

“A study to assess the effectiveness of warm foot bath in promotion of early sleep onset among cancer patients in selected hospitals at Udaipur city, Rajasthan”

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Abstract:

Background: Cancer is a group of diseases characterized by the uncontrolled growth and spread of abnormal cells. If the spread is not controlled, it can result in death. Cancer is caused by both external factors like tobacco usage, infectious organisms, chemicals, radiation and internal factors like inherited mutations, hormones, immune conditions, and mutations that occur from metabolism.¹ Sleep is the basic human need; it is universal biological process common to all the people. Human spend about one third of their lives asleep. We require sleep for more reasons: to cope with daily stresses, to prevent fatigue, to conserve energy, to restore the mind and body, to enjoy life more fully. Sleep can be defined as a normal state of altered consciousness during which the body rests; it is characterized by decreased responsiveness to the environment, and a person can be aroused from it by external stimuli.²

Materials and Methods: In the study 60 samples were selected through purposive sampling technique. Researcher used Quasi-experimental non randomized control group design. Variables under study were warm foot bath as independent variable and sleep quality among cancer patients as dependent variable. Researcher used conceptual framework based on Widenbach's helping art of clinical nursing theory (1964). Data were collected through Groningen Sleep Quality Scale (1980) and data were analyzed through suitable statistical method.

Results: Result revealed that the calculated 'z' value 29.32 was significantly higher than the table value $P = 1.00$ at 0.05 level which was significant. This indicates that there was significant difference between pre-test and post-test in experimental group. Hence, research hypothesis H_1 was accepted. There was significant association between pre-test levels of sleep quality with selected socio-demographic variables. In experimental group such as age in year ($\chi^2 = 12.22$), gender ($\chi^2 = 6.67$), monthly family income ($\chi^2 = 11$), habits ($\chi^2 = 14.24$), type of therapy ($\chi^2 = 11.83$), stage of cancer ($\chi^2 = 13.50$), duration of illness ($\chi^2 = 12$), reason for not getting sleep ($\chi^2 = 16.86$) was significant at 0.05 level and there is no significant association between education, occupation, type of family, type of cancer and technique used for sleep at home regarding quality of sleep at 0.05 level. Hence, research hypothesis H_2 was accepted.

Conclusion: This study concluded that there was improvement in quality of sleep among cancer patients which indicates that the warm foot bath was effective. The socio-demographic variables of cancer patients were significantly associated with the pre-test level of sleep quality score.

Key Word: Effectiveness; Warm Foot Bath; Sleep Quality; Cancer Patients.

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I. Introduction

Cancer is the result of uncontrolled cell growth. Our bodies are composed of trillions of cells, all working together. In cancer, one of those cells stops paying attention to the normal signals that tell cells to grow, stop growing or even to die. The process by which a normal cell changes into one that behaves so abnormally can take a long time and is often triggered by outside influences.³ Quality sleep is an essential element to tissue repair, proper immune function, and mental health. Chronic lack of sleep has been associated with depression, anxiety, and decreased cognitive function. In people with cancer, poor quality of sleep reduces quality of life, but unfortunately, most patients with cancer do not mention sleep problems unless explicitly asked.⁴ Hot water foot bath provides a good sleep, because it relaxes the body and mind. It works by slightly raising the body temperature and after 15 minutes, it starts to drop slowly. This can promote sleep indirectly. Gradual drop of body temperature makes us feel drowsy and therefore we feel more prepared for sleep. A warm footbath also diverts some blood from the head to lower parts of body, reduces brain activity and mimics the pre-sleep state.

A warm-water footbath is a local moist heat application. It is a non-invasive and easy technique to apply at home. The findings provide empirical support that a warm-water footbath relieves fatigue and insomnia problems of 4 patients undergoing chemotherapy. It can be a non-pharmaceutical method to help patients overcome fatigue and sleep problems during chemotherapy.⁵

II. Material And Methods

This experimental study was carried out on traumatic brain injury patients at Geetanjali Medical College & Hospital, Eklingpura and Pacific Medical College & Hospital, Bedla of Udaipur, Rajasthan from 01-03-2021 to 31-03-2021. A total 120 cancer patients with age group between 18-60 years of age were selected for this study.

Study Design: Prospective open label observational study

Study Location: This study was conducted in the Geetanjali Medical College & Hospital, Eklingpura and Pacific Medical College & Hospital, Bedla of Udaipur, Rajasthan.

Study Duration: 01-03-2021 to 31-03-2021.

Sample size: 120 cancer patients with age group between 18-60 years of age.

Population: In the present study the population consist that cancer injury patients from selected hospital of Udaipur.

Sampling Technique: Non probability convenient sampling technique.

Inclusion Criteria:

- Cancer patient with age group between 18 - 60 years.
- Patient who are willing to participate in the study.
- Patient who can able to write and read Hindi and English.

Exclusion Criteria:

- Patient who are having tumors in the leg.
- Patient who are admitted in ICU with severe complications.

Procedure methodology

Ethical clearance was obtained from ethical committee from Geetanjali College of Nursing Ref. No. GCN/2020/1164(C) Date on 22-07-2020. Formal permission was obtained from Geetanjali Medical College & Hospital and Pacific Medical College & Hospital, Bedla, Udaipur. The data was collected from 01-03-2021 to 31-03-2021. Using the non-probability convenient sampling technique, 120 respondents are selected for the study. Out of 120 patients 60 patients from Geetanjali Medical College & Hospital for experimental group were selected for experimental group and 60 patients from Pacific Medical College & Hospital were selected for control group. After obtaining the permission, researcher met the respondent and established rapport with them after ensuring the work and health comforts. A written informed consent was taken separately from each participant. The pre-test was done by using Groningen sleep quality scale to assess the sleep quality in both experimental and control group. After pre-test in experimental group investigator perform the procedure for 15 minutes at bed time for 14 consecutive days. Patient in control group did not receive any intervention other than routine care. The post-test was done by using the same scale. All the samples were cooperated during the data collection.

Statistical analysis: The obtained data were analyzed in terms of objectives of the study using descriptive and inferential statistics. The plan for data analysis was as follows organization of data in master sheet. Obtained data were analyzed in terms of frequencies and percentages. Description Statistics: Description of demographic characteristics mean, median, SD and used to describe the area wise pre-test, post-test in experimental and control group of the participant. Inferential Statistics: ‘t’ test is used to find out the effectiveness of warm foot bath in promotion of early sleep onset among cancer patients in selected hospital of Udaipur. Chi-square is used to find the association between pre-test score of experimental group & control group participant with socio-demographic variables.

III. Result

The collected data was entered in a master sheet for tabulation and statistical processing. The data was analyzed and interpreted using descriptive and inferential statistics based on the objectives and hypothesis formulated for the present study. The findings are presented under the following headings:

PART – I: Frequency and percentage distribution of socio-demographic variables.

Part – II: Assessment of quality of sleep among patients with cancer in the experimental and control group.

SECTION – A: Assessment of quality of sleep among patients with cancer in the experimental group.

SECTION – B: Assessment of quality of sleep among patients with cancer in the control group.

PART – III: Effectiveness of warm footbath in promotion of early sleep onset among cancer patients in both experimental and control groups.

SECTION – A: Comparison of pre-test and post-test effects of warm footbath in promotion of early sleep onset among cancer patients in experimental group.

SECTION – B: Comparison of pre-test and post-test effect of warm footbath in promotion of early sleep onset among cancer patients in control group.

PART - IV: Findings related to association between pre-test level of warm foot bath with their selected socio-demographic variables in experimental and control groups.

SECTION – A: Association between pre-test level of warm foot bath with their selected socio-demographic variables in experimental group.

SECTION – B: Association between pre-test level of warm foot bath with their selected socio-demographic variables in control group.

PART – I: Frequency and percentage distribution of socio-demographic variables: According to the distribution of the participants by **Age in years:** The majority of respondents in experimental group i.e. 40% belonged to age group of 51-60 years, whereas 30% belonged to the age group of 41-50 years, 20% belonged to age group of 31-40 years and 10% belonged to age group of 20-30 years, while in control group majority of respondents i.e. 33% belonged to the age group of 31-40 years, whereas 25%-25% belonged to age group of 31-40 years or 51-60 years, and 17% belonged to age group of 20-30 years. **Gender:** The majority of respondents in experimental group i.e. 50% - 50% were males or females, while in control group majority of respondents i.e. 60% were males, whereas 40% were females. **Education:** The majority of the respondents in experimental group i.e. 45% belonged to non-formal education, whereas 30% belonged to secondary education, 25% belonged to sr. secondary education, and 0% belonged to graduation & above, while in control group majority of the respondents i.e. 58% belonged to non-formal education, whereas 25% belonged to secondary education, 17% belonged to sr. secondary education, and 0% belonged to graduation & above. **Monthly family income:** The majority of the respondents in experimental group i.e. 45% belonged to 10k & below, whereas 35% belonged to 10k-20k, 20% were belonged from 20k-30k, and 0% belonged from 30k & above, while in control group majority of the respondents i.e. 33% belonged to 10k & below, whereas 25% belonged to 10k-20k or 20k-30k, and 17% belonged from 30k & above. **Occupation:** The majority of respondents in experimental group i.e. 40% were housewife, 20% were private employee, 15%-15% were unemployed and farmer, 10% were in business, and 0% were govt. employee, while in control group majority of respondents i.e. 40% were housewife, 25% were private employee, 17% were in business, 10% were farmer, and 8% were unemployed, and 0% were govt. employee. **Type of family:** The majority of respondents in both experimental or control group i.e. 60% was belonged to joint family, and 40% were belonged to nuclear family. **Habit:** The majority of respondents in experimental group i.e. 50% were belonged from none, 20% were consuming tobacco, 15%-15% were smoking or consuming alcohol, and 0% were from other habit, while in control group majority of respondents i.e. 30% were belonged to smoking habit, 25%-25% were consuming alcohol or tobacco, 20% were belonged from none, and 0% were from other habit. **Type of cancer:** The majority of the respondents in experimental group i.e. 30% were belonged to lung cancer, whereas 25%-25% were belonged to oral or breast cancer, and 20% were belonged from other type of cancer, while in control group majority of the respondents i.e. 45% were belonged to other type of cancer, whereas 25% were belonged to breast cancer, and 15%-15% were belonged to lung or oral cancer. **Type of therapy:** The majority of respondents in experimental group i.e. 40% were treated with chemotherapy, 35% were treated with chemotherapy + radiotherapy, 25% were treated with radiotherapy, and 0%-0% were treated with chemo + radio + surgery or radiotherapy + surgery, while in control group majority of respondents i.e. 33% were treated with chemotherapy + radiotherapy, 25%-25% were treated with chemotherapy or radiotherapy, 17% were treated with chemo + radio + surgery, and 0% were treated with radiotherapy + surgery. **Stage of cancer:** The majority of the respondents in experimental group i.e. 40% belonged to stage-II, whereas 30% belonged to stage-I, and 15%-15% belonged to stage-IV, while in control group majority of the respondents i.e. 33% belonged to stage-II, whereas 25%-25% belonged to stage-I or stage-IV, and 17% belonged to stage-III. **Duration of illness:** The majority of respondents in experimental group i.e. 40%-40% were belonged to <6 months or 6-12 months, and 20% were belonged to 1 year and above, while in control group majority of respondents i.e. 50% were belonged to <6 months, and 25%-25% were belonged to 6-12 months or 1 year and above. **Technique used for sleep at home:** The majority of the respondents in experimental group i.e. 50% belonged to watching TV, whereas 35% belonged to other, 15% belonged to reading, and 0% belonged to music, while in control group majority of the respondents i.e. 50% belonged to watching TV, whereas 25%-25% belonged to reading or other, and 0% belonged to music. **Reason for not getting sleep:** The majority of respondents in experimental group i.e. 45% had pain, 25% had stress, 15%-15% had nausea or vomiting, and 0%-0% were belonged to noise, light or other reason, while in control group

majority of respondents i.e. 40% had pain, 20%-20% were belonged to stress, nausea or vomiting, and 0%-0% belonged to noise, light or other reason.

Part – II: Assessment of quality of sleep among patients with cancer in the experimental and control group.

SECTION – A: Assessment of quality of sleep among patients with cancer in the experimental group.

Table-1: Frequency and percentage distribution of quality of sleep

N = 60

Experimental Group				
Test	Sleep Quality	Score	Frequency (60)	Percentage (%)
Pre-Test	Good Sleep	0-5	0	0.00
	Disturbed Sleep	6-7	0	0.00
	Poor Sleep	8-14	60	100.00
Post-Test	Good Sleep	0-5	33	55.00
	Disturbed Sleep	6-7	25	41.67
	Poor Sleep	8-14	2	3.33

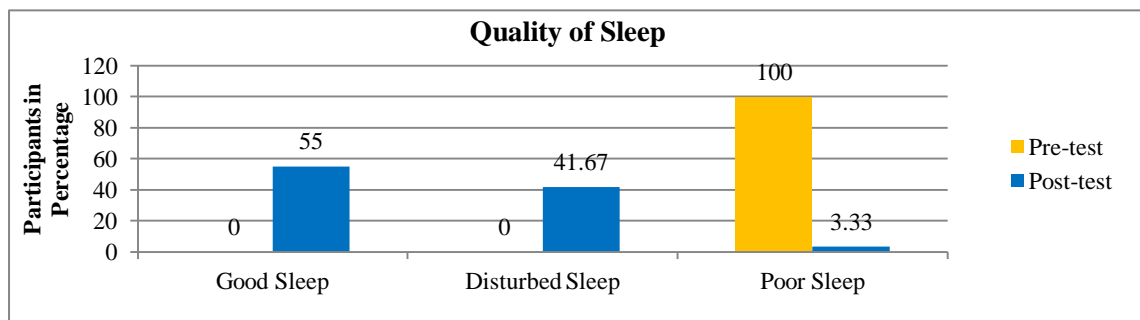


Figure-1: Frequency and percentage distribution of quality of sleep

Table-1 & Figure-1: Depicted the pre-test and quality of sleep with cancer in experimental group. The result showed that in pre-test none of the respondents had good sleep or in disturbed sleep, and 100% had poor sleep while in post-test 55% had good sleep whereas 41.67% had disturbed sleep, and 3.33% had poor sleep with cancer.

SECTION – B: Assessment of quality of sleep among patients with cancer in the control group.

Table-2: Frequency and percentage distribution of quality of sleep

N = 60

Control Group				
Test	Sleep Quality	Score	Frequency (60)	Percentage (%)
Pre-Test	Good Sleep	0-5	0	0.00
	Disturbed Sleep	6-7	0	0.00
	Poor Sleep	8-14	60	100.0
Post-Test	Good Sleep	0-5	0	0.00
	Disturbed Sleep	6-7	0	0.00
	Poor Sleep	8-14	60	100.0

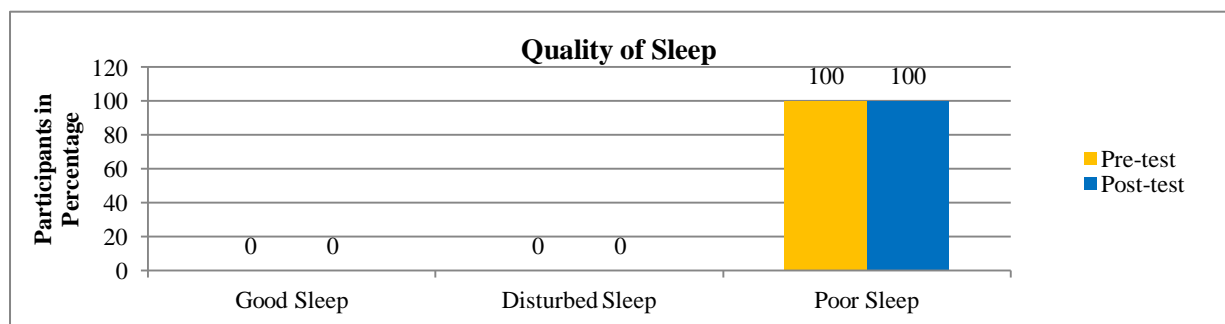


Figure-2: Frequency and percentage distribution of quality of sleep

Table-2 & Figure-2: Depicted the pre-test and quality of sleep with cancer in control group. The result showed that in pre-test none of the respondents had good sleep or disturbed sleep, and 100% had poor sleep while in post-test also none of the respondents had good sleep or disturbed sleep, and 100% had poor sleep with cancer.

PART – III: Effectiveness of warm footbath in promotion of early sleep onset among cancer patients in both experimental and control groups

SECTION – A: Comparison of pre-test and post-test effects of warm footbath in promotion of early sleep onset among cancer patients in experimental group.

Table-3: Comparison of pre-test and post-test effects of warm footbath in promotion of early sleep onset

N = 60

Test	Experimental Group							Inference (P Value)
	Mean	Mean (%)	S.D.	Mean Difference	Mean Difference (%)	df	Z-Value	
Pre-Test	12.38	82.56	1.44	6.96	46.45	59	29.32	S (1.00)
Post-Test	5.42	36.11	1.28					

S= Significant

Table-3: Revealed that in experimental group the effectiveness of warm foot bath from pre-test to post-test the mean was 12.38 to 5.42, SD was 1.44 to 1.28 mean percentages was 82.56% to 36.11%. The mean difference percentage was 46.45%. The data further represents that the ‘z’ value 29.32 was significantly higher than the table value P = 1.00 at 0.05 level which was significant. This indicates that there is difference in pre-test and post-test quality of sleep score of the respondents and warm foot bath intervention was effective among cancer patients. Hence research hypothesis **H₁** is accepted.

SECTION – B: Comparison of pre-test and post-test effect of warm footbath in promotion of early sleep onset among cancer patients in control group.

Table-4: Comparison of pre-test and post-test effect of warm footbath in promotion of early sleep onset

N = 60

Test	Control Group							Inference (P Value)
	Mean	Mean (%)	S.D.	Mean Difference	Mean Difference (%)	df	Z-Value	
Pre-Test	12.72	84.78	1.32	0.15	1	59	0.63	NS (0.7354)
Post-Test	12.57	83.78	1.29					

NS= Non Significant

Table-4: Revealed that in control group the effectiveness of warm foot bath from pre-test to post-test the mean was 12.72 to 12.57, SD was 1.32 to 1.29 mean percentages was 84.78% to 83.78%. The mean difference percentage was 1%. The data further represents that the ‘z’ value 0.63 was significantly lesser than the table value P=0.7354 which was non-significant. This indicates that there was difference in pre-test and post-test quality of sleep level of the respondents was non-significant among cancer patients. Hence, research hypothesis **H₁** was accepted.

PART - IV: Findings related to association between pre-test level of warm foot bath with their selected socio-demographic variables in experimental and control groups.

SECTION – A: Association between pre-test level of warm foot bath with their selected socio-demographic variables in experimental group.

In experimental group there was significant association between pre-test quality of sleep score with selected socio-demographic variables. In experimental group such as age in year ($\chi^2 = 12.22$), gender ($\chi^2 = 6.67$), monthly family income ($\chi^2 = 11$), habits ($\chi^2 = 14.24$), type of therapy ($\chi^2 = 11.83$), stage of cancer ($\chi^2 = 13.50$), duration of illness ($\chi^2 = 12$), reason for not getting sleep ($\chi^2 = 16.86$) was significant at 0.05 level and there is no significant association between education, occupation, type of family, type of cancer and technique used for sleep at home regarding quality of sleep at 0.05 level.

SECTION – B: Association between pre-test level of warm foot bath with their selected socio-demographic variables in control group.

In control group there was significant association between pre-test quality of sleep score with selected socio-demographic variables. In control group such as age in year ($\chi^2 = 14.03$), education ($\chi^2 = 9.29$), occupation ($\chi^2 = 16.01$), type of cancer ($\chi^2 = 8.58$), type of therapy ($\chi^2 = 15.49$), stage of cancer ($\chi^2 = 13.26$), and reason for not getting sleep ($\chi^2 = 17.64$) was significant at 0.05 level and there is no significant association between gender, monthly family income, type of family, habits, duration of illness and technique used for sleep at home regarding quality of sleep at 0.05 level. Hence, research hypothesis **H₂** was accepted.

IV. Discussion

Major findings of the study

A. Finding regarding socio-demographic variables:

Age in years: Projected that most of the participants in experimental group i.e. 40% in 51-60 year of age group, whereas in control group most of the participant i.e. 33% in 41-50 years of age. **Gender:** Showed that majority

of the respondent i.e. 50% male & 50% female in experimental group, whereas in control group i.e. 60% male and 40% female. **Education:** Projected that most of the participants in both experimental or control group i.e. 45% or 58% were belonged to non-formal education. **Monthly family income:** Depicted that most of the participants in experimental group i.e. 45% were from 10k and below and in control group i.e. 33% were from 10k and below. **Occupation:** Projected that most of the participants i.e. 40% each in experimental and control group were house wife. **Type of family:** Showed that most of the participants i.e. 60% each in experimental and control group were joint family. **Habit:** Projected that most of the participants in experimental group i.e. 50% were none, whereas in control group 30% were smoking. **Type of cancer:** Depicted that most of the participants in experimental group i.e. 30% were having lung cancer whereas in control group 45% were having other type of cancer. **Type of therapy:** Projected that most of the participants in experimental group i.e. 40% were taking chemotherapy whereas in control group 33% were taking both chemo and radio therapy. **Stage of cancer:** Showed that most of the participants in experimental group i.e. 40% were in stage-II, whereas in control group 33% were in stage-II. **Duration of illness:** Projected that most of the participants in experimental group i.e. 40% were <6 month and 6-12 month, whereas in control group 50% were <6 month and 1 year and above. **Technique used for sleep at home:** Depicted that most of the participants in both experimental and control group i.e. 50% were using technique watching TV. **Reason for not getting sleep:** Showed that most of the participants in experimental group i.e. 45% were having pain, whereas in control group 40% were having pain.

B. Findings regarding pre-test, post-test quality of sleep level of respondents among cancer patients in experimental group.

The quality of sleep among cancer patients in experimental group, the result showed that in pre-test none of the respondents had good sleep or in disturbed sleep, and 100% had poor sleep while in post-test 55% had good sleep whereas 41.67% had disturbed sleep, and 3.33% had poor sleep with cancer.

C. Findings regarding pre-test, post-test quality of sleep level of respondents among cancer patients in control group.

The quality of sleep among cancer patients in control group, the result showed that in pre-test none of the respondents had good sleep or disturbed sleep, and 100% had poor sleep while in post-test also none of the respondents had good sleep or disturbed sleep, and 100% had poor sleep with cancer.

D. Findings regarding the effectiveness of warm foot bath on quality of sleep among cancer patients in experimental group.

In experimental group the effectiveness of warm foot bath from pre-test to post-test the mean was 12.38 to 5.42; SD was 1.44 to 1.28 mean percentages was 82.56% to 36.11%. The mean difference percentage was 46.45%. The data further represents that the ‘z’ value 29.32 was significantly higher than the table value $P = 1.00$ at 0.05 level which was significant. This indicates that there is difference in pre-test and post-test quality of sleep score of the respondents and warm foot bath intervention was effective among cancer patients. Hence, research hypothesis H_1 was accepted.

E. Findings regarding the effectiveness of warm foot bath on quality of sleep among cancer patients in control group.

In control group the effectiveness of warm foot bath from pre-test to post-test the mean was 12.72 to 12.57; SD was 1.32 to 1.29 mean percentages was 84.78% to 83.78%. The mean difference percentage was 1%. The data further represents that the ‘z’ value 0.63 was significantly lesser than the table value $P = 0.7354$ which was non-significant. This indicates that there was difference in pre-test and post-test quality of sleep level of the respondents was non-significant among cancer patients.

F. Findings regarding the association between pre-test quality of sleep level with selected socio-demographic variables of respondents in experimental group.

In experimental group there was significant association between pre-test quality of sleep score with selected socio-demographic variables. In experimental group such as age in year ($\chi^2 = 12.22$), gender ($\chi^2 = 6.67$), monthly family income ($\chi^2 = 11$), habits ($\chi^2 = 14.24$), type of therapy ($\chi^2 = 11.83$), stage of cancer ($\chi^2 = 13.50$), duration of illness ($\chi^2 = 12$), reason for not getting sleep ($\chi^2 = 16.86$) was significant at 0.05 level and there is no significant association between education, occupation, type of family, type of cancer and technique used for sleep at home regarding quality of sleep at 0.05 level.

G. Findings regarding the association between pre-test quality of sleep level with selected socio-demographic variables of respondents in control group.

In control group there was significant association between pre-test quality of sleep score with selected socio-demographic variables. In control group such as age in year ($\chi^2 = 14.03$), education ($\chi^2 = 9.29$), occupation ($\chi^2 = 16.01$), type of cancer ($\chi^2 = 8.58$), type of therapy ($\chi^2 = 15.49$), stage of cancer ($\chi^2 = 13.26$), and reason for not getting sleep ($\chi^2 = 17.64$) was significant at 0.05 level and there is no significant association between gender, monthly family income, type of family, habits, duration of illness and technique used for sleep at home regarding quality of sleep at 0.05 level. Hence, research hypothesis H_2 was accepted.

V. Conclusion

This study concluded that there was improvement in quality of sleep among cancer patients which indicates that the warm foot bath was effective. The socio-demographic variables of cancer patients were significantly associated with the pre-test level of sleep quality score.

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