

The Effect of Establishing an IV Access Team on the Pain Caused by IV Line Placement in Children with Cancer

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Abstract

Background: Pain is an unpleasant sensory and psychological experience. Invasive procedures such as Intravenous (IV) line placement and blood sampling are a major source of pain and fear in hospitalized children. Pain control is one of the important nursing measures. The present study aimed to determine the effect of setting up an IV Access team on reducing pain intensity in children with cancer aged 5 to 7 years.

Methods: This descriptive study was conducted on children hospitalized in the hematology department of Dr. Sheikh Children's Hospital in Iran from 21 July to 21 September 2024. 67 children were selected using a census and purposive sampling method. The data collection tool was the FLACC Pain Scale.

Results: A total of 67 IV line placements were performed in 53 patients. 40 were boys (75.47%) and 13 were girls (24.52%). The number of IV line placements performed by the IV access team was significantly higher in boys (47 cases) than in girls (20 cases). The results of the severity of children's behavioral reactions to pain showed that 7% experienced mild pain, 12% had moderate pain, 37% showed severe pain, 29% reflected very severe pain, and 15% exhibited the worst pain.

Conclusion: Despite the implementation of the IV Access team, no significant reduction in pain severity was observed, suggesting the need for further investigation into alternative pain management strategies.

Key Words: Cancer, FLACC, IV access, Pain, Pediatric.

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1- INTRODUCTION

Childhood cancer poses a significant challenge for the patient, their family, and the healthcare team (1). According to the Iranian Pediatric Blood and Cancer Society, 2,500 children under the age of 15 are diagnosed with cancer in Iran every year (2). Despite the use of intensive treatment protocols that have led to improved survival rates for childhood cancer in developed countries, these intensive and prolonged treatments are associated with significant side effects such as pain (3). Children with cancer undergo numerous painful procedures, such as those related to surgery, chemotherapy, and tests like bone marrow aspiration, needle puncture, or lumbar puncture (2).

Children can become irritable, excited, and restless in response to pain. They may also have nightmares, sleep disturbances, and eating disorders. Children with unrelieved pain may feel victimized, depressed, isolated, and lonely. Parents of these children may also feel angry and distrustful of the treatment system (4).

Pain from needles used for IV line placement and blood sampling is a major cause of pain and anxiety for hospitalized children (5). Fear of needles can lead to reduced or non-cooperation from the patient, failure of the IV line placement process, and can also prolong the overall treatment process (6).

Reducing pain during routine procedures such as inserting an angiogram or intravenous injections is effective in improving patient satisfaction with treatment and care (7). Therefore, it is crucial to find appropriate methods for pain control during the insertion of a catheter or needle into a vein (6). The effectiveness of numerous pharmacological and non-pharmacological methods has been investigated to reduce pain caused by procedures (8). However,

multiple attempts to gain IV access may increase children's stress and anxiety despite the use of local anesthesia and various pain control methods, such as distraction techniques (9). Multiple attempts to gain IV access reduce patient and staff satisfaction while increasing pain, bruising, and the risk of infection (10).

Katsogridakis et al., identified success rates for multiple attempts for hospitalized children ranging from 23% for physicians, 44% for nurses, to 98% for IV access nurses. The average time required for peripheral IV cannulation was reported to be 2.5 to 13 minutes, with difficult IV access requiring up to 30 minutes (11). Difficult intravenous access is detrimental to the patient experience and is associated with restlessness, needle phobia, skin infections, bruising, and delays in medical treatments such as fluid resuscitation and pain management. Implementing a dedicated IV access team can significantly reduce the time required to obtain IV access for critical diagnoses and medical interventions (10). The aim of the present study was to investigate the positive effect of setting up an IV access team for IV line placement on reducing pain intensity in children with cancer.

2- METHODS

This descriptive study was conducted on children aged 5 to 7 years who were admitted to Dr. Sheikh Children's Hospital in Iran in 2024 between June 21 and September 21. Sampling was done using a census and purposeful method, and a total of children with acute lymphoblastic leukemia (ALL) were studied. The IV access team consisted of 5 chemotherapy ward staff. Inclusion criteria included admission to a pediatric hematology ward and age between 5 and 7 years. All patients had a history of hospitalization for a period of one month. Patients studied had no underlying diseases and the use of any medication that could alter the child's

consciousness or pain during the research would result in exclusion from the study. Samples who were unable to cooperate for any reason were also excluded from the study. The instrument used in this study was the FLACC (Face, Legs, Activity, Cry, Consolability) scale, which scale is a suitable tool for assessing pain-related behaviors in children aged 2 months to 7 years (12). The scientific validity and reliability of this tool have been studied and confirmed by various researchers (12-14). An internal study by Sadeghi et al. confirmed the face and content validity of the FLACC scale, and its reliability was acceptable (15). A study conducted by Willis et al. to assess the validity of the scale concluded that it is suitable for children between 5 and 7 years old (16). Therefore, in this study, children in the age range of 5 to 7 years were examined. Using the FLACC pain instrument, which consists of 5 sections rating the intensity of pain according to facial reactions, leg position, mobility, crying, and relaxation. The total pain score ranges from (0 (no pain) to 10 (severe pain) and is the sum of the scores for the different sections (15).

During the presence of trained members of the IV ACCESS team, necessary

explanations were given to parents and children for the purpose of IV line placement, and verbal consent was obtained. The results of this study were reported in the form of frequency and percentage in tables and graphs using EXCEL software.

3- RESULTS

During the three-month study period, the IV Access team performed a total of 167 IV line placements, with 67 of them being in children aged 5-7 years. The study included 53 subjects, with 40 boys (75.47%) and 13 girls (24.52%). Figure 1 shows the distribution of IV Access cases by gender. Accordingly, the number of IV line placements performed by the IV Access team in boys (47 cases) was significantly higher than in girls (20 cases).

The results of the study on the severity of children's behavioral reactions to pain are shown in Figure 2. Accordingly, 7% of patients experienced mild pain. In the patients studied, IV line placement by the IV access team caused 12% to feel moderate pain, 37% to feel severe pain, 29% to feel very severe pain, and 15% to feel the worst pain.

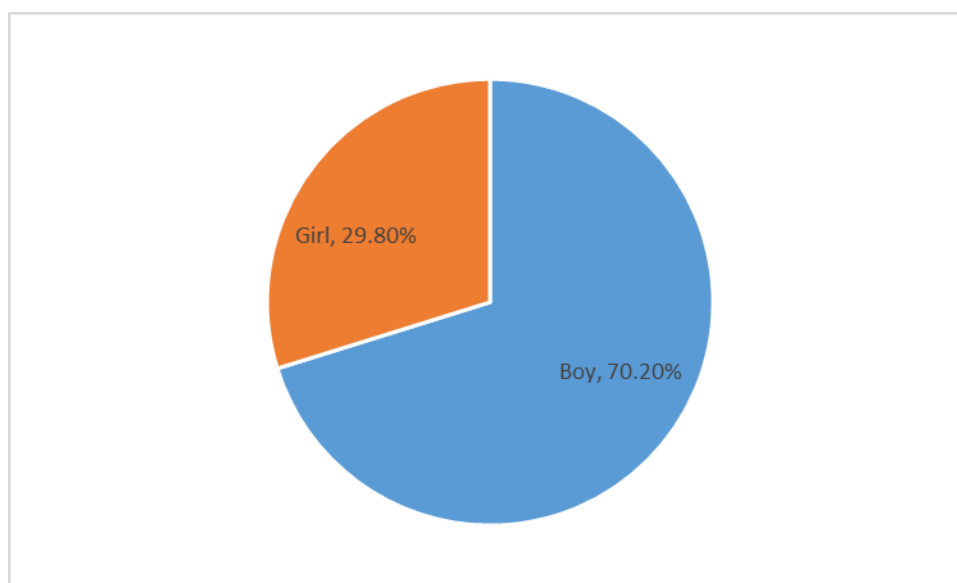


Figure-1: Frequency distribution of IV Access uses by gender

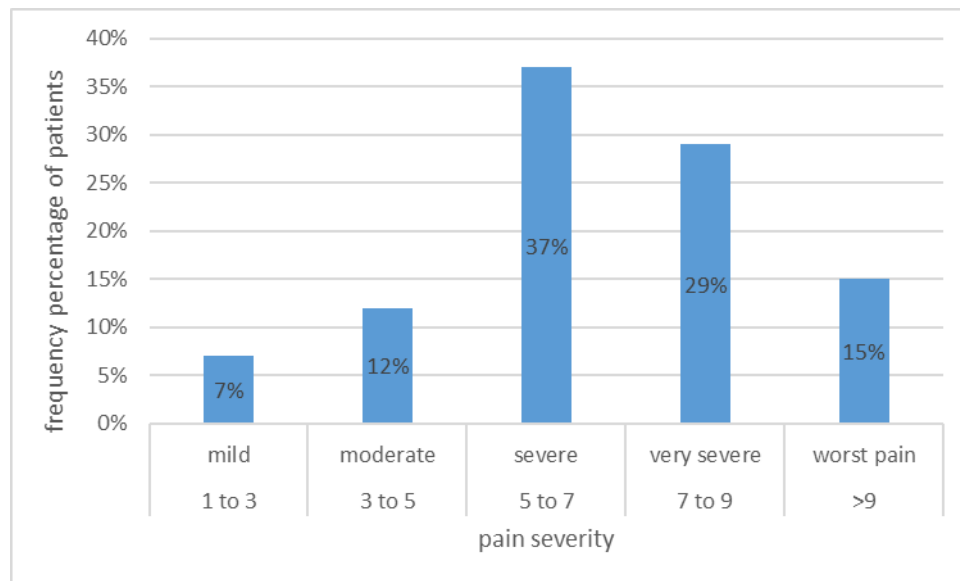


Figure-2: Frequency distribution of pain intensity in children with cancer who underwent IV line placement by the IV Access team.

4- DISCUSSION

According to ethical principles, a sick child should not be harmed during care. Therefore, healthcare providers should pay great attention to this important issue (17). Despite understanding the importance of pain and while pain has been identified as the most important cause of human suffering, pain from injections in children is generally less well-regarded (18). Injections cause severe pain, anxiety, and stress, and the inability to reduce the associated pain causes children to be less cooperative (19). Since pain assessment is an important part of the nursing process and the nurse must consider the child's comfort and well-being as a basic need, it is recommended that nurses use various methods to reduce and relieve pain in children (20).

The results of the present study show that the IV access team's efforts to reduce pain intensity in children were only effective in 19% of the study subjects, with 71% of the children experiencing severe or more severe pain. In this regard, the effect of the age group of the study subjects should not be overlooked. As Potter and Perry consider age to be one of the factors

affecting pain perception in individuals (21). Urden et al. also stated that the pain threshold in children and elderly people is lower than in other individuals, and as a result, the perceived pain intensity in these people is higher than in other individuals (22). Arts et al. have stated that regardless of the effect of the type of intervention, younger children have reported significantly more pain and have shown a greater behavioral response (23).

In a study investigating the severity of pain from IV line placement in children with thalassemia, 18.3% of participants reported mild pain, 32.5% moderate pain, and 49.2% severe pain (24). Among the factors affecting the difference in pain intensity estimated in different studies, we can mention the difference in nurses' knowledge about children's pain assessment tools and their experience in using these tools (25). It should also be noted that many factors affect children's pain expression, including the level of mental development and age, the condition or process that caused the pain, gender, culture, personality, temperament, previous experiences, parents' reaction to children's pain, and the type of pain (acute or chronic) (24).

Regarding the limitations of the present study, we can point out factors such as individual differences in pain threshold, as well as cultural, social, and psychological factors of children. These factors were beyond the control of the researchers in the present study.

5- CONCLUSION

Although IV line placement does not take more than a few minutes, it can be very painful for children. Given the conditions of children with cancer, the fear of IV line placement and the pain it causes are always with them. In the present study, pain assessment was performed based on children's behavioral reactions and showed that the IV access team's efforts were effective in only 19% of cases. Given the greater sensitivity of children to pain, which can affect the intensity of their reaction to pain, it is recommended that other pain assessment criteria such as physiological criteria (heart rate and respiratory rate), color spectrum, and other numerical scales be used in future studies instead on behavioral reaction criteria.

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