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Research Article

Prevalence and Factors Affecting Postsurgical Pain in Pediatric and Adolescent Patients

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ABSTRACT

Background: Post-surgical pain (PSP) can persist from the immediate post-operative period up to 6 months following surgery. The purpose of this study was to evaluate the prevalence of PSP and identify factors influencing its intensity in pediatric and adolescent patients.

Methods: This cross-sectional study included 120 patients aged 3-17 years who had undergone surgery in hospitals. The data for this study were collected by reviewing patients' clinical records and observing patient behavior. The FLACC scale was used to assess pain in children, and the APPT scale was used to assess pain in adolescents. Demographic data extracted from patients' clinical records, along with pain data from the FLACC and APPT scales, were entered into SPSS 20 software, and data analysis was performed.

Results: The study included 120 patients with a mean (SD) age of 11.21 (4.03) years, of whom 64 (53.3%) were female. Regarding pain severity in the pediatric group, 2 (3.3%) reported no pain, 14 (23.3%) reported mild pain, 30 (50%) reported moderate pain, and 14 (23.3%) reported severe pain. In the adolescent group, 2 (3.3%) reported no pain, 7 (11.7%) reported little pain, 12 (20%) reported medium pain, 15 (25%) reported large pain, and 24 (40%) reported the worst possible pain. There was no statistically significant relationship between pain status, type of surgery, and gender in either the pediatric or adolescent group ($P > 0.05$).

Conclusion: Given the high reported rates of post-surgical pain in pediatric and adolescent patients, targeted interventions are recommended to mitigate pain severity and improve patient outcomes.

Introduction

The experience of pain in patients is accompanied by vital inhibition, suffering, and fear, which all people, including the individual, family, society, and healthcare staff, strive to reduce [1-2]. Control and lack of proper management of pain can lead to dissatisfaction in the patient or the patient's family, inappropriate behavioral changes, physiological changes, reduced quality of life, and short-term and long-term effects on emotional and cognitive well-being in the child [3-5]. Acute pain is a type of pain that usually occurs within a few days after surgery, and its duration is limited [6].

Surgery is a significant cause of pain. A substantial number of children worldwide undergo surgical procedures annually, and this figure is also high in Iran. Despite the prevalence of pediatric surgeries, the impact of surgery on children's health and potential complications remains understudied [7-8]. Post-surgical pain (PSP) can persist from the immediate post-operative

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period up to 6 months following surgery. Therefore, identifying factors that influence pain and implementing appropriate pharmacological and non-pharmacological interventions to manage pain are crucial [9-10]. Patient-related factors such as age and gender, as well as surgical factors like duration and type of surgery, can influence PSP. Given the potentially lower pain tolerance in pediatric patients, identifying these contributing factors is particularly important [11-12].

Children may undergo various types of surgeries due to emergency or non-emergency events. These surgeries encompass tonsillectomy, orthopedic procedures, neurosurgery, abdominal surgery, urologic procedures, and other pediatric surgical interventions, each associated with varying durations and intensities of post-operative pain [13-15]. Tonsillectomy, in particular, is characterized by a high prevalence of post-operative pain, with patients experiencing pain both in the hospital and at home throughout the typical 14-day recovery period. Recovery after tonsil surgery is accompanied by pain, and high levels of pain are experienced by all age groups undergoing the procedure [13, 16-17]. In orthopedic surgeries, patients experience severe pain, leading to a very high demand for narcotics, which raises concerns in the pediatric group [14].

Inadequate postoperative pain relief causes exacerbation of postoperative pain, which is followed by a delay in recovery and a delay in the patient's discharge from the hospital [18]. One of the necessary conditions for pain relief is to identify the severity and factors affecting pain in patients based on the patient's demographic variables and the type of surgery [19-20]. The aim of this study was to determine the amount of PSP and the factors affecting it in pediatric and adolescent patients.

Methods

In this cross-sectional study, we included 120 patients aged 3-17 years who had undergone surgery in hospitals in Ilam. The voluntary participation or non-participation of children in the study was explained to the parents or companions of the patients, and their consent to participate in the study was obtained.

Patients aged 3-11 years were included in the Childhood group (N=60), and those aged 12-18 years were enrolled in the Adolescence or pediatric age group (N=60) [21]. The study excluded patients with underlying diseases that affect pain perception and behavior, those who had outpatient surgery, and those with incomplete information.

Data for this study were collected through examination of patient clinical records (for age, gender, and type of surgery) and direct observation of patient behavior. Pain assessment was performed using the FLACC scale [22-23] for children and the APPT scale [24-26] for adolescents.

FLACC Scale

In this tool, pain is assessed in 5 states with a score of 0-2, and its results include the intensity of pain, which is divided into no pain (zero score), mild pain, moderate pain, and severe pain. The FLACC Scale score is divided from zero, meaning no pain, to 10, meaning severe pain [22-23].

Adolescent Pediatric Pain Tool (APPT) Scale

In this tool, which assesses the pain of patients aged 7-17, the intensity was divided into five areas, including no pain, little pain, medium pain, large pain, and worst possible pain [24-26].

Researchers entered data related to demographic information extracted from the patients' clinical records, along with data on pain from the FLACC and APPT tools, into SPSS 20 software for analysis.

Results

The study included 120 patients with M(SD) in the age range of 11.21 (4.03), of which 64 (53.3%) were female. In terms of type of surgery, most surgeries were in the ENT surgery group with 39 (32.5%) and abdominal surgery with 32 (26.7%) (Table 1).

In the pediatric group, results indicated that 2 (3.3%) patients experienced no pain, 14 (23.3%) experienced mild pain, 30 (50%) experienced moderate pain, and 14 (23.3%) experienced severe pain. Statistical analysis revealed no significant association between pain status, type of surgery, and gender within this group ($P > 0.05$) (Table 2).

For the adolescent group, the findings showed that 2 (3.3%) patients experienced no pain, 7 (11.7%) reported slight pain, 12 (20%) reported moderate pain, 15 (25%) reported considerable pain, and 24 (40%) reported the worst possible pain. Similar to the pediatric group, no significant relationship was found between pain status, type of surgery, and gender ($P > 0.05$) (Table 3).

Table 1- Demographic characteristics of patients

Variable		Pediatric, N (%)	Adolescents, N (%)	Total, N (%)
Gender	Male	26(43.3)	30(50)	56(46.7)
	Female	34(56.7)	30(50)	64(53.3)
Type of surgery	Neurologic	2(3.3)	4(6.7)	6(5)
	Orthopedics	13(21.7)	8(13.3)	21(17.5)

	Ear, nose and throat surgery (ENT)	16(26.7)	23(38.3)	39(32.5)
	Urological	9(15)	10(16.7)	19(15.8)
	Abdominal	18(30)	14(23.3)	32(26.7)
	Other	2(3.3)	1(1.7)	3(2.5)
Age	M(SD)	7.55(1.83)	14.88(1.46)	11.21(4.03)

Table 2- Pain status in Pediatric by gender and type of surgery

Variable		No pain N (%)	Mild pain N (%)	Moderate pain N (%)	Severe pain N (%)
Pain score		2(3.3)	14(23.3)	30(50)	14(23.3)
Gender	Male	1(1.66)	8(13.33)	12(20)	5(8.33)
	Female	1(1.66)	6(10)	18(30)	9(15)
Type of surgery	Neurologic	0(0)	0(0)	1(1.66)	1(1.66)
	Orthopedics	0(0)	4(6.67)	7(11.67)	2(3.33)
	Ear, nose and throat surgery (ENT)	1(1.66)	3(5)	8(13.33)	4(6.67)
	Urological	0(0)	2(3.33)	6(10)	1(1.66)
	Abdominal	1(1.66)	5(8.33)	8(13.33)	4(6.67)
	Other	0(0)	0	0	2(3.33)

Table 3- Pain status in adolescents by gender and type of surgery

Variable		No pain N (%)	Little Pain N (%)	Medium Pain N (%)	Large Pain N (%)	Worst Possible Pain N (%)
Pain score		2(3.3)	7(11.7)	12(20)	15(25)	24(40)
Gender	Male	1(1.66)	4(6.67)	9(15)	9(15)	7(11.67)
	Female	1(1.66)	3(5)	3(5)	6(10)	17(28.33)
Type of surgery	Neurologic	0(0)	0(0)	2(3.33)	2(3.33)	0(0)
	Orthopedics	0(0)	0(0)	1(1.66)	1(1.66)	6(10)
	Ear, nose and throat surgery (ENT)	2(3.33)	2(3.33)	5(8.33)	7(11.67)	7(11.67)
	Urological	0(0)	3(5)	2(3.33)	4(6.67)	1(1.66)
	Abdominal	0(0)	2(3.33)	2(3.33)	1(1.66)	9
	Other	0(0)	0(0)	0(0)	0(0)	1(1.66)

Discussion

According to the findings, in the pediatric group, 30 (50%) were in the moderate pain range and 14 (23.3%) were in the severe pain range. Also, in the adolescents group, 15 (25%) were in the large pain range, and 24 (40%) were in the worst possible pain range. In the study by Mekonnen et al., the PSP status was evaluated in 153 children using the FLACC scale, of whom 77.1% were between the ages of 6 and 12 years and 102 of them were male. According to the findings, 46 (54.1%) of the patients had moderate to severe pain, and 39 (45.9%) of the patients had none to mild pain. Also, 85 (55.6%) of the patients had pain, and 68 (44.4%) of the patients had no pain. On the other hand, pain was reported in 45 (29.4%) patients in orthopedics, 55 (35.9%) in abdominal, 17 (11.1%) in neurologic, and 36 (23.5%) in other patients [27]. In the study by Power et al., the PSP status was evaluated on the second day after discharge and also from 1 to 4 weeks after surgery in patients aged 2-12 years, and 93% of the children had pain. The reasons for the patients' surgery included 39 (30%) due to ENT surgery, 47 (36%) due to general surgery, and 45 (34%) due to urology surgeries. Also, regarding the classification of pain, 26% (33) had moderate pain and 33% (43) had severe pain [28].

A review study by Rabbitts et al. found that the pain rate 12 months after surgery in the age group of 6-18 years was 20%. There was also a relationship between pain and medical and biological factors [12]. Also, in other studies, PSP status was assessed. So, in the study by Carreon et al., the mean (SD) pain score was 4.35 (.61) with the SRS-22 pain domain tool [29], and in the study by Lillehei et al., the mean (SD) pain score was 87.2 (13.8) with the SF-36 bodily pain tool [30]. On the other hand, in the study by Batoz et al., the most common type of surgery was orthopedic surgery, with a rate of 164 (63.6), followed by laparotomy/scopy, with a rate of 33 (12.8), and the CPSP rate in patients was reported to be 10.9%. Additionally, 89.1% of patients reported mild pain, 7% reported moderate pain, and 3.9% reported severe pain [31].

Conclusion

Given that the reported rate of PSP in pediatric and adolescent patients has been high, necessary interventions are recommended to reduce the severity of pain in these patients.

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