

# Study to Assess the Effectiveness of Warm Water Foot Bath on Reducing Level of Fatigue and Insomnia among Chemotherapy Cancer Patients

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## ABSTRACT

**Background:** Cancer is a disease caused when cells divide uncontrollably and spread into the surrounding tissue. Changes to DNA cause cancer. It is one of the most common and largest killer diseases in the world. It usually affects physically, and the disease can alter one's perspective on life and personality. Many treatment options are there to treat cancer. Among them, chemotherapy treatment may have more side effects like lethargy, esophagitis, nausea, vomiting, Fatigue, and insomnia, the most common problems among chemotherapy patients in India.

**Methods:** A quasi-experimental study with a sample size of 60, out of which 30 subjects were in the experimental group and 30 were in the control group. A convenient sampling method was used to select the subjects. A structured questionnaire tool was used to collect the data.

**Result:** The result of the study showed that, during pre-test in the study group, among 30 subjects 3(10%) had moderate Fatigue, 22(73.33%) had severe Fatigue, 5(16.67%) had worst Fatigue and 12(40%) had moderate insomnia, 18(60%) had severe insomnia and in control group among 30 subjects, 6(20%) had moderate Fatigue, 13(43.33%) had severe Fatigue, 11(36.67%) had a worst fatigue, and 14(46.67%) had moderate insomnia, 16(53.33%) had severe insomnia. With post-test, in experimental group, 14(46.67%) had no fatigue, 16(53.33%) had mild fatigue, 14(46.67%) had no insomnia, 16(53.33%) had mild insomnia, and in control group, 6(20%) had moderate fatigue, 13(43.33%) had extreme fatigue, 11(36.67%) had worst fatigue, and 14(46.67%) had moderate insomnia, 16(53.33%) had severe insomnia.

**Conclusion:** The study concluded that clients who were receiving chemotherapy had fatigue and insomnia problems. The Warm water foot bath therapy is very effective in clients undergoing chemotherapy in reducing Fatigue and insomnia. A positive correlation between pre-test and post-test was found by using the Mann-Whitney test.

**Key-words:** Cancer, Chemotherapy, Foot bath, Health, Warm water

## INTRODUCTION

### How to cite this article

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Health is a state of complete physical, mental, social well-being and not merely an absence of disease or infirmity.<sup>[1]</sup>

A disease is any harmful deviation from an organism's normal structure or functional state, generally associated with certain signs and symptoms differing from physical injury. It may be caused by factors originally from external such as infectious diseases or internal dysfunctions such as autoimmune diseases.<sup>[2]</sup>

In human beings, "disease" is often used more broadly to refer to any condition that causes distress, pain, dysfunction, social problems, and death to the person afflicted or similar problems for those in contact with the person. Cancer is a disease in which some body's cells grow uncontrollably, invade nearby tissue, and spread to other body parts—changes to DNA<sup>[3]</sup> cause cancer. Cancer can develop in almost any human body region, affecting age and gender. A quasi-experimental study with a sample size of 60, out of which 30 subjects were in the experimental group and 30 were in the control group. A convenient sampling method was used to select the chemotherapy clients with Fatigue and insomnia in the experimental and control group<sup>[4]</sup>. Immediately 12,00,000 new cancer cases are diagnosed in India every year. The risk of developing cancer generally increases with age.

In 2022, there will be an estimated 1.9 million new cancer cases diagnosed and 8.08 lakh deaths worldwide. There are 28 million cancer survivors worldwide<sup>[5]</sup>. Rates are rising as more people live to an old age and as mass lifestyle changes occur in the developing world. Cancer management is a team work that involves many treatment options. The primary treatment goal is to either altogether remove cancer from the body or destroy cancer cells that are present in the body. The most common primary treatment for cancer is surgery<sup>[6]</sup>.

The main objective of surgery is to complete the removal of cancer cells in the body as much as possible. Adjuvant treatment aims to kill the cancer cells that remain in the body after the surgery or primary treatment. Palliative treatment aims to reduce the sign and symptoms caused by cancer itself. In palliative care, surgery, chemotherapy, hormonal therapy and radiation therapy can be used.<sup>[7]</sup> In radiation therapy, high-energy rays or protons destroy cancer cells. Hormones trigger some cancers. Bone marrow transplantation is also a cancer treatment. It is also called stem cell transplantation<sup>[8]</sup>.

Chemotherapy is treatment by using medicines that contain potent chemicals to kill growing cancer cells in the body by destroying cancer cells by stopping their ability to grow and divide. Chemotherapy drugs are used alone or in combination to treat a variety of cancers. Chemotherapy drugs travel through the whole body, so there may be a chance of damaging healthy cells also. This is why chemotherapy can cause some side effects<sup>[9]</sup>. Adverse effects of chemotherapy include nausea,

vomiting, Fatigue, insomnia, diarrhea, hair loss, loss of appetite, fever, pain, mouth sores, constipation, and bleeding. Late-developing and long-lasting side effects of chemotherapy are damage to lung tissue, kidney problems, nerve damage, infertility, peripheral neuropathy and risk of second cancer<sup>[10]</sup>.

Between 80% to 90% of people, it is prevalent among cancer patients receiving chemotherapy. Apart from chemotherapy, radiation therapy, immunotherapy, hormone therapy and surgery, alternative treatments are needed to treat cancer like talk therapy, meditation, visualization, reflexology, music therapy, art therapy, biofeedback, aroma therapy, relaxation techniques, herbal remedies, massage, acupuncture and exercise emerges<sup>[11]</sup>. Warm water Foot bath therapy is one of the hydrotherapeutics. Its temperature should be 37-38 degrees Celsius. It is an accomplished way to draw blood from inflamed and congested body areas.<sup>[12]</sup> It improves peripheral circulation and provides comfort to the patient. Indications for warm water foot baths are to reduce foot and leg cramps, eliminate toxins, reduce pain and muscle cramps, increase circulation, elevate Fatigue, flu, nausea, insomnia, smooth skin and build immunity<sup>[13]</sup>.

## MATERIALS AND METHODS

It was a quasi-experimental study aiming to assess the effectiveness of fatigue and insomnia levels among clients receiving chemotherapy at selected hospitals in Bagalkot. The study's sample size was 60, of which 30 subjects were in the experimental group and 30 subjects were in the control group. A convenient sampling method was used to select the subjects with Fatigue and insomnia.

**Study Participants-** Clients undergoing chemotherapy admitted to the Hanagal Shree Kumareshwar Hospital oncology ward and Research Center Bagalkot, India.

**Sample size-** The study's sample size was 60, out of which 30 subjects were in the control group and 30 in the experimental group.

**Settings of study-** A study was conducted in the cancer department of Hanagal Shree Kumareshwar Hospital and Research Center Bagalkot, India.

**Data Collection Instrument-** A questionnaire was used to collect the demographic variables. Athens Insomnia

Scale was used to assess insomnia. Fatigue Self-Assessment Scale was used to assess the Fatigue.

**Content validity and reliability of data collection instruments-** The five nursing experts curtailed the tool's content validity. The socio-demographic questionnaire was corrected as per the suggestions. Standardized tools such as the Athens insomnia and Fatigue self-assessment scales were used.

**Data collection procedure-** Obtained formal permission from the Principal of B.V.V.S Sajjalshree Institute of Nursing Sciences and the Medical and Nursing Superintendent of the Hanagal Shree Kumareshwar Hospital and Research Centre Bagalkot. The researcher proceeded with the data collection, obtaining the written consent. The investigator selected subjects from Hanagal Shree Kumareshwar Hospital oncology department and Research Centre Bagalkot, India. The Athens insomnia and fatigue self-assessment scales assessed the experimental and control groups. The investigator provided a warm water foot bath for about 15 minutes for the study group by singing the warm water at 36-38 degrees Celsius. The researcher conducted the intervention from 5 am to 6 am. The researcher selected 15 subjects each week for 4 weeks.

**Statistical Analysis-** The obtained data was entered in MS Excel sheet data was edited for accuracy and completeness. The categorical responses were presented with numerical codes. The data was illustrated with frequency and percentage distribution tables and diagrams. Fatigue and insomnia are described with arithmetic mean, mean rank, and standard deviation. Binary logistic regression analysis, Mann-Whitney, and chi-square test were used to determine the association and difference between Fatigue and insomnia among cancer patients receiving chemotherapy.

**Ethical Clearance-** An ethical clearance certificate was obtained and enclosed from the ethical committee of

B.V.V.S Sajjalashree Institute of Nursing Sciences, Bagalkot. Written consent was to be obtained from the patients receiving chemotherapy participating in the study. Anonymity and confidentiality regarding the data and identification of patients were maintained.

## RESULTS

As per the result age in the experimental group 7 (23.33%) of them belongs to the age group between 21-40 years, 11(36.67%) of subjects present to the age group between 41-60 years, 11 (36.67%) of the subjects belongs to the age group between 61–80 years, 1(3.33%) of them belongs to the age group of above 80 years. In the control group, 1(3.33%) of them belongs to the age group between 21-40 years, 10(33.33%) of them belong to the age group between 41–60 years, 14(46.67%) of them belong to the age group between 61-80 years, 5(16.67%) of them belongs to the age group of >80 years. It showed as per gender in the experimental group, 18(60%) were females, 12(40%) were males. In control group 11(36.67%) were males, 19(63.33%) were females. Clients receiving chemotherapy according to duration of illness 14(46.67%) had 13-24 months, and 9(30%) had 25-36 months of duration. In control group 13(43.33%) had 0-12 months of duration, 12(40%) had 13-24 months of duration, and 2(6.67%) had 25-36 months of duration, 3(10%) had more than 37 months of duration. Description of patients receiving chemotherapy according to their comorbidity shows that in the study group, 6(20%) had diabetes mellitus, 6(20%) had high blood pressure, 18(60%) had other conditions. Description of patients receiving chemo according to their cycle of chemotherapy shows that in study group 1(3.33%) had first cycle of chemotherapy, 9(30%) had a second cycle of chemo, 14(46.67%) had a third cycle of chemo 6(20%) had above 7 cycles. In control group 4(13.33%) had first cycle of chemo, 12(40%) had second cycle of chemo, 8(26.67%) had third cycle of chemo, 6(20%) had above 7 cycles of chemotherapy.

**Table 1:** Represents the description of socio-demographics and clinical variables of patients receiving chemo

Demographic and clinical variables	Study group (n=30)		Control group (n=30)	
	F	%	F	%
<b>Age</b>				
• 21-40 yrs	07	23.33	1	3.33
• 41-60 yrs	11	36.67	10	33.33



• 61-80 yrs	11	36.67	14	46.67
• >80 yrs	01	3.33	05	16.67
<b>Gender</b>				
• Male	12	40	11	36.67
• Female	18	60	19	63.33
<b>Place of residence</b>				
• Rural	12	40	21	70
• Semi-rural	08	26.67	06	20
• Urban	10	33.33	03	10
<b>Religion</b>				
• Hindu	24	80	25	83.33
• Christian	02	6.67	0	0
• Muslim	04	13.33	05	16.67
<b>Type of family</b>				
• Joint	15	50	12	40
• Nuclear	10	33.33	18	60
• Broken	05	16.67	0	0
<b>Marital status</b>				
• Married	19	63.33	20	66.67
• Unmarried	3	10	0	0
• Widow/widowed	08	26.67	10	33.33
<b>Education</b>				
• Illiterate	10	33.33	19	63.33
• Primary	8	26.67	11	36.67
• Secondary	9	30	0	0
• Graduate and others	3	10	0	0
<b>Type of diet</b>				
• Vegetarian	10	33.33	17	56.67
Non-vegetarian	20	66.67	13	43.33
<b>Duration of illness</b>				
• 0-12months.	7	23.33	13	43.33
• 13-24months.	14	46.67	12	40
• 25-36months.	09	30	2	6.67
• >37 months	0	0	3	10
<b>Co-morbidity</b>				
• Diabetes	6	20	3	10
• Hypertension	6	20	7	23.33
• Stroke	0	0	0	0
• Others	18	60	20	66.67
<b>Cycle of chemotherapy</b>				
• 1	1	3.33	4	13.33
• 2	9	30	12	40
• 3	14	46.67	8	26.67
• >7	6	20	6	20

<b>Occupation</b>				
• Government worker	04	13.33	2	6.67
• Private worker	9	30	7	23.33
• Self worker	8	26.67	11	33.67
• Unemployment	9	30	10	33.33
<b>Family income</b>				
•less than 5000	0	0	3	10
•Rs.5001-10000	15	50	15	50
•Rs.10001-20000	10	33.33	10	33.33
•More than Rs.20000	5	16.67	2	6.67

Table 2 shows that in the experimental group, for insomnia, considering per gender, the chi-square was 0.01 and the B value was 0.33 at the significant value 0.65. Considering the place of residence, chi-square value was 0.18 and the B value 0.13 at a significant value 0.71. As per religion, the chi-square was 0.10 and the B value 0.13 at a significant value 0.71. Considering the type of family, the chi-square value was 0.01 and the B value is 0.13 at a significant value of 0.51. As per marital status, the chi-square was 0.16 and the B value is 0.73 at significant value 0.10.

Regarding education, the chi-square value was 0.22 and the B value 0.65 at a significant value of 0.08. Considering the type of diet, the chi-square was 0.14 and the B value 0.13 at a significant value 0.03. As per the duration of illness, the chi-square value was 0.03, and B value 0.49 at p-value 0.33. As per co-morbidity, the chi-square value 0.02 and the B value 0.25 at p-value 0.38. As per the cycle of chemotherapy, the chi-square value was 0.01, and the B value is 0.14 at the p-value of 0.75. As per occupation, the chi-square value is 0.007 and the B value is 0.160 at p-value of 0.65. As per family income,

the chi-square value is 0.02 and the B value is 0.40 at p-value 0.41. Table 2 shows that in the control group for insomnia, considering the gender, the chi-square was 0.01 and the B value 0.50 at p-value 0.51. Considering the place of residence, the chi-square value was 0.21 at p-value 0.36.

Regarding religion, the chi-square was 0.01 and the B value 0.32 at p-value 0.51. Considering the type of family, the chi-square value was 0.12 and the B value 1.55 at p-value 0.06. As per marital status, the chi-square was 0.01 and the B value 0.40 at p-value 0.60. Regarding education, the chi-square value was 0.00 and the B value 0.07 at p-value 0.91. Considering the type of diet, the chi-square was 0.01 and the B value 0.51 at p-value 0.49. As per the duration of the illness, the chi-square value was 0.11 at p-value 0.92. As per the cycle of chemotherapy, the chi-square was 0.18 and the p-value was 0.91. Considering the co-morbidity, the chi-square value was 0.07 at p-value 0.37. Regarding the occupation, the chi-square was 0.12 at p-value 0.84. As per family income, the chi-square value was 0.19 at p-value 0.33.

**Table 2:** Association between the post-test level of insomnia among patients receiving chemotherapy in the study and control group with selected demographic and clinical variables

Demographical clinical variables	Study group (n=30)			Control group (n=30)		
	R square	B value	P value	R square	B value	p-value
Gender	0.01	0.33	0.65	0.01	0.50	0.51
Place of residence	0.18	0.13	0.71	0.21	-	0.63
Religion	0.10	0.13	0.71	0.01	0.32	0.51

Typeoffamily	0.01	0.13	0.51	0.12	1.55	0.06
Marital status	0.17	0.73	0.10	0.01	0.40	0.60
Education	0.22	0.65	0.08	0.01	0.07	0.91
Type of diet	0.14	0.13	0.03	0.01	0.51	0.49
Duration of illness	0.03	0.49	0.33	0.11	-	0.92
Cycle chemotherapy	0.01	0.14	0.75	0.18	-	0.91
Co-morbidity	0.02	0.25	0.38	0.07	-	0.34
Occupation	0.01	0.16	0.65	0.12	-	0.84
Family income	0.02	0.40	0.41	0.19	-	0.33

Table 2 reveals that there is non-significant association ( $p < 0.05$ ) between the post-test level of pain among patients receiving chemotherapy in the experimental and control group with their selected demographic variables such as age, gender, place of residence, educational status, economic status, religion, type of family, dietary pattern, duration of illness, cycle of chemotherapy, co-morbidity, occupation, and family income at  $p < 0.05$  level. Hence, hypothesis H2 is not accepted.

## DISCUSSION

It was a quasi-experimental study to evaluate the effectiveness of warm water foot baths in reducing Fatigue and insomnia among cancer patients receiving chemotherapy. 11(36.67%) subjects were in the age group between 41-60 years and 7 (23.33%) people were between 21-40 years. In a similar study, 13 (43.33%) members were in the age group between 41-60 years and 10(33.33%) were 21-40 years<sup>[14]</sup>. 12(40%) were females and 18(60%) were males compare to previous research study 12(40%) were male and 21(70%) were female<sup>[15]</sup>. 12(40%) were from rural area and 8(26.67%) semi-rural area. In a similar research study, 11(36.66%) subjects were from rural areas and 13(43.33%) were from semi-rural areas<sup>[16]</sup>. 24(80%) were belonged to Hindu religion and 02(6.67%) were Christians. In a similar research study, 14(46.66%) were from the Hindu religion

and 16(53.33%) were Christians<sup>[17]</sup>. 15(50%) belonged to joint family and 5(16.67%) were from broken family. In a previous research study, 10(33.33%) were from joint families and 2(6.66%) were from broken families<sup>[18]</sup>. 19 (63.33%) were married and 3(10%) were unmarried. Whereas in a similar research study, 23(76.66%) were married and 4 (13.33%) were unmarried<sup>[19]</sup>. 10(33.33%) were illiterate and 3(10%) graduates. In a similar research study, 13(43.33%) subjects were graduates<sup>[20]</sup>. 20(66.67%) were vegetarian and 10(33.33%) were nonvegetarian. In a similar research study, 18 (60%) were vegetarian and 12(40%) were non-vegetarian<sup>[21]</sup>. 7 (23.33%) subjects suffered from illness for 12 months and 9(30%) were for 13-24 months. In a similar research study 16(53.33%) were suffering with illness for 12 months and 11(36.66%) for 13-24 months<sup>[22]</sup>. 6(20%) subjects have diabetes mellitus and 18(60%) had other diseases. In a similar research study, 7(23.33%) had diabetes and 10(33.33%) had other chronic disorders<sup>[23]</sup>. 14(46.67%) subjects were on third cycle of chemotherapy and 1(3.33%) were receiving their first cycle. In a research study 7(23.33%) were on second cycle and 19(63.33%) were on first cycle<sup>[24]</sup> 4(13.33%) were government workers and 9(30%) were unemployed<sup>[25]</sup>.

A significant association was found between the type of diet and insomnia after the implementation of an intervention. There was no significant association

between socio-demographic factors and pain or insomnia among patients receiving chemotherapy.

## CONCLUSIONS

Finally concluded, most of the client's undergoing chemo have Fatigue and insomnia. As per my study, a warm water footbath effectively reduces Fatigue and insomnia. The study recommends that the following studies be undertaken to strengthen warm water foot baths as a good remedy for lowering Fatigue and insomnia among chemotherapy patients.

Simple measures can be effective in optimum patient care. Hence, a warm water footbath can be adapted as a routine measure of care in cancer hospitals. Warm water footbaths can be part of the health care of patients undergoing chemotherapy. Other simple care measures should be tested to ease the difficulties encountered by chemotherapy patients.

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**Research concept-**Dr. Dileep Natekar, Dr. Shridhar.Pujari

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