A study to assess the effect of hot water foot bath therapy on body temperature among patients with fever, admitted in selected Hospital, Mysuru.

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ABSTRACT: This study has been undertaken toassess the effect of hot water foot bath therapy on body temperature among patients with fever, admitted in selected Hospital, Mysuru. A quasi-experimental non-equivalent control group pre test-post test design was used and non-probability purposive sampling technique was used to select the 60 patients with fever who are undergoing treatment, 30 each in experimental and control group. Personal Proforma was used to elicit the personal variables. The body temperature was assessed by using clinical thermometer. The intervention i.e., application of hot water foot bath therapy was administered to the experimental group along with prescribed treatment whereas control group received only prescribed treatment. Data were analyzed by using descriptive and inferential statistics. The results of the study revealed that, the computed repeated measures of ANOVA was significant within the groups at 0.05 level of significance. Findings also revealed that the independent 't' value for post test 1 and 2 (post test 1: 3.18 and post test 2:3.6;$p<0.05$) were significant between experimental and control group and inferred that the application of hot water foot bath therapy along with prescribed treatment was effective . The result also revealed that the application of hot water foot bath therapy had no significant association with their selected personal variables. It was concluded that, application of hot water foot bath therapy along with prescribed treatment was effective in reducing the body temperature than only prescribed treatment among patients with fever.

Keywords: Fever; hot water foot bath therapy; prescribed treatment.

INTRODUCTION:

Fever is one of the most common medical signs and is also a natural bodily defence against infection. Fever is the body temperature above the normal of 98.6^0 F (37 degrees C.). It is usually measured with a thermometer. Fever is a normal, coordinated response of the body to a perceived threat to the immune system, which includes autonomic, behavioural and neuroendocrine responses.

One of the most versatile and helpful of the true remedies is the hot water foot bath. It can be used to reduce a fever since it causes the number of circulating white blood cells to be increased and the toxins which cause an elevated body temperature are removed, and the thermostat is restored to normal. The hot foot bath can combat a cold, headache, or any congestion of the head, the chest, or the pelvic organs in menstrual difficulties by pulling excess blood from the congested part, thereby increasing the effective circulation.

Global incidence of dengue has drastically upped in the last few years. According to the World Health Organization (WHO), there are about 390 million cases of dengue fever worldwide, and of the total number of cases, 96 million require medical treatment. India also saw a doubling up of cases of dengue from 2014 to 2015 and the worst hit city was Delhi with over 1800 cases of the fever.

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 that are found to be effective in` controlling the temperature. There is a controversy regarding the indication for and the use of the heat and cold therapy9. But many studies have shown that, hydrothermal therapy is an effective method for treating fever.

Hot 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 hot water foot bath therapy applied for 15-20 minutes the 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.

There are different non pharmacological and pharmacological methods to manage the fever in children and adult. But there will be certain complication like shivering and vasoconstriction. The routine procedure tepid sponge more discomfort during fever management in young and grown up patient. So the investigator interested applies hot water foot bath therapy in reduction of fever. It is a complimentary alternative therapy; help the parents, family members and nurses in the management of fever, in an easy, cost effective, without shivering, vasoconstriction and complication.

OBJECTIVES:

1. To assess the body temperature of the patients with fever in experimental and control groups before the hot water foot bath therapy.
2. To assess the effect of hot water foot bath therapy among the patients with fever of both groups in terms of fever reduction.
3. To find the association between changes in body temperature of patients with fever with their selected personal variables.

HYPOTHESES:

H_1: There will be significant difference between mean pre and post body temperature of patients with fever of experimental and control groups.
H_2: There will be significant difference between mean post scores of patients with fever those who have undergone hot water foot bath therapy and those who have not undergone hot water foot bath therapy.
H_3: There will be significant association between the changes in body temperature of patient with their selected personal variables.

METHODOLOGY:

The research study was conducted in selected Hospital of Mysuru district in Karnataka state.Research design adopted for the study was quasi-experimental non-equivalent control group pre-test post-test design. Non-probability purposive sampling technique was used to select the 60 patients with fever who are undergoing treatment, 30 each in experimental and control group.The target population were only considered for the study was patients with fever who are undergoing treatment and who met the inclusion criteria and are admitted in selected hospital in Mysuru. Personal Proforma was used to elicit the personal variables. Hot water foot bath therapy was administered to the experimental group along with prescribed treatment for 20 minutes by the investigator by immersing both the foot of the patient till 3-8 inches above the ankles in hot water of temperature ranging from 100^0F- 110^0F whereas control group received only prescribed treatment. The body temperature was assessed before administering intervention and post test was done on after 30 minutes and 2nd day of intervention in 2 different shifts by using clinical thermometer through axillary method. At the end of data collection the investigator had elicited patient experiences with regard to hot water foot bath therapy was assessed by an open ended question(Opinionnaire).

RESULTS:

TABLE 1

Frequency and percentage distribution of patients with fever in experimental and control group according to their selected personal variables

n =60

Sl. no.	Selected personal variables	Experimental group n =30		Control group n =30	
		f	%	f	%
1.	**Age in years**				
	1.1 20-40 years	12	40	11	36.6
	1.2 41-60 years	14	46.6	12	40
	1.3 61 years and above	4	13.3	7	23.3
2.	**Gender**				
	2.1 Male	20	66.6	21	70
	2.2 Female	10	33.3	9	30
3.	**Diagnosis**				
	3.1 Mycobacterium	2	6.6	4	13.3
	3.2 Other bacteria	8	26.6	5	16.6
	3.3 Viral infection	19	63.3	15	50
	3.4 Others	1	3.3	6	20
4.	**Duration of fever**				
	4.1 ≤1 week	19	63.3	19	63.3
	4.2 > 1 week	11	36.6	11	36.6
5.	**Co- morbidities**				
	5.1 Diabetes Mellitus	4	13.3	7	23.3
	5.2 Hypertension	7	23.3	6	20
	5.3 Diabetes &Hypertension	2	6.6	1	3.3
	5.4 HIV	1	3.3	2	6.6
	5.5 No Co- morbidity	16	53.3	14	46.6

6.	**Patients on any oral antipyretics**				
	6.1 Yes	25	83.3	19	63.3
	6.2 No	5	16.6	11	36.6
7.	**Patients on antibiotics**				
	7.1 Yes	21	70	23	76.6
	7.2 No	9	30	7	23.3

The data presented in **Table 1** shows that, in the experimental group maximum samples (46.6%) were in the age group of 41-60 years and in control group maximum samples (40%) were in the age group of 41-60 years .With regard to gender in both the experimental (66.6%) and control group (70%) maximum samples were Male.Maximum samples in experimental group (63.3%) and control group (50%) were diagnosed with viral infection and the duration of fever is ≤1 week in both experimental group (63.3%) and control group (63.33%). Maximum samples both in experimental (53.3%) and control (46.6%) group were no Co-morbidity and maximum samples both in experimental (83.33%) and control (63.33%) group were on antipyretics.Maximum samples both in experimental (70%) and control (76.6%) group were on antibiotics.

TABLE 2

Mean, median, standard deviation, range of pre-test and post-test temperature scores of patients with fever in experimental and control group

n =60

Day	Tests	Mean	Median	Range	SD
Experimental group n=30					
Day 1	**Pre- test**	101.48	101.1	100-104.2	±1.15
	Post-test 1	100.04	99.7	97.6-102.7	±1.19
Day 2	**Post- test 2**	98.13	98.3	96.6-100.6	±0.92
Control group n=30					
Day 1	**Pre-test**	101.4	101.05	100.2-104.2	±1.07
	Post-test 1	100.9	100.45	99.7-104	±0.97
Day 2	**Post-test 2**	99.14	98.6	97.2-103.2	±1.33

The data presented in **Table 2** shows that, the mean pre-test temperature scores of patients with fever among experimental group is 101.48 ±1.15 and range is 104.2-100; whereas among control group the mean pre-test temperature scores is 101.4 ±1.07 and range 104.2-100.2.The mean post-test temperature scores are 100.04±1.19 in post-test 1, 98.13±0.92 in post-test 2 among experimental group; whereas the mean post-test temperature score are 100.9 ±0.97 in post test 1,99.14 ±1.33 in post test 2 among control group.

TABLE 3

Mean, mean difference, standard deviation of the difference, standard error of the mean difference and independent 't' value of pre-test temperature scores in experimental and control group

n=60

Groups	Mean score	Mean D	SD difference	SEMD	Independent 't' value
Experimental n=30	101.48	0.08	±0.08	0.02	0.29
Control n= 30	101.4				

$t_{(58)}$=2.00;p>0.05

The data presented in **Table 3** shows that, the mean difference between the pre-test temperature scores of patient with fever among experimental and control group is 0.08. To find out the significant difference in mean score, an independent 't' test was computed and obtained value of independent $t'_{(58)}$ =0.29 p>0.05 is found to be not significant. Hence, it was inferred that there is no significant difference between mean pre test temperature scores of experimental and control group and both the groups started from an equivalent baseline.

TABLE 4
Repeated measures of ANOVA within the subjects among experimental and control group.

n=60

Source	Df	Type III Sum of squares	Mean squares	F Ratio	Significance
Decrease in temperature scores	2	241.03	120.52	247.88	0.00*
Decrease withrespect to group	2	10.92	5.46	11.24	0.00*

p< 0.05; *Significant

The data presented in **Table 4** shows that, calculated value is lesser than 0.05(p<0.05).Therefore the null hypothesis $\mathbf{H_{01}}$is not supported and inferred that there is significant difference in the mean pre-test post-test temperature scores of patients with fever who had undergone hot water foot bath therapy and those who has not undergone hot water foot bath therapy.

TABLE 5
Mean, mean difference, standard deviation of the difference, standard error of the mean difference and independent 't' value of post-test 1 temperature scores in experimental and control group.

n=60

Groups	Mean score	Mean D	SD difference	SEMD	Independent 't' value
Experimental n=30	100.04	-0.86	±0.22	0.04	3.18*
Control n= 30	100.9				

$t_{(58)}$=2.00;p>0.05;*Significant

The data presented in **Table 5** shows that the mean difference in temperature scores of patient with fever among experimental and control group is -0.86. This indicates that there was decreased in temperature scores among experimental group after receiving hot water foot bath therapy. To find the significance of difference in mean body temperature, the independent 't' test was computed and obtained value of independent 't' $_{(58)}$ =3.18 was found significant at 0.05 level of significance.

Hence, the null hypothesis $\mathbf{H_{02}}$ was not supported and research hypothesis $\mathbf{H_2}$was not rejected and inferred that the mean post-test 1 body temperature of patient with fever who had undergone hot water foot bath therapy was significantly lower than the mean post-test 1 body temperature of patients with fever who had not undergone hot water foot bath therapy was effective in reducing temperature among patients with fever.

TABLE 6
Mean, mean difference, standard deviation of the difference, standard error of the mean difference and independent 't' value of post-test 2 temperature scores in experimental and control group.

n=60

Groups	Mean score	Mean D	SD difference	SEMD	Independent 't' value
Experimental n=30	98.13	-1.01	±0.41	-0.08	3.6*
Control n= 30	99.14				

$t_{(58)}$=2.00;p>0.05;*Significant

The data presented in **Table 6** shows that the mean difference in temperature scores of patient with fever among experimental and control group is -1.01. This indicates that there was decreased in temperature scores among experimental group after receiving hot water foot bath therapy. To find the significance of difference in mean body temperature, the independent 't' test was computed and obtained value of independent 't' $_{(58)}$ =3.6 was found significant at 0.05 level of significance.

Hence, the null hypothesis $\mathbf{H_{02}}$ was not supported and research hypothesis $\mathbf{H_2}$was not rejected and inferred that the mean post test 2 body temperature of patient with fever who had undergone hot water foot bath therapy was significantly lower than the mean post-test 2 body temperature of patients with fever who did not undergone hot water foot bath therapy was effective in reducing the temperature.

TABLE 7
Chi-square values between the changes in body temperature of patients with fever and their selected personal variables.

n=60

Sl. no.	Selected personal variables	Below median <100.7	Median and above median ≥100.7	Chi square
1.	**Age in years**			
	1.1 20-40 years	12	11	
	1.2 41-60 years	10	16	3.89#
	1.3 61 years and above	8	3	
2.	**Gender**			
	2.1 Male	20	21	0.07
	2.2 Female	10	9	
3.	**Diagnosis**			
	3.1 Mycobacterium	5	1	
	3.2 Other bacteria	8	5	0.55#
	3.3 Viral infection	14	20	
	3.4 Others	3	4	
4.	**Duration of fever**			
	4.1 ≤1 week	18	20	0.21
	4.2 > 1 week	12	10	
5.	**Co- morbidities**			
	5.1 Diabetes Mellitus	3	8	
	5.2 Hypertension	8	5	5.03#
	5.3 Diabetes &Hypertension	1	2	
	5.4 HIV	1	2	
	5.5 No Co- morbidity	17	13	
6.	**Patients on any oral antipyretics**			
	6.1 Yes	20	24	1.36
	6.2 No	10	6	
7.	**Patients on antibiotics**			0.34
	7.1 Yes	21	23	
	7.2 No	9	7	

$\chi^2_{(1)}$ =3.84, $\chi^2_{(2)}$ =5.99, $\chi^2_{(3)}$ =7.82, $\chi^2_{(4)}$ =9.49;p>0.05; # = Yates correction done

The data presented in **Table 7** shows that, the computed chi-square values were not found to be significant for the selected personal variables viz. age, gender, diagnosis, duration of fever, co-morbidities, patients on antipyretics and patients on antibiotics of patients with fever who are undergoing treatment at 0.05 level of significance. Therefore, the null hypothesis **H_{03}**is supported, inferring that there is no significant association between the changes in body temperature of patients with fever and their selected personal variables.

OPINIONNAIRE:

The investigator had elicited patient experiences with regard to hot water foot bath therapy as assessed by an open ended question (Opinionnaire) at the end of the intervention i.e. on 2nd day. Subjects were expressed in their own words that application of hot water foot bath therapy helped them to relaxed (80%) comfortable (90%) and provided sound sleep (70%). (5%) of the participants expressed that the intervention was not at all effective. Few of the subjects were continued to practice the therapy themselves, which also suggests that hot water foot bath therapy has a positive effect in promoting comfort of the patients.

CONCLUSION:

The findings of the study revealed that application of hot water foot bath therapy helped to reduce body temperature in patients with fever and it enhances rapid reduction of increased body temperature along with prescribed treatment than only prescribed treatment. Thus the study suggests that hot water foot bath therapy is a simple an easy, cost effective, without shivering, vasoconstriction and complication and is an affordable intervention which is effective in decreasing the temperature of the body in patients with fever and nurses can readily use this intervention.

REFERENCE:

1. Hilaire J. Thompson, Sarah H. Kagan. Clinical management of fever by nurses: doing what works. Journal of Advance Nurses. 2011 Feb; 67(2): 359–370. Available from:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3038203/.Doi:10.1111/j.1365-2648.2010.05506.x

2. Agatha M. Thrash. Hot Foot Bath. Preventive Medicine. Available from:http://www.ucheepines.org/hot-foot-bath/
3. Dengue 2016: Here's all you need to know. The Times of India. 2016 Jun 1; Available from:http://timesofindia.indiatimes.com/life-style/health-fitness/health-news/Dengue-2016-Heres-all-you-need-to-know/articleshow/52533932.cms
4. Leung Luk, Yin Ha Ha, Siu Mai Hui.A survey on fever Management practices among paediatric Nurses In three regional acute hospitals in Hongkong. Macau Journal of Nursing. 2008;7(1)
5. R. Selvakumari. Hot Water Foot Bath Therapy for patient with fever. Nightingale Nursing Times. 2011 March; 6(12)
6. Potter and Perry. Fundamentals of nursing, concept, process and practice. 6thed. Mosby publication; 1985:196-206.
7. S Thomas, C. Vijayakumar, R. Naik, P.D Moses and B. Antoniasamy. Comparative effectiveness of tepid sponging and antipyretic drug Versus Only Antipyretic Drug in the Management of Fever Among Children: A Randomized controlled Trial. Child3@cmcvellore.ac.in.Availablefrom:http://medind.nic.in/ibv/t09/i2/ibvt09i2p133.pdf
8. Sindhu Joseph. Warm water foot bath for fever reduction. National Institute of medical statistics (Indian Council of Medical Research): 2017 Feb. Available from: http://ctri.nic.in
9. IshitaMandal, SumitaDatta, et. al. Effectiveness of Warm Water Foot-Bath Therapy on Physiological Parameters of Children with Fever. Journal of Nursing Science & Practic.2014 Aug;4(2).
10. Aileen Christal Pereira and ShanthiSebastian.Effectiveness of hot water foot bath therapy in reduction of temperature among children (6-12 years) with fever in selected hospitals at Mangaluru. International Journal of Applied Research.2017 Dec; 4(1): 86-92.
11. StutiSunar. An Experimental Study to Assess the Effect of Hot Water Foot Bath in Patients with Fever Admitted in Selected Hospitals of PimpriChinchwad Municipal Corporation, Pune. Community and Public Health Nursing.2017 April; 2(1):25-29. DOI: http://dx.doi.org/10.21088/cphn.2455.8621.2117.4