



Original Article

Effects of Early Mobilization on Pain Among Children Post Appendectomy at Children Hospital Lahore

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ABSTRACT

Early mobilization means interval starting with initial physiologic mobilization and continuing through the hospital stay. Mobilization includes the activities that help critical patients to move, and ambulate with or without assistance using a walker and/or support from staff. **Objective:** To assess the effect of Early Mobilization on pain and wound healing among children post appendectomy. **Methods:** A randomized control study was conducted from December 2022 to August 2023 at the Children hospital Lahore. The target population consisted of children undergone appendectomy at Children hospital Lahore. A random sample of n=26 was recruited. Validated tool was used for data collection from participants to assess the pain in the control and interventional group. Initially, Pre-assessment was conducted to obtain pain scores, then the intervention as early mobilization was provided to the interventional group while the control group was observed with usual care. After the intervention in the post assessment, the data were collected from the control and interventional group to compare the effect of intervention. **Results:** The study results revealed that after the intervention, the assessment at 1st follow-up showed somewhat significant difference in control and interventional group scores of pains. A significant mean difference was found on pain between control and interventional group scores at the 2nd follow up where $z(-2.056) =$, $p \text{ value}=0.040$. **Conclusions:** Overall, these findings suggest that early mobilization intervention has a positive and statistically significant impact on reducing mean pain scores.

INTRODUCTION

The most frequent reason for urgent abdominal surgery, the most prevalent cause of acute inflammation in the right quadrant of the abdominal cavity, is appendicitis [1]. Each year, America reports over 250,000 instances of acute appendicitis, whereas England has roughly 40,000 cases [2]. The infected appendix is removed during an appendectomy. The most common type of surgery worldwide is an appendectomy, which is done to lower the risk of perforation [3]. Every year, 700,000 people who needed appendectomies came with appendicitis to the emergency room [4]. According to Almström et al., the prevalence of acute appendicitis has decreased in children under the age of 10, in children aged 5 to 9, in children aged

10 to 14, and in children aged 5 to 9 (from 18.6/10,000 to 6.8/10,000) [5]. Better attention to many etiologically-suggested factors such as hygiene, food and seasonal variation has been widely credited for the declining incidence rates of acute appendicitis [6]. According to reports, boys have an overall risk of acquiring appendicitis of 8.7%, while girls have a lifetime risk of 6.7% [7]. The overall unfavorable appendectomy rate for children is thought to be 8.4%, however the rate has been reported to be as high as 56.7% for children under the age of 12 [8]. Early mobilization among patients in the hospital is associated with improved muscle strength, physical function, and quality of life [9]. Early mobility is defined as

physical activity that is usually implemented within 24 to 48 hours of admission [10]. Early mobilization includes the activities that help critical patients to move, sit on the edge of the hospital bed without back support, sit in a chair after transfer from the hospital bed, and ambulate with or without assistance using a walker and/or support from staff [11]. Early mobilization was found to speed recovery, enhance gastrointestinal and urinary tract function, when its advantages were first noted. Early mobilization techniques include sitting up in bed, getting out of bed, standing up, walking around the room, and doing low-intensity exercise [12]. It is considered an advanced physical therapy to restore musculoskeletal strength and function. Although it is recommended that patients be turned every two hours, additional mobility may be necessary to reduce the risk that immobility poses to the patient [13]. It decreases the likelihood of postoperative recurrence, which reduces expenses of therapy by shortening hospital stays and accelerating the development of functional walking capacity [14]. A fundamental nursing skill that is stressed in nursing school and practiced in the clinical world is moving and walking patients. Even though mobilization is taught in nursing schools, there are more advanced techniques and technological advancements that might alter a nurse's perspective on patient care [15]. According to the study's findings in Pakistan, early mobilization speeds up postoperative recovery and reduces hospital stays without raising the risk of complications like wound infections (p-value 0.00) [16]. Similarly in findings of the study carried out in India, before early mobilization, the average pain level in post-patients after appendectomy was 5.56; after early mobilization, it was 2.50; ($p = 0.000$, $p = 0.000$ 0.5) [17]. According to Horner, postoperative patients should be given as much freedom as possible to roam around in 2018. Increased blood circulation from early mobilization has the advantage of lowering pain, preventing thrombophlebitis, supplying nutrients for wound healing, and enhancing kidney function. Early mobilization is the term used to describe a person's capacity to move freely, easily, and frequently in order to meet the demands of a healthy life [18]. Inadequate mobilization, which prevents circulation from supplying the incision area with the nutrients it needs to repair cells, is one of the factors that contributes to the length of hospital stays and, ultimately, can have an impact on the increase in the cost of care and the impact of hospitalization [19].

The aim of this study was to assess the effect of Early Mobilization on Pain and wound healing among Children post Appendectomy.

METHODS

A randomized control trial (RCT) was conducted at Children Hospital Lahore Punjab. Early mobilization is independent variable and pain is dependent variable. Early mobilization was given to intervention group of post appendectomy patient, and control group was given to routine nursing care. Pain was measured in 1st and 2nd assessment. It was observed through pain scale. Permission was granted from Research Ethics Committee (REC) of University of Lahore (UOL) with Ref No: REC-UOL-445-07-2023. Permission was taken from head of the study setting. The study was conducted from December 2022 till August 2023. The Study population consisted of children age 8 to 12 years (Both male and female), operated under general anesthesia and out of effects within 45 minutes, undergoing the surgery of open appendectomy. Those patients who were having cognitive dysfunction, serious chronic diseases or operated with Laparoscopic appendectomy were excluded from the study. An unbiased sample consisting of twenty-six participants was gathered for both the intervention and control groups. G Power software was utilized to calculate the sample. $Z=1.96$ was used to calculate the sample size (n), which is 26 cases each with a 95% confidence interval and a 5% (0.05) margin of error., Mean 1=1.8, mean 2=3.00, $\delta_1= 1.74$ and $\delta_2= 1.27$. Sample size was confirmed by following formula

$$n = \frac{(Z_{1-\beta} + Z_{1-\alpha/2})^2 + (\delta_1^2 + \delta_2^2)}{(\mu_1 - \mu_2)^2}$$

In the intervention group, early mobilization was initiated, four hours following surgery by requesting the child to dangle their legs, stand beside the bedside for a short period of time, and then walk three times daily as per this study aim. The child at least made it down the corridor. The distance walked was adjusted in accordance with the child's tolerance and measured in minutes using a hand watch before tool I was used to gauge pain perception. Until the patient was discharged from the hospital, whichever came first, this intervention was carried out. The children were advised to sit in a chair for two hours the day of surgery, and for at least six hours each day until they are admitted to the hospital. Following the execution of the intervention, at the time of discharge (post assessment I), and later at the initial first follow-up (Post assessment II), pain perception was evaluated. Following data collection, SPSS version 21 was used to enter and analyze the data. The means \pm standard deviations were used to represent the quantitative variables. Frequency and percentages were used to display the qualitative variables. The non-parametric Mann Whitney U test was employed because the pain data were not normally distributed.

RESULTS

Table 1 presents an overview of the gender and age variable, where the distribution of the surveyed individuals shows very much similar representation, both in control group and intervention group where in control group males were n=12 (46.1%) and females were n=14 (53.85%) where as in intervention group males were n=9 (34.6%) and females were n=17 (65.4%). Moreover, the average age for the control group was 9.42 years; the average age of the interventional group was 9.62 years. Participants in both groups might be as young as 8 years old or as old as 12 years old, for a total of 4 years.

Table 1: Gender and Age Findings of Control group (n=26) and interventional group(n=26)

Demographic characteristics	Control F (%)	Interventional group F (%)
Male	12 (46.15%)	9 (34.6%)
Female	14 (53.85%)	17 (65.4%)
Age in years	Mean Age	Range age
Control Group	9.42	4
Intervention Group	9.62	4

Demographic

Table 2: Comparison of control versus intervention pain assessment score

Value	Score Label	Control (Mean Rank)	Interventional (Mean Rank)	Z test	p-value
Pain Assessment	Pre-Assessment	24.96	28.04	.761	0.447
	1 st Follow-up Assessment	29.79	23.21	-1.662	0.097
	2 nd Follow-up Assessment	30.42	22.58	-2.056	0.040

Effect of early mobilization on pain

Mann Whitney U test with $p < .05$ value as significant

Mann Whitney U test was used to evaluate the effect of early mobilization on pain among children underwent appendectomy. There was no significant different between the control and intervention groups in pre assessment z (.761) and p value 0.447. A significant mean difference was found on pain between control and interventional group scores at the 2nd follow up where $z(-2.056) =$, p value=0.040

DISCUSSION

In the present research, the control group had an average age of 9.42 years, whereas the interventional group exhibited an average age of 9.62 years. Participants in both groups had an age range spanning from a minimum of 8 years to a maximum of 12 years, resulting in a 4-year age span. Non similar findings were found in a past study where the median age of the participants was 12 years ranging from 6-17 years among the study participants [20]. In a previous research study, in contrast, about 33.3% of the control group fell within the age categories of 6 to less than 9 years and 9 to less than 12 years. These disparities between the two groups were not considered statistically

significant, as indicated by a p-value of 0.206 [21]. The gender distribution of the surveyed individuals shows very much similar representation, both in control group and intervention group where in control group males were n=12 (46.1%) and females were n=14 (53.85%) where as in intervention group males were n=9 (34.6%) and females were n=17 (65.4%). Similar results were observed in a previous study conducted in Tanjung Karang, Indonesia. In the experimental group, 37.5% were males (6 individuals) and 62.5% were females (10 individuals), while in the control group, 43.5% were males (7 individuals) and 56.5% were females (9 individuals) [22]. In another past study, within the control group, 52.6% were females (20 individuals), and 47.4% were males (18 individuals). In the intervention group, 49.1% were females (27 individuals), and 50.9% were males (28 individuals) [23]. In a previous study, the control group consisted of 54% males, while the intervention group had 61% males [24]. The study's findings revealed that in the pre-assessment phase of the control group, 6 participants (23.1%) reported mild pain, 18 participants (69.2%) had moderate pain, and 2 participants (7.7%) experienced severe pain. In the second assessment, pain scores decreased, with 6 participants (23.1%) still reporting moderate pain, while the majority of 20 participants (76.9%) had mild pain. During the third assessment, pain levels decreased further, with no participants in the severe or moderate pain categories, and the majority of 21 participants (80.8%) reported mild pain, while 5 participants (19.2%) reported no pain at all. In the interventional group, initially, only a few participants, 3 individuals (11.5%), had mild pain scores, while 22 individuals (84.6%) reported moderate pain, and 1 individual (3.8%) experienced severe pain. Following the intervention, 19 children (73.1%) had mild pain scores, and 7 children (26.1%) had no pain at all. According to a past study after the intervention, the mean pain intensity was 12.69 in the experimental group and 20.31 in the control group. It's also important to note that the p-value was and the Z score was -2.438 was found to be 0.015. In a prior study, data analysis involved the use of a T-dependent test with a significance level of 95% ($p=0.05$). After the introduction of early mobilization, the T-dependent test analysis revealed a highly significant difference between the initial assessment and the subsequent assessment ($p=0.000$). The study's results suggested that early mobilization had a significant impact on the rate of change in pain levels [25]. Findings from a previous study indicated that, before the intervention, the mean pain intensity varied from a high of 7 down to a minimum of 5. This mean pain intensity in the experimental group dropped to a minimum of 2 and a maximum of 5 after the intervention. Interestingly, the Z score was measured at -3.601, and the associated p-value

was 0.000 [22]. In 2022, the average pain intensity of the respondents at General Ahmad Yani General Hospital in Metro City, Lampung Province, was 3.12, with a standard deviation of 9.57. In contrast, the average level of pain in the control group was 3.93, with a 6.80 standard deviation. Both the experimental and control groups experienced generally favorable average pain intensity following the intervention. It is noteworthy, however, that the experimental group experienced a greater reduction in average pain intensity than the control group. Early mobilization offers advantages such as enhanced blood circulation, leading to pain reduction, thrombophlebitis prevention, provision of nutrients for healing in the affected area, and better kidney function [26, 27]. The present study's findings are consistent with a study conducted in 2020 by Daud et al., entitled "The Effectiveness of Mozart Music Therapy in Decreasing Pain Intensity among Post-Fracture Surgery Patients" [28]. A p-value of 0.001 was obtained from their analysis using a non-parametric statistical test (Wilcoxon) with a 95% confidence level ($\alpha=0.05$). Consequently, it can be said that Mozart's therapy successfully lessens pain intensity in patients undergoing post-fracture surgery because the p-value is higher than the significance level ($0.001 > 0.05$).

CONCLUSIONS

Overall, these findings suggest that early mobilization intervention has a positive and statistically significant impact on reducing pain course of follow-up assessments in the intervention group. A meaningful difference in mean pain scores between the control and interventional groups became evident during the 2nd follow-up assessment. This was reflected in the statistical analysis, where the Z-score was calculated at -2.056, and the associated p-value was 0.040.

Authors Contribution

Conceptualization: FM

Methodology: MA

Formal analysis: HS

Writing-review and editing: FM, MA, HS, GMUD

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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