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A True Experimental Study to Assess the Effectiveness of Warm Water Footbath Therapy on Fever Among Children Age Group 4-9 Years at Selected Hospitals, Bilaspur, Chhattisgarh

Priya Rathore[1*], Shikha Tirkey[2], Anjum Novel[3]
[1]*M.Sc. Nursing Final Year, Department of Child Health Nursing, Government College of Nursing, Bilaspur, Chhattisgarh, India*
[2]*Assistant Professor, Department of Child Health Nursing, Government College of Nursing, Bilaspur, Chhattisgarh, India*
[3]*Demonstrator, Department of Child Health Nursing, Government College of Nursing, Bilaspur, Chhattisgarh, India*

Abstract*: The current study aimed to assess the effectiveness of warm water footbath therapy on fever among children age group 4-9 years at selected hospitals Bilaspur C.G. True experimental research design is utilized to achieve the stated. Objectives: 1. To assess the level of fever among children (age group 4-9 years) in the control group. 2. To assess the level of fever among children (age group 4-9 years) in the experimental group. 3. To assess the effectiveness of warm water foot bath therapy on fever among children (age group 4-9 years) in the experimental group. 4. To find out association between the post test level of fever among children (age group 4-9 years) in the experimental group and control group with selected demographic variables. Hypothesis: H1: There will be significant difference between level of fever among children (age group 4-9 years) in experimental and control group after application of warm water foot bath therapy.H2: There will be significant association between level of fever after application of warm water foot bath therapy among children (age group 4-9 years) in experimental and control group with their selected demographic variables. Projected Outcome/Hypothesis: The present study, true experimental research design is used to achieve the stated objectives. The study was based on the conceptual framework of modified General System Theory Ludwig von Bertalanffy. A quantitative research approach is used and pilot study was conducted to confirm the feasibility of the study. For main study simple random sampling was used on 40 samples of children age group 4-9 years with fever. The tool used for data collection consists of sociodemographic variables and used of standardized digital thermometer. The data was analyzed using descriptive and inferential statistics where the results show the findings depicted that in the view of inferential statistics there is decrease in the level of fever after warm water footbath therapy in children worked out to compare the difference in level of fever between control group and experimental group. The difference in mean level of fever between control group and experimental group was observed to be 0.91, which was statistically highly significant (t=7.99, df=39) at 0.05 level. Hence H1 is accepted.

***Keywords*: warm water footbath therapy, fever.**

1. Introduction

Fever is a natural response of the body that helps in fighting off foreign substances such as microorganisms and toxins. Thermoregulatory center in the hypothalamus regulates the body temperature. Once the temperature goes up the person often feels warm. The symptom of sweating and vasodilation resets the altered set point to normal level. Hot water foot bath therapy causes blood vessels to dilate and improve blood circulation, which releases heat in the form of sweat and supply of oxygen to brain cell which aids in the elimination of toxins. The immersion of the body or part of the body in a water bath stimulates circulation. Water being good thermal conductor, can influence temperature regulation mechanism of the body through circulation. The body's normal temperature is around 98.6 degrees F. Fever has long been recognized as a symptom and not a disease in itself. It has been estimated that up to 20% of emergency department visits are children having fever and seeking for treatment and about 30% of patients seen by pediatricians with their primary is fever in United States. Furthermore, parents are usually too anxious about what harm may fever cause even though their children only suffer from minor illnesses. Therefore, fever as a symptom in children and its management is a concern to both healthcare professionals as well as parents. During fever dilation of internal blood vessels and constriction of peripheral blood vessels occurs. It weakens the patient and makes him/her uncomfortable and anxious. Therefore, fever as a symptom and its management is a concern to both healthcare professionals as well as patients. Providing comfort to patient is a basic and most important nursing intervention. In complementary therapies most of the intervention done on the sole of the foot based on cord reflex. The local application of temperature produces stimuli on cord reflex on the sole of the foot. These reactions are caused by local effect of temperature directly on the blood vessels and also by local cord reflex conducted from skin receptors to the spinal cord and back to the same skin area and the sweat gland. The intensity of this local effect is, in addition, controlled by the central brain temperature controller. So that their overall effect

*Corresponding author: priyarathore2508@gmail.com

is proportional to the hypothalamic heat control signal times to the local signal. Antipyretic therapy is an effective pharmacological measure to reduce fever, along with pharmacological measures there are many non-pharmacological measures like cold sponging, tepid sponging, external cooling, warm water therapy found to be effective in controlling the temperature. There is a controversy regarding the indication for and the use of the heat and cold therapy. But many studies have shown that, hydrothermal therapy is an effective method for treating. Hydrotherapy is broadly defined as the external application of water in any form or temperature (hot, cold, steam, liquid, ice) for healing purposes. Hydrothermal therapy is one such modality shown to be effective in reducing fever. Studies have shown that warm water foot bathing helps to provide comfort and reduce high temperature through sweating. Warm water foot bath therapy is a local immersion bath covering the feet and ankles at a water temperature ranging from 90-100 F. Warm water foot bath therapy causes blood vessels to dilate and improve blood circulation, which releases heat in the form of sweat and supply of oxygen to brain cell which aids in the elimination of toxins. The immersion of the body or part of the body in a water bath stimulates circulation. A warm water foot bath therapy increases nourishment to the tissues and relaxes tension. Warm application to the foot causes the congested blood to flow towards distant parts of the body and is brought to the dilated vessels of the foot and leg. When warm water foot bath therapy applied for 15-20 minutes, the blood vessels in the feet starts expanding and gets improved circulation, neutralizing acid and killing bacteria, and relieving aches, tiredness and fever. The improved blood circulation resets the hypothalamic set points by heat transfer from higher heat area to lower heat area.

The study concluded that warm water foot bath therapy was more effective for children with fever. Warm water foot bath therapy is considered as a non-pharmacological, safe and side effect free, cost effective, and easy to administer technique.

The investigator from her own experience felt that warm water footbath therapy is found to be effective non pharmacological, safe, side effect free, cost effective and easy to perform in all settings.

2. Result and Discussion

Organization of data: The findings of the study were *discussed under six sections stated below*

- *Section A:* Frequency and percentage distribution of participant according to socio demographic variables of the children.
- *Section B:* Assessment of level of fever in children (age 4-9 year) in control and experimental group.
- *Section C*: (I) Assess the effectiveness of warm water foot bath therapy on fever among children (age group 4-9 years) in the experimental group. (II) Comparison of post test level of fever among children (age 4-9 year) between control and experimental group.
- *Section D:* Association of level of fever in children (age 4-9 years) in control and experimental group with their selected socio demographic variables.

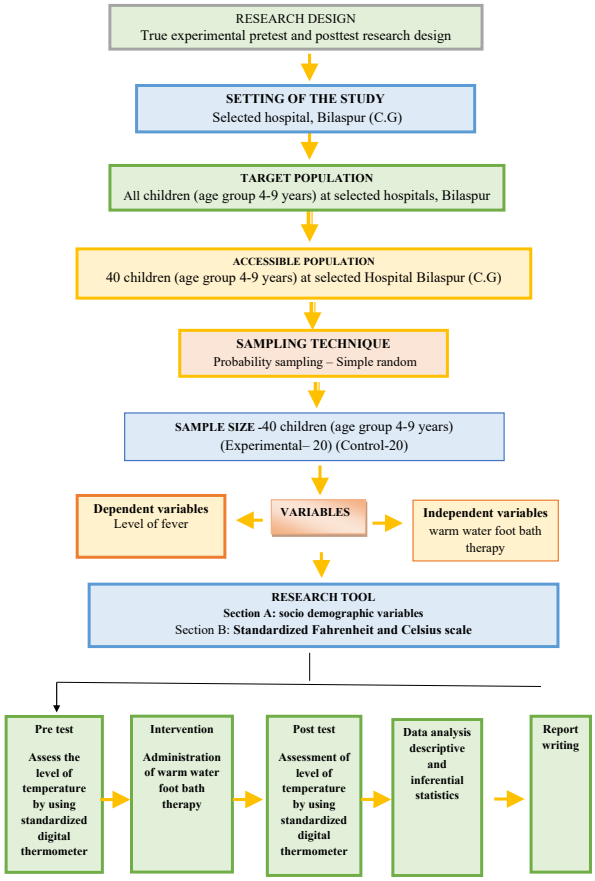

Fig. 1. Methodology

The analysis of data was organized and presented under the following headings:

- In control group maximum 9 (45%) of children were in age group of 6-7 years, 7 (35%) of children were in age group of 4-5 years and 4 (20%) of children were in 8-9 years of age group. In experimental group maximum 8 (40%) of children were in age group of 6-7 years, 8 (40%) of children were in age group of 4-5 years of age and 4 (20%) of children were in 8-9 years of age group in experimental group.
- In control group 10 (50%) of children were male and 10 (50%) children were female. In experimental group maximum 12 (60%) of children were female and 8 (40%) children were male.
- In control group maximum 11 (55%) of children were from urban area and 9 (45%) children were from rural area in control group. In experimental group maximum 12 (60%) of children were from rural area and 8 (40%) children were from urban area.
- In control group maximum 8 (40%) of father of children were graduate, 7 (35%) of father had primary education and 5(25%) of father had secondary education and no one were illiterate and postgraduate. In experimental group maximum 8 (40%) of father of children had secondary education,7 (35%) of father

were graduate and 5 (25%) of father had primary education and no one were illiterate and postgraduate.

- In control group that maximum 9 (45%) mother of children had primary education, 8(40%) of mother had secondary education and 3(15%) of mother had graduate and no one were illiterate. In experimental group maximum 12 (60%) of mother of children had primary education, 5 (15%) of mother had secondary education and 3 (15%) of mother had graduate education and no one were illiterate and postgraduate.
- In control group maximum 9 (45%) of father were in private job and 9(45%) had earning through daily wages, 1(5%) were in government job and 1(5%) were in other occupation. In experimental group maximum 12 (60%) of occupation of father were in private job, 6 (30%) had earning through daily wages and 2 (10%) were in government job.
- In control group maximum 9 (45%) of mother had earning through daily wages, 9(45%) were in other occupation and 4(10%) were in private job and no one were in government job. In experimental group maximum 7 (35%) of occupation of mother were earn through daily wages, 7(35%) were in other job, 6 (30%) were in private and no one were in government job in experimental group.
- In control group maximum 7 (35%) of children had one day duration of hospitalization, 5 (25%) of children had two days duration of hospitalization ,4 (20%) of children had three days of hospitalization and 4 (20%) children had more than three days of duration of hospitalization. In experimental group maximum 7 (35%) of children had one day duration of hospitalization, 6 (30%) of children had two days duration of hospitalization ,5 (30%) of children had more than three days duration of hospitalization and 3 (15%) of children had three days of hospitalization.
- In control group maximum 14 (70%) of children had upper respiratory infection and 6(30%) of children had gastroenteritis. In experimental group maximum 12 (60%) of children had upper respiratory infection and 8 (40%) of children had gastroenteritis.
- In control group maximum 20 (100%) of children were using antipyretics. In experimental group maximum 20 (100%) of children were using antipyretics.
- In control group 10 (50%) of children were using antibiotics and 10 (50%) of children were not using antibiotics. In experimental group maximum 12 (60%) of children were not using antibiotics and 8 (40%) of children were using antibiotics.

Section B:

Assess the level of fever among children (age group 4-9 years) in control group and experimental group

It revealed that in control group pre test 100% children had mild pyrexia and in post test 20% had normal level of temperature and 80% had mild pyrexia with pre test mean score of level of fever among children (age group 4-9 years) 99.67 and SD 0.31 and in post test mean score 99.5 and SD 0.36. In experimental group revealed that pre test 10% children had normal body temperature and 90% children had mild pyrexia and in post test 70% had normal level of temperature and 30% have mild pyrexia with pre test mean score of level of fever among children (age group 4-9 years) is 99.81 and SD is 0.32 and in post test mean is 98.64 and SD is 0.36

Section C (I):

Effectiveness of warm water footbath therapy on fever among children (age group 4-9 years)

In control group the pre test mean is 99.67, SD is 0.31 and post test mean is 99.55, SD is 0.36. mean difference is 0.12, t value is 1.08 is less than 2.09 at p=0.0001 indicates there is no significant difference in level of fever. In experimental group the pre test mean is 99.81, SD is 0.32 and post test mean is 98.64, SD is 0.36. mean difference is 1.17, t value is 10.91which is greater than 3.898 at p=0.0001 for DF 19 indicates there is significant difference observed in level of fever in experimental group.

Section C (II):

Comparison of post test level of fever among children (age 4-9 year) between control and experimental group

Depicted that in the view of inferring the statistical there is decrease in the level of fever after warm water footbath therapy in children worked out to compare the difference in level of fever between control group and experimental group. The difference in mean level of fever between control group and experimental group was observed to be 0.91, which was statistically highly significant (t=7.99, df=39) at 0.05 level.

Section D:

Association between the posttest level of fever among children (age group 4-9 years) in the control group and experimental group with selected demographic variables

In control group showed that there is no association between post test level of fever with selected socio demographic variables.

In experimental group on applying, the chi-square test demographic variable “Gender”, “child diagnosis” and “use of antibiotics” were significantly associated with the posttest level of fever in the experimental Group. The $\chi 2$ value of “Gender” and child diagnosis was 6.70 and 7.08 greater than the table value (3.84) at 1 degree of freedom. Similarly, “use of antibiotics” has $\chi 2$ value 5.71 greater than 3.84 at 1 degrees of freedom. Hence H2 i.e., there is a significant association between the posttest level of fever in the experimental Group with “Gender”, “child diagnosis” and “use of antibiotics” is accepted.

The findings are supported by study conducted by Aileen Christal Pereira and Shanti Sebastian (2017) conducted a quasi-experimental study pre test and post test design on effectiveness of hot water foot bath therapy in reduction of body temperature among children (6-12 years) with fever in selected hospitals at Mangaluru. The study showed that there was a very high significant difference between the pre test and post test reduction in experimental group t value 8.068 at p value 0.0001. also $t(58)=1.99$ at $p<0.05$ level of significance.

3. Testing of Hypothesis

Hypothesis testing is done to evaluate the effectiveness of warm water footbath therapy in experimental group. t-test was worked out to compare the difference in level of fever between control and experimental group. the difference in mean score between control group and experimental group was observed to be 0.91 which was highly significant (t=7.99, df =39) at 0.05 level. This statistical calculation indicate that the research hypothesis H1 is accepted. This study shows there is a significant decrease in level of fever in experiment group.

This study shows that there is a significant association between the posttest level of fever in the experimental Group with "Gender", "child diagnosis" and "use of antibiotics" hence H2 accepted.

4. Conclusion

This paper presented study to assess the effectiveness of warm water footbath therapy on fever among children age group 4-9 years at selected hospitals, Bilaspur, Chhattisgarh.

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