and clinical data were collected from the participants, followed by a pre-test assessment of sleep quality using the Groningen Sleep Quality Scale (GSQS) for both the experimental and control groups. The participants in the experimental group then received warm water footbath therapy at a temperature of 39°C–43°C for 15 minutes twice daily (morning and evening) for five consecutive days, whereas the control group received routine care only. On the sixth day, post-test assessment of sleep quality was carried out using the same Groningen Sleep Quality Scale. The data collected through the study tools were analysed according to the objectives and hypotheses of the study using both descriptive and inferential statistical methods.

Results:-**Section I: Description of Sample Characteristics:-**

The sample characteristics were divided into two parts: demographic characteristics and clinical characteristics of cancer patients. Descriptive statistics such as frequency and percentage distribution were computed to describe the sample characteristics.

Part A: Description of Demographic Characteristics of the Patients:-

The demographic variables of cancer patients are described in terms of age, gender, religion, educational status, marital status, occupation, and monthly family income. Frequency and percentage distribution were computed for describing the demographic variables and characteristics as shown in Table 4.1.

Table1: Frequency and percentage distribution of the demographic variables of cancer patients in Experimental and control Group n=60

Sl. No	Demographic variables	Experimental group (n=30)		Control Group (n=30)	
		f	%	f	%
1	Age in years				
	a. 18-32 years	1	3.3	3	10
	b. 33-47 years	6	20	5	16.7
	c. 48-62 years	12	40	9	30

	d. 63-77 years	9	30	11	36.7
	e. Above 78 years	2	6.7	2	6.7
2	Gender				
	a. Male	16	53.3	16	53.3
	b. Female	14	46.7	14	46.7
3	Religion				
	a. Hindu	0	0	0	0
	b. Christian	27	90	26	86.7
	c. Muslim	0	0	0	0
	d. Others	3	10	4	13.3
4	Educational status				
	a. No formal education	10	33.4	8	26.7
	b. Primary school	7	23.3	10	33.3
	c. High school	7	23.3	6	20
	d. Higher secondary	4	13.3	4	13.3
	e. Graduate and above	2	6.7	2	6.7
5	Family income (per month in Rs)				
	a. Below 5,000	0	0	0	0
	b. 5,000 – 10,000	9	30	8	26.6
	c. 10,000 – 15,000	9	30	11	36.7
	d. Above 15,000	12	40	11	36.7
6	Marital status				
	a. Married	21	70	15	50
	b. Unmarried	2	6.7	7	23.3
	c. Divorced/ separated	3	10	1	3.4
	d. Widower	4	13.3	7	23.3
7	Occupation				
	a. Government service	6	20	2	6.7
	b. Business/self employed	9	30	3	10
	c. Daily wages worker	8	26.7	5	16.7
	d. Unemployed	7	23.3	20	66.6

f-frequency; %-percentage

Table 1 shows the demographic characteristics of the participants. The majority of participants in both groups were male, Christians, married, and had a monthly family income of ₹10,000 and above. The demographic profile of the experimental and control groups was generally comparable.

Part B: Description of Clinical Characteristics of the Patients:-

The clinical variables of cancer patients are described in terms of duration of illness, stage of cancer, type of treatment, presence of co-morbid illness, family history of cancer, and history of sleep disturbance. Frequency and percentage distribution were computed to describe the clinical characteristics as shown in Table 4.2

Table 2:Frequency and percentage distribution of the clinical variables of cancer patients in Experimental and control Group n=60

Sl. No	Clinical variables	Experimental group (n=30)		Control Group (n=30)	
		f	%	f	%

8	Duration of the illness				
	a) Less than 1 year	20	66.7	19	63.3
	b) 1-3 years	7	23.3	6	20
	c) > 3 years	3	10	5	16.7
9	Stage of cancer				
	a) Stage I	2	6.7	2	6.7
	b) Stage II	4	13.3	2	6.7
	c) Stage III	7	23.3	5	16.6
	d) Stage IV	2	6.7	3	10
	e) Not documented	15	50	18	60
10	Treatment				
	a) Chemotherapy	16	53.3	16	53.3
	b) Radiation therapy	3	10	5	16.7
	c) Surgery	5	16.7	4	13.3
	d) Palliative care	4	13.3	3	10
	e) Any other, specify	2	6.7	2	6.7
11	History of co-morbid condition				
	a) No comorbid condition	12	40	16	53.4
	b) Hypertension	3	10	6	20
	c) Diabetes mellitus	6	20	4	13.3
	d) Both hypertension and diabetes mellitus	4	13.3	3	10
	e) Others	5	16.7	1	3.3
12	Family history of cancer				
	a) Yes	16	53.4	10	33.3
	b) No	14	46.7	20	66.7
13	History of sleep disturbance				
	a) Difficulty falling asleep	16	53.4	13	43.3
	b) Waking up frequently during the night	9	30	11	36.7
	c) Feeling tired or unrefreshed after sleep	1	3.3	3	10
	d) Difficulty returning to sleep following night time awakening	4	13.3	3	10
14	Techniques used for sleeping usually at home				
	a) Music	5	16.7	6	20
	b) Reading	9	30	7	23.3
	c) Meditation	3	10	7	23.3
	d) Any other, Specify	13	43.3	10	33.4
15	Factors influencing sleeping				
	a) Pain	12	40	10	33.3
	b) Stress	7	23.3	4	13.3
	c) Noise	5	16.7	5	16.7
	d) Light	5	16.7	9	30
	e) Others, specify	1	3.3	2	6.7

f-frequency; %- percentage

Table 2 shows the clinical characteristics of the participants. The majority of patients in both groups had a duration of illness of less than one year, were receiving chemotherapy, and reported difficulty in falling asleep. Pain was the most commonly reported factor affecting sleep. The clinical profile of the two groups was generally comparable.

Section II: Description of Pre-test and Post-test Quality of Sleep Scores Among Cancer Patients:-

The percentage distribution of pre-test and post-test quality of sleep scores among cancer patients in the experimental and control groups is shown in Figure 4.3

Table 3: Distribution of pre-test -test level of quality of sleep among Cancer patients in experimental and control group n=60

Pre-test level of quality of sleep	Experimental Group n=30		Control Group n=30	
	f	%	f	%
Undisturbed or Unrestricted Sleep Last Night (0-5)	5	16.7	7	23.3
Disturbed Sleep Last Night (6-8)	14	46.6	13	43.4
Indicating Poor Sleep the Night Before (9-14)	11	36.7	10	33.3

f-frequency; %- percentage

Table 3 shows the pre-test level of sleep quality among cancer patients in the experimental and control groups. The majority of participants in both groups reported disturbed or poor sleep quality before the intervention, indicating a high prevalence of sleep disturbances at baseline.

Table 4: Distribution of post-test -test level of quality of sleep among Cancer patients in experimental and control group n=60

Post-test level of quality of sleep	Experimental Group n=30		Control Group n=30	
	f	%	f	%
Undisturbed or Unrestricted Sleep Last Night (0-5)	16	53.4	8	26.6
Disturbed Sleep Last Night (6-8)	10	33.3	11	36.7
Indicating Poor Sleep the Night Before (9-14)	4	13.3	11	36.7

f-frequency; %- percentage

Table 4 shows the post-test level of sleep quality among cancer patients in the experimental and control groups. A higher proportion of participants in the experimental group reported undisturbed sleep compared to the control group, indicating improved sleep quality following warm water footbath therapy.

Section III: Effectiveness of Warm Water Footbath on Quality of Sleep Among Cancer Patients:-

In order to determine the effectiveness of warm water footbath on quality of sleep among cancer patients, paired and unpaired 't' tests were calculated and the findings are presented in Tables 5 and 6.

Table 5: Effectiveness of warm water footbath on the quality of sleep among cancer patients in experimental group n=30

Variables	Comparison	Mean	SD	Mean D	t value	df	p value
Experimental group	Pre-test	7.67	2.64	1.87	14.0	29	0.019*
	Post-test	5.90	2.17				

*P<0.05 level of significance SD- Standard deviation, mean D- mean difference, df-degree of freedom.

Table 5 shows the effectiveness of warm water footbath on sleep quality among cancer patients in the experimental group. A significant reduction in the mean sleep quality score was observed from pre-test to post-test (t=14.0, p<0.05), indicating that warm water footbath was effective in improving sleep quality among cancer patients.

Table 6: Effectiveness of warm water footbath on the quality of sleep among cancer patients in experimental and control group n=60

Variables	Comparison/ Group	Mean	SD	Mean D	t value	df	p value
Pre-test	Experimental	7.67	2.64	0.27	0.388	58	0.699
	Control	7.50	2.67				
Post-test	Experimental	5.90	2.17	1.50	2.458	58	0.017*
	Control	7.40	2.54				

*P<0.05 level of significance;SD- Standard deviation;Mean D- mean difference;df-degree of freedom

Table 6 compares the sleep quality scores between the experimental and control groups. No significant difference was observed between the groups during the pre-test ($p>0.05$), indicating baseline comparability. However, a statistically significant difference was found in the post-test scores ($t=2.458$, $p=0.017$), with the experimental group showing better sleep quality than the control group following the intervention.

Section IV: Association Between Post-test Quality of Sleep Scores and Selected Demographic and Clinical Variables:-

The association between post-test quality of sleep scores and selected demographic and clinical variables was analysed using Chi-square test and the findings are presented in Table 7 and 8.

Table 7: Association between pre-test quality of sleep among Cancer patients with selected demographic variables in experimental group n=30

Demographic variables	Quality of sleep			χ^2 value	df	P value
	Undisturbed sleep	Disturbed sleep	Poor sleep			
Age in years						
a. 18-32 years	0	0	1	6.277	8	0.697
b. 33-47 years	1	2	3			
c. 48-62 years	1	6	5			
d. 63-77 years	2	1	2			
e. Above 78 years	1	14	0			
Gender						
a. Male	2	9	5	1.371	2	0.554
b. Female	3	5	6			
Religion						
a. Hindu	0	0	0	1.220	2	0.753
b. Christian	4	13	10			
c. Muslim	0	0	0			
d. Others	1	1	1			
Educational status						
a. No formal education	1	4	5			0.361
b. Primary school	2	2	3			
c. High school	0	5	1			
d. Higher secondary	2	2	0			
e. Graduate and above	0	1	1			
Family income (per month in Rs)						
a. Below 5,000	0	0	0	2.622	4	0.677
b. 5,000 – 10,000	1	5	3			
c. 10,000 – 15,000	1	3	5			
d. Above 15,000	3	6	3			
Marital status						
a) Married	3	11	7	4.681	6	0.622
b) Unmarried	0	1	1			

c) Divorced/ separated	1	0	2			
d) Widower	1	2	1			
Occupation						
a. Government service	2	3	1	5.523	6	0.511
b. Business/self employed	2	5	2			
c. Daily wadges worker	0	4	4			
d. Unemployed	1	2	4			
Duration of the illness						
a. Less than 1 year	5	11	4	7.993	4	0.045*
b. 1-3 years	0	3	4			
c. > 3 years	0	0	3			
Stage of cancer						
a. Stage I	1	1	0	16.34	8	0.005*
b. Stage II	2	2	0			
c. Stage III	0	1	6			
d. Stage IV	0	0	2			
e. Not documented	2	10	3			
Treatment						
a. Chemotherapy	3	9	4	8.801	8	0.275
b. Radiation therapy	0	2	1			
c. Surgery	1	1	3			
d. Palliative care	1	0	3			
e. Any other, specify	0	2	0			
History of co-morbid condition						
a. No comorbid condition	2	6	4	3.520	8	0.982
b. Hypertension	0	2	1			
c. Diabetes mellitus	1	3	2			
d. Both hypertension and diabetes mellitus	1	2	1			
e. Others	1	1	3			
Family history of cancer						
a. Yes	1	6	9	6.203	2	0.041*
b. No	4	8	2			
History of sleep disturbance						
a. Difficulty falling asleep	3	10	3	9.843	6	0.067
b. Waking up frequently during the night	2	4	3			
c. Feeling tired or unrefreshed after sleep	0	0	2			
d. Difficulty returning to sleep following night time awakening	2	0	4			
Techniques used for sleeping usually at home						
a. Music						
b. Reading	0	2	3	2.774	6	0.918
c. Meditation	2	4	3			
d. Any other, Specify	0	2	1			
	3	6	4			
Factors influencing sleeping						
a. Pain	1	4	7	11.31	8	0.110
b. Stress	2	3	2			
c. Noise	2	1	2			
d. Light	0	5	0			
e. Others, specify	0	1	0			

*p<0.05 level of significance; χ^2 - Chi square; df- Degree of Freedom

Table 7 shows the association between pre-test sleep quality and selected demographic and clinical variables among cancer patients. Sleep quality was significantly associated with duration of illness, stage of cancer, and family

history of cancer ($p < 0.05$). No significant association was observed between sleep quality and the remaining demographic and clinical variables ($p > 0.05$).

Table 8: Association between pre-test quality of sleep among Cancer patients with selected demographic variables in control group n=30

Demographic variables	Quality of sleep			χ^2 value	df	P value
	Undisturbed sleep	Disturbed sleep	Poor sleep			
Age in years						
a. 18-32 years	2	1	0	5.080	8	0.865
b. 33-47 years	1	3	1			
c. 48-62 years	2	4	3			
d. 63-77 years	2	4	5			
e. Above 78 years	0	1	1			
Gender						
a. Male	4	6	6	0.583	2	0.896
b. Female	3	7	4			
Religion						
a. Hindu	--	--	--	2.461	2	0.319
b. Christian	6	10	10			
c. Muslim	--	--	--			
d. Others	1	3	0			
Educational status						
a. No formal education	1	5	2	7.976	8	0.420
b. Primary school	2	4	4			
c. High school	1	4	1			
d. Higher secondary	2	0	2			
e. Graduate and above	1	0	1			
Family income (per month in Rs)						
a. Below 5,000	--	--	--	3.601	4	0.491
b. 5,000 – 10,000	3	4	1			
c. 10,000 – 15,000	1	5	5			
d. Above 15,000	3	4	4			
Marital status						
a. Married	2	7	6	9.077	6	0.120
b. Unmarried	3	4	0			
c. Divorced/ separated	0	1	0			
d. Widower	2	1	4			
Occupation						
a. Government service	0	0	2	6.157	6	0.379
b. Business/self employed	0	1	2			
c. Daily wadges worker	1	2	2			
d. Unemployed	6	10	4			
Duration of the illness						
a. Less than 1 year	4	10	5	6.545	4	0.135
b. 1-3 years	0	2	4			
c. > 3 years	3	1	1			
Stage of cancer						
a. Stage I	1	1	0	8.388	8	0.306
b. Stage II	1	1	0			
c. Stage III	1	4	0			
d. Stage IV	0	1	2			
e. Not documented	4	6	8			

Treatment						
a. Chemotherapy	5	8	3	9.556	8	0.215
b. Radiation therapy	1	3	1			
c. Surgery	1	2	1			
d. Palliative care	0	0	3			
e. Any other, specify	0	0	2			
History of co-morbid condition						
a. No comorbid condition	4	8	4	11.51	8	0.076
b. Hypertension	0	3	3			
c. Diabetes mellitus	0	2	2			
d. Both hypertension and diabetes mellitus	3	0	0			
e. Others	0	0	1			
Family history of cancer						
a. Yes	3	4	3	0.526	2	0.787
b. No	4	9	7			
History of sleep disturbance						
a. Difficulty falling asleep	3	8	2	6.996	6	0.276
b. Waking up frequently during the night	3	3	5			
c. Feeling tired or unrefreshed after sleep						
d. Difficulty returning to sleep following night time awakening	2	0	2			
	0	2	1			
Techniques used for sleeping usually at home						
a. Music						
b. Reading	2	3	1	3.882	6	0.777
c. Meditation	2	4	1			
d. Any other, Specify	1	3	3			
	2	3	5			
Factors influencing sleeping						
a. Pain	4	3	3	7.530	8	0.497
b. Stress	1	3	0			
c. Noise	1	2	2			
d. Light	1	3	5			
e. Others, specify	0	2	0			

χ^2 - Chi square; df- Degree of Freedom

Table 8 shows the association between pre-test sleep quality and selected demographic and clinical variables among cancer patients in the control group. No significant association was found between pre-test sleep quality and any of the selected demographic or clinical variables ($p>0.05$).

Discussion:-

The present study was conducted to assess the effectiveness of warm water footbath on quality of sleep among cancer patients. The findings revealed that sleep quality improved significantly among participants in the experimental group following the intervention, whereas no significant improvement was observed in the control group. The post-test mean sleep quality score in the experimental group was significantly lower than the pre-test score, indicating better sleep quality after receiving warm water footbath therapy. These findings support the effectiveness of warm water footbath as a non-pharmacological intervention for improving sleep quality among cancer patients. The findings are consistent with previous studies. Endeshawet al. (2022), Pai et al. (2020), and Santoso et al. (2020) reported a high prevalence of sleep disturbances among cancer patients, emphasizing the need for effective supportive interventions. Similarly, Anju Philip (2016), Kumar et al. (2024), Vijayalaxmi and Ullas (2024), Kumari (2022), and Shindheet al. (2023) reported significant improvements in sleep quality following warm water footbath therapy, supporting the findings of the present study. The beneficial effects of warm water footbath may be attributed to peripheral vasodilation, improved blood circulation, reduction of muscle tension, and activation of the parasympathetic nervous system. These physiological responses promote relaxation, facilitate sleep onset, and improve overall sleep quality. The study also found significant associations between sleep quality and selected

clinical variables, including duration of illness, stage of cancer, and family history of cancer. However, no significant association was observed between sleep quality and most demographic variables. These findings suggest that clinical factors may have a greater influence on sleep quality than socio-demographic characteristics among cancer patients. Overall, the findings demonstrate that warm water footbath is a simple, safe, cost-effective, and effective nursing intervention for improving sleep quality among cancer patients. Incorporating this intervention into routine oncology nursing care may contribute to enhanced patient comfort and improved quality of life.

Conclusion:-

The present study demonstrated that warm water footbath therapy significantly improved the quality of sleep among cancer patients. Patients who received the intervention showed better sleep quality compared to those who received routine care alone. The findings suggest that warm water footbath is a simple, safe, non-invasive, and cost-effective nursing intervention that can be incorporated into routine oncology care to promote relaxation and improve sleep quality among cancer patients.

References:-

1. Anilda, S. J., & Thenmozhi, P. (2013). Effectiveness of hot water foot bath on level of fatigue among elderly patients. *International Journal of Science and Research*, 4(8), 1724–1727. <https://www.ijsr.net/archive/v4i8/SUB157241.pdf>
2. Armat, M. R., Mortazavi, H., Akbari, H., & Ebrahimzadeh, Z. (2021). The effect of footbath on the quality of sleep in older adults: A pilot study. *Geriatric Nursing*, 42(5), 1178–1183. <https://doi.org/10.1016/j.gerinurse.2021.07.008>
3. Berger, A. M., & Mitchell, S. A. (2022). Cancer-related sleep wake disturbances. *Seminars in Oncology Nursing*, 38(1), 151253. <https://doi.org/10.1016/j.soncn.2022.151253>
4. Kabuk, A., Demirel, U., & Inangil, D. (2026). The effectiveness of nursing interventions on fatigue and sleep quality in hospitalized cancer patients: The role of foot massage and bed bath. *Supportive Care in Cancer*, 34(3), 169. <https://doi.org/10.1007/s00520-026-10386-7>
5. Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.
6. Kozier, B., Erb, G., Berman, A., & Burke, K. (2007). *Fundamentals of nursing: Concepts, process, and practice*. Dorling Kindersley.
7. Murugan, M. (2022). Quality of sleep among cancer survivors: A systematic review. *Pondicherry Journal of Nursing*, 15(2), 36–39. <https://doi.org/10.5005/jp-journals-10084-13138>
8. Nasiri, K., et al. (2025). The effect of foot bath on symptom control in cancer patients: A systematic review and meta-analysis. *Advances in Integrative Medicine*, 12(3), 100472. <https://doi.org/10.1016/j.aimed.2025.03.002>
9. Sharma, S. K. (2018). *Nursing research and statistics* (3rd ed.). Elsevier India.
10. Shobana, N. B. (2018). Effectiveness of foot bath therapy in reducing blood pressure among clients with hypertension. *International Journal of Advances in Nursing Management*, 6(1), 72. <https://doi.org/10.5958/2454-2652.2018.00016.1>
11. Vijayalaxmi, V., & Ullas, A. (2024). Effectiveness of warm water foot submerged technique on the level of fatigue, quality of sleep, and quality of life among patients with cancer in selected hospital at Mangaluru. *Journal of Health and Allied Sciences NU*, 14(10).
12. Wood, G. L., & Haber, J. (2018). *Nursing research: Methods and critical appraisal for evidence-based practice* (9th ed.). Elsevier.
13. Yang, H. L., Chen, X. P., Lee, K. C., Fang, F. F., & Chao, Y. F. (2010). The effects of warm-water footbath on relieving fatigue and insomnia of gynecologic cancer patients on chemotherapy. *Cancer Nursing*, 33(6), 454–460.
14. Younis, J. R., et al. (2021). The effect of warm salt water foot bath on the management of chemotherapy-induced fatigue. *European Journal of Oncology Nursing*, 52, 101954. <https://doi.org/10.1016/j.ejon.2021.101954>
15. Zhu, W., Gao, J., Guo, J., Wang, L., & Li, W. (2023). Anxiety, depression, and sleep quality among breast cancer patients in North China: Mediating roles of hope and medical social support. *Supportive Care in Cancer*, 31(9). <https://doi.org/10.1007/s00520-023-07972-4>