Effectiveness of Hand-Foot massage on the post operative pain among Open Heart Surgery Patients: A Randomised Control Trial

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Abstract—The study was conducted to assess the effectiveness of hand-foot massage on post operative pain among open heart surgery patients. The study design was a Randomized Control Trial and was performed in the Cardio-thoracic unit, Kasturba Hospital, Manipal. 30 patients were selected based on sampling criteria and were randomly allocated to the experimental (n=15) and control group (n=15). Preoperative pain was measured for both the groups using Numerical Pain scale and Observational checklist for behavioral response to pain. In the post operative period, 20 minutes of Hand-foot massage was given to the experimental group along with the routine care and the control group received only the routine care. Statistically significant difference was found based on numerical pain scale (p=0.02) and observational checklist for behavioral response to pain (p<0.01) in the level of pain between the experimental and control group. Hence, it was concluded that hand-foot massage was effective in reducing post operative pain in open heart surgery patients.

Key words: Pain, foot and hand massage, post operative open heart surgery.

INTRODUCTION

Pain is a complex multifaceted phenomena. It is an individual unique experience, that may be difficult to describe or explain, and often difficult for others to recognize, understand and assess. Pain often leads to debilitation, diminished quality of life and depression. Pain management challenges every health care team member for there is no single universal treatment.¹

Postoperative pain relief is one of the most important concerns for patients undergoing cardiac surgery and is one of the most clinically challenging problems for nurses. It is widely recognized that postoperative pain can negatively impact cardiac surgery outcomes, yet recent surveys report only modest success in pain management as patients continue to describe poorly controlled pain and studies report pain as underestimated, under medicated, and unrelieved.²

Physiological response to pain creates harmful effects that prolong the body’s recovery after surgery. Patients routinely report mild to moderate pain even though pain medication had been administered. Complimentary strategies based on sound research findings are added to supplement post operative pain relief using pharmacologic management.³ Massage stimulates the cutaneous mechanoreceptors that activate large primary afferents. Massage is the most widely used complimentary therapy. Massage is an extended form of touch, which results in energy exchange. It soothes pain, produces relaxation, and increases pain thresholds, therefore massage modifies the individual’s perception of pain.³

Objectives of the study were to:

1. assess the level of pain in post operative open heart surgery patients in experimental and control group.
2. evaluate the effectiveness of hand-foot massage in post operative open heart surgery patients in terms of difference in the level of pain of experimental group and control group.

Research hypotheses

All the hypotheses were tested at 0.05 level of significance.

H₁. There will be a significant difference in the level of pain between experimental and control group of post operative open heart surgery patients.

CONCEPTUAL FRAMEWORK
The framework of the present study is based on Stufflebeams CIPP (revised 2002). The main components of the CIPP model are context, input, process and product. In this study the **Context** include the objectives of the study and patients undergoing open heart surgery, **Input** includes 20 minutes hand-foot massage, **Process** is the allocation of eligible sample to the experimental and control group. Routine care and hand-foot massage for twenty minutes was given twice a day to the experimental group for three post operative days and only routine care was provided to the control group. Measurement of level of pain was done before and after every intervention. **Product** is the output that is difference in the level of pain between the experimental and control group of post operative open heart surgery patients.

**RESEARCH METHODOLOGY**

The randomized control trial (RCT) design was used for the study. The variables in the study were hand-foot massage ( independent variable) and post operative pain (dependent variable). The sample consisted of 30 patients who were selected based on sampling criteria. The sample was randomly allocated to the experimental (n=15) and the control group (n=15) by simple randomization technique. The study was conducted at Manipal group of Hospitals, Karnataka.

The data was collected through demographic proforma, Numerical Pain scale, Observational checklist for behavioural response to pain.

The content validity was established by giving the tool to seven experts. The reliability of Observational checklist for behavioural response to pain was computed to be 0.96 by spearman rank correlation coefficient.

A pilot study was carried out on 10 patients (experimental group=5, control group=5) who underwent open heart surgery and it was found to be feasible.

**DATA COLLECTION PROCEDURE**

Formal administrative permission and informed consent from the participants were obtained. The sample was selected based on the sampling criteria. The patients who were undergoing open heart surgery, willing to participate, having pain intensity greater than 3 on Numerical Pain Scale in the post operative period were included in the study. Demographic proforma was used to collect sample characteristics. Eligible 30 participants were randomly assigned to experimental (n=15) and control group (n=15) by using the simple randomization technique. After the surgery on the post operative day 1, the pretest was done to assess the level of pain for both the groups before giving intervention. For the experimental group, along with the routine care (Inj. Tramadol 50 mg intra venous T.I.D) full hand-foot massage of 20 minutes duration was given (5 minutes for each extremity) after three and half hours of administration of analgesia and only routine care was provided to the control group. Hand-foot massage was given twice a day; in the morning and evening for three continuous post operative days by the researcher itself. This massage was done first on hands and then on feet consecutively. The post test was taken to assess the level of pain in both the groups after every intervention.

**DATA ANALYSIS**

Data was analysed using SPSS windows 16.0 version. The descriptive statistics was used for sample characteristics and the inferential statistics (RMANOVA) was used to find out the effectiveness of foot and hand massage on the level of pain.

**RESULTS**

The majority of the sample in the experimental group belonged to the category of 41-50 years (33.3%) and 51-60 years (33.3%) and most of the sample in the control group belonged to the category 51-60 years (40%). 80% of the sample were males in the experimental group and 53.3% were females in the control group. The maximum number of the sample had secondary education (46.7%) both in the experimental and the control group. Most of the sample in the experimental group were employed.
and in the control group were self employed (53.3%). In the experimental group 60% of the sample underwent valvular heart surgery and in the control group 46.7% underwent CABG.

### Assessment of pain in post operative open heart surgery patients based on:

#### Intensity of pain:
The majority of the samples in the experimental group (93.3%) and in the control group (100%) had severe pain on post operative day 1.

#### Based on the Behavioural response of pain:
All the samples in the experimental group (100%) and the control group (100%) had moderate level of pain when assessed with observational checklist on behaviour response of pain. And the maximal pain intensity was on the Post operative Day 1 and pain intensity was decreasing over a period of three days. Hence the pain intensity on the third day was lower as compared to the first Post Operative Day.

### Table 1: Mean and standard deviation of subjects based on pain scores

<table>
<thead>
<tr>
<th>Pain</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Pre M 1</td>
<td>7.93</td>
<td>.884</td>
</tr>
<tr>
<td>Post M1</td>
<td>6.53</td>
<td>1.125</td>
</tr>
<tr>
<td>Pre E 1</td>
<td>7.80</td>
<td>.775</td>
</tr>
<tr>
<td>Post E 1</td>
<td>6.20</td>
<td>.941</td>
</tr>
<tr>
<td>Pre M2</td>
<td>6.67</td>
<td>.617</td>
</tr>
<tr>
<td>Post M2</td>
<td>5.00</td>
<td>.756</td>
</tr>
<tr>
<td>Pre E 2</td>
<td>6.33</td>
<td>.724</td>
</tr>
<tr>
<td>Post E 2</td>
<td>4.80</td>
<td>.676</td>
</tr>
<tr>
<td>Pre M 3</td>
<td>5.27</td>
<td>.799</td>
</tr>
<tr>
<td>Post M 3</td>
<td>3.87</td>
<td>.990</td>
</tr>
<tr>
<td>Pre E 3</td>
<td>4.33</td>
<td>.816</td>
</tr>
<tr>
<td>Post E 3</td>
<td>2.93</td>
<td>.594</td>
</tr>
</tbody>
</table>

The findings of the present study shows that there was statistically significant difference based on numerical pain scale (p=0.02) and observational checklist for behavioral response to pain (p<0.01) in the level of pain between the experimental and control group. Thus it implied that foot and hand massage was effective in the reduction of post operative pain in open heart surgery patients.

### Table 2: RMANOVA between the groups based on Numerical Pain scale.

<table>
<thead>
<tr>
<th>Level of pain</th>
<th>F value</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between group</td>
<td>5.87</td>
<td>1</td>
<td>0.02*</td>
</tr>
</tbody>
</table>

*significant

### Table 3: RMANOVA between the groups based on observational checklist for behavioural response to pain.

<table>
<thead>
<tr>
<th>Level of pain</th>
<th>F value</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between group</td>
<td>31.431</td>
<td>1</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*significant
The finding of the present study was supported by a quasi experimental study done by M Shermeh S et al (2009) in Iran to investigate the effect of foot reflex massage on sternotomy pain of patients after coronary artery bypass graft surgery. The result showed that there was significant difference in the mean of pain intensity (p<0.001) with the average of pain intensity in the case group 6.4±2.1 before intervention and 3.4±5.1 after intervention. It was concluded that foot reflex massage was effective on sternotomy pain in patient’s after CABG.\textsuperscript{5}

The present study was also supported by the study done by Hattan J, et al (2002) in London who concluded that foot massage was effective in for promoting the psychological well being and in reducing pain as compared to guided relaxation.\textsuperscript{6}

Another study was done by Wang HL, Keck J in the USA to assess the effectiveness of foot and hand massage on the level of pain in post operative patients. The patients experienced moderate pain even after they received pain medications but the pain was reduced by the intervention that is foot and hand massage, thus supporting the effectiveness of massage in postoperative pain management.\textsuperscript{7}

In the present study, the researcher used two tools one for the measurement of intensity of pain that is Numerical Pain scale and the other one was used for measuring the behavioural response towards pain that is Observational Checklist for behavourial response to pain. Hence, with the effect of hand-foot massage the significant difference in the level of pain was observed between the experimental and control group. Hand-Foot massage not only provides beneficial effects, it also adds an independent nursing intervention and gives a remarkable implication to the nursing service. The Hand-Foot massage can be incorporated as part of the postsurgical protocol which will help in reduction of pain, fewer medications may be needed, providing an added advantage of fewer side effects and acting as an effective adjunct to pharmaceuticals.

CONCLUSION

Conducting research brings out the Evidence Based Practice to expand the existing base of knowledge in the field of nursing. But, it is only through the utilization of those research findings one can bring about a change and an improvement in the quality of care. The finding of the present study reveals that most of the patients have severe post operative pain and hand-foot massage was found to be effective in reduction of post operative pain among open heart surgery patients as there was statistically significant difference in the level of pain between the experimental and control group. Hence, along with the theory, the complimentary therapy like hand-foot massage should be incorporated in the practice field too.

Acknowledgment

I am grateful to Dr. Shirish Borkar, Consultant Cardiovascular and Thoracic Surgeon for granting me the permission to conduct the study.

REFERENCES
