

The Role of Nursing in the Epidemiology and Management of Painful Procedures in Children in Saudi Hospitals

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Abstract

Painful medical procedures are common in pediatric healthcare settings and pose significant challenges for both children and healthcare professionals. This study explores the role of nursing in managing painful procedures for children in Saudi hospitals, focusing on the epidemiology, management strategies, and the impact of these procedures on children's physical and emotional well-being. The research highlights the importance of nurses in assessing and alleviating pain, employing non-pharmacological interventions, and involving family members in the care process. The study also identifies barriers in pain management, such as institutional constraints, cultural factors, and emotional responses from both children and parents. The findings emphasize the need for improved nursing practices, interdisciplinary collaboration, and ongoing research to optimize pain management in pediatric settings. Recommendations for future practice include developing culturally sensitive training programs and integrating evidence-based guidelines into routine clinical care.

Keywords: Pediatric pain management, painful procedures, nursing care, child healthcare, pain assessment, non-pharmacological interventions, emotional impact, cultural barriers, Saudi Arabia, nursing practices, interdisciplinary collaboration, pediatric pain research.

1. Introduction

Painful medical procedures are invasive and unpleasant experiences that challenge pediatric nursing staff on an episodic basis. Nurses play a pivotal role in advocating the best care for their patients, offering physical care, prevention of pain, and supporting the comfort of those who are suffering. Nurses are an important source of information on incidence, management, and factors influencing patient comfort. There are cultural, management, institutional, and professional factors that influence the inclusion of nursing evidence on physical care. The aim of this study was to assess the epidemiology and identify the current evidence base regarding the management of painful medical procedures in pediatric hospitals. The findings may fill an important gap, as no research data exist regarding the deal of nursing-preferred practices for painful procedures in hospitals.

The administration of painful procedures is a part of nursing in hospitals that is dominated by clinical trials and often unplanned. Nurses must have updated knowledge to implement them professionally and effectively. Children have a right to health maintenance, restoration, cure, and consumption of palliative medications with the least suffering possible. Therefore, this study aims to summarize the evidence, if available, about the nursing perspectives in epidemiology and preferred practices of painful medical procedures in children in hospitals. It addresses patterns in the practices of pediatric health care related to managing the painful medical procedures within the examination for which children are referred. Using the

example of hospitals, this paper describes data needed in order to implement an agenda of reducing pain as a strategy for health care for children. That agenda includes children who are receiving health care for the intensity as well as providing health care for those who have discomfort, distress, or pain. Several other domains, such as nursing education, induction on nursing credentialing and certification examinations, and nursing practice must address care for children as well. This aims to improve awareness of this issue in order to stimulate population research. The findings are presented in four ways: by the context of the examination that initiates the painful medical procedure, by the type of force in reconstructive practices, by the location of the painful medical procedures, and by the age of the children. The alcohol involved in the same kinds of exams serves as the basis for each study. (Varndell et al., 2020)(El-Aqoul et al.2020)(Peng et al.2021)(Rababa et al., 2021)(Liyew et al.2020)(Ullsten et al., 2021)(Rababa & Al-Rawashdeh, 2021)(Zelege et al., 2021)

2. Epidemiology of Painful Procedures in Children

The prevalence and incidence of children encountering painful procedures in various healthcare areas ranged from 20% to almost 100% of children. In emergency departments, 47% of children to be cannulated and 37% undergoing venipuncture experienced moderate to severe pain. Other healthcare facilities also report a high percentage of using painful procedures. In pediatric primary healthcare services such as clinics and general practitioners, over one-third of the total of 1,188 children need one or more painful procedures during a six-month period. For ill children, 54% of 262 and 56% of 350 children received negative touch treatment, consisting of palpation of the tender point, during a period of hospital admission or an outpatient clinic visit. The most common destination for a painful procedure seems to be hospitalization, with 100% of children in one out of two studies encountering a painful procedure.

The outpatient clinic is also a location for painful procedures. In one of two surveys, 70% of a total of 122 children had received one or more anesthetic needle injections in a dental outpatient clinic. In Saudi Arabia, children undergoing a painful procedure are nearly always accompanied by a significant other. One or more parents are present in 99% of children needing one or more painful procedures, while siblings are present in 42% of these cases. With regard to the types of painful procedures, peripherally inserted central catheter line insertion and/or removal, venipuncture including cannulation, heel sticks, phlebotomy, dressings, intramuscular injections, urinary catheter insertion and removal, nasogastric tube insertion, electrocardiogram, echocardiogram, sweating tests, and electrodesiccation are most often reported. Following a venipuncture, the making and removing of a venous access is also most often reported, as well as the removal of an intracutaneous bone needle. The diamond-tipped bit associated with coronal tooth drilling triggers the most pain in dentistry. In blood draws, the most painful steps for the children are 'thinking about pain that will result' and 'feeling sudden pulling pain'. (Alotaibi et al.2023)(Saigh & Saigh, 2023)(Alrashoud et al.2023)(Alshatrat et al.2022)(Aldakhil et al.2020)

2.1. Types of Painful Procedures

The potentially painful procedures conducted on pediatric patients can be classified into three major categories: therapeutic procedures, diagnostic tests, and surgery. The type of procedure performed does not accurately predict the child's experience of pain, as pain is variable and depends on a number of factors. However, on average, surgeries tend to be the most painful while diagnostic tests are generally less painful. Of course, some diagnostic tests, particularly those that may need to be undertaken at the bedside, may have elements of both therapy and diagnosis and can also be quite painful. Some procedures are particularly amenable to the systematic study of pain perception and processing, as well as evaluation of the effectiveness of analgesic interventions because they are common and a similar version can be completed on healthy children in a laboratory setting. These procedures include venipuncture, bone marrow aspiration, and subcutaneous catheter placement, among others. (Eccleston et al.2021)(Smith et al.2022)(Xiang et al.2021)(Felemban et al.2021)(El-Tallawy et al.2021)(Lopes-Júnior et al.2020)

There is considerable individual variability in how a given child views different medical procedures. Emotional distress and anxiety are closely related to the estimation of the degree of pain that a procedure will cause. For children, other factors can also play a role. Younger children are more worried by the environment, such as the sight of needles and doctors in white coats, than the pain the medical procedure may cause. Furthermore, medical procedures can trigger traumatic memories of previous medical or other stressful events, precipitating a strong predictor of future anxiety and negative emotional responses to the procedure. Personal preference also plays a large role. Although most children and parents prefer that a painful procedure be over quickly, some parents and children choose to undergo moderate amounts of pain to ensure that a muscle relaxant is available to minimize the amount of any subsequent discomfort. Overall, the study of the neurobiology of pain processing and the psychological responses to painful stimuli suggest

that an effective nursing response to pediatric painful procedures needs to be individualized across patients and cannot be undertaken without some level of patient assessment. (Perry et al.2022)(Eccleston et al.2021)(Loeffen et al.2020)(Romito et al.2021)(Godino-Iáñez et al.2020)(Zengin et al., 2021)

3. Impact of Painful Procedures on Children

Painful referral procedures are common in hospitals, although they are considered daily care that saves children's lives during examination and treatment. Pain experiences have short-term effects by inducing pain and suffering in the child's body, and long-term effects on the child's mental health, including a sense of anger, depression, stress, and an overall decrease in quality of life. These must be managed by "children-focused" pain assessment, intervention, and pain-goals. To help nurses achieve this goal, a principle-based practice is suggested for nurses in managing pain in children, considering the purposefulness of childhood and the burden of pain. It is necessary to understand the burden of pain experienced in the world before trying to understand pain management strategies. Children experience pain more often in the community and the health care system. Painful procedures can be for diagnosis, treatment, and even for analgesia, which generally fills the health care providers' roles, and the lack of person-focused care for those receiving treatment. (Friedrichsdorf & Goubert, 2020)(Harahsheh et al.2021)(Sharp et al.2023)(Ackerman et al.2022) Inadequate pain management has immediate and long-term effects on children, and these concerns need to be respected with adequate interventions on the effects of pain or teamwork on the most efficient strategies to help reduce the burden of pain. Pain management can have the following impacts:1. Acute pain or episodic relapse due to children who are skilled in performing procedures. 2. Daily painful procedures - children will not degrade or avoid the disease, affecting their performance in wrestling and play.3. Anxiety and fear in particular children and adolescents may lead to hospitalization due to the fear of future painful procedures. 4. Burden of pain-care issues for this particular child can be challenging for medical staff to identify.Older children and adolescents often complain of feeling "hit" or "broken." In school, children may complain about "mysterious" symptoms or abnormalities. Those who received effective treatment and improved with the nursing staff were not sensitive to the assessment of the nursing staff and the communication of adults with them, which helped prevent deterioration. These include age, development, stress response, and psychological factors. These effects include irritation, fear, restlessness, aggression, headaches, and sleep disturbances. Pain-filled experiences in children often lead to common behavioral issues. As the initial management of pain is laid out in a calm manner, the relationship improves for diagnosis, injury, and understanding the cause of the child's pain. The pain experience is standard in children and adolescents. In adolescence, health care, surgery, and accidents seem normal and can lead to rough experiences. The daily habit of coping with pain will not make most people aware of how early education is performed. Treatment or daily, similar procedures will likely need assessment to provide for adult children. This will help children experience and express pain with the help of an integrative approach and is beneficial for exploring and solving issues. There is pressure to bring resources and pain care initiatives to support children's short-term and long-term needs. Sometimes we may have normal treatment to manage pain and sometimes plan a separate solution for the added opportunity to address hyperalgesic responses, which can create dependencies that complicate childbirth. This direction provides a "boost" for nursing positions when delivering current nursing care. These results contribute to the immediacy of pain and nurse management. (Eccleston et al.2021)(Friedrichsdorf & Goubert, 2020)(Palermo, 2020)(Gjærde et al.2021)(Abdel et al.2021)(Galloway et al.2020)(Rudnik-Jansen et al.2024)

3.1. Physical and Emotional Consequences

3.1. The Physical and Emotional Consequences Pediatric patients receiving painful procedures may have to face considerable consequences that may affect the course of their illness. Pediatric patients who experienced painful procedures stayed in the hospital until discharge and stayed within a special care unit due for post-operative observation longer than those who did not have painful procedures. Pain may also result in postoperative complications and delays in recovery. Children may have difficulties engaging in normal daily routines such as playing and learning due to their heightened sensitivity, pre-existing pain, temporary physical impairment, and discomfort. They might be suffering from discomfort even after a more uncomplicated surgery. Thus, careful postoperative monitoring is essential. Pediatric patients who remember long-lasting pain related to healthcare interventions show deterioration in functioning, parental perception of behavioral problems, post-traumatic stress disorder symptoms, and traumatic relationships with staff. The distress of pain is associated with the development of traumatic relationships, which result in children receiving fewer effective pain-relieving interventions. Pediatric patients who report higher physiological distress suffer more emotional and functional deterioration, traumatic relationships, high symptom reports, and intrusion compared to those who do not. In summary, pain and distress associated

with pediatric hospital experiences are likely to result in some form of post-traumatic stress disorder response. It is important to note that this response is injury rather than illness-related, with no significant disorders occurring. (Eccleston et al.2021)(Friedrichsdorf & Goubert, 2020)(Gold et al.2021)(Ding et al.2020)(Wong et al.2021)(Brockington et al.2021)(Romito et al.2021)

4. Current Nursing Practices in Pain Management

Nurses in clinical practice working in pediatric settings are concerned with conducting day-to-day pain assessments and pain as an outcome of care for children undergoing painful procedures. They believe in the use of assessment tools such as the Face, Legs, Activity, Cry, Consolability (FLACC) scale, and also use a variety of non-pharmacological approaches to alleviate pain. Common practices include distraction and relaxation techniques, together with the presence of parents or music before and during the procedure to help alleviate the child's pain. Other strategies aimed at alleviating pain include the presence of nursing staff, the involvement of the multi-professional team, and the provision of information about the procedure and support for the child and family.

Pain assessment: Adolescents' and children's pain levels are usually evaluated by verbal self-reports, faces, or by using an appropriate pain scale. Subject-specific tools are used in the assessment of the infant special population. The verbal pain assessment tool uses a scale of 0–10, which compares the child's degree of pain. Some nurses might depend on an increase in facial intensity on the FACES pain scale to allow some children to bear the amount of pain. An example of this is the use of the faces visual analogue of sorrow, which may show an upsurge of eyebrow movement, while toddlers or younger children may change from a calm smile to a frown. The majority of nurses depend on an evaluation of the experience of pain through physiological reactions by assessing the physical signs, which can include an increase in heart rate, increase in blood pressure, dilated pupils, and increased respiratory rate and intracranial pressure. (Nagarwal et al.2022)(Adeboye et al.2021)(Korving et al.2020)(Lotan & Icht, 2023)(Dildine, 2022)

4.1. Assessment and Documentation

4.1.1. Assessment The outcomes of the assessment provide valuable evidence to assist in formulating a management plan for pain in any procedure. Effective and comprehensive pediatric pain management relies upon accurate assessment of the child's pain intensity and the impact of any procedure, including vaccination. It is recommended that doctors avoid causing additional pain by choosing the appropriate, least painful available intervention to address the specific health care need, with an additional duty of continuous clinical assessment and immediate interventions to alleviate pain and suffering. Nurses play a vital role in this quality control and caring role, which has been recognized globally.

Various tools are available to assess pain during a procedure; several are listed in a table. When a faces pain scale is used, younger children need to be able to count and discern quantities. Proposals and investigations have evaluated several tools. Ultimately, however, the outcome is reliant upon our observational skills, communication with the child and parent, the assistance of a play specialist, and the time available to assess the child. All nurses are familiar with patients who underreport or overreport their pain. It has been shown that an individual's pain report correlates with the severity of their pain. Unfortunately, a significant percentage of nurses fail to chart the 'pain history' in the patients' clinical records. When pediatric procedural pain is underreported and not subjected to observational pain management or regular assessment, there is a heightened potential for repeated procedural pain. 4.1.2. Documentation Documentation is a legal procedural requirement that provides a way of monitoring how pain (and any associated symptoms related to a procedure) impacts a child and their family over a designated period. Recording procedures with a comparative visual scale will validate and support complaints of pain and anxiety during procedures. This tool also allows 'trends' to be recorded and comparisons to be made between various procedures and treatments, i.e., local anesthetic creams, consequences of lack of time to prepare the child, and the time spent bothering the patient/parents before, during, and after the procedure. Alternatively, if an intervention to reduce pain and anxiety is implemented, this may also be reflected upon and evaluated. Staff in the department found documentation recording the impact on the child and family every year in research and development for three years and then three successive patient surveys. Setting standardized assessment techniques should form the basis of all policy and procedures for dealing with children having painful procedures. Standardization of the substantive content of the techniques will improve the validity of the conclusions.

5. Challenges and Barriers in Pain Management

There are numerous challenges and barriers facing nurses in their efforts to alleviate pain in pediatric patients during painful procedures. These barriers can be grouped as institutional, cultural, and psychosocial. The first level is associated with organizational factors such as lack of resources in terms of

pain and procedural pain management guidelines and tools, difficulties in incorporating pain assessment and management in daily practice, and time constraints. The second level is more cultural and reflects the effects of cultural factors, where pain is often considered a part of children's lives and not to be avoided. This is due to religious beliefs and socio-cultural factors. The third level relates to child and family emotional responses. Parents, especially mothers, become anxious when their children are in pain and may exhibit guilty feelings because they could not protect their children. Child responses would include feelings of loss of control, frustration, defiance, and at times aggression. Addressing nurse barriers is a fundamental step leading to the development of more professional nursing practices in the management of children's pain.

Nurses need to be trained and educated on the significance of pain assessment and management. Multidisciplinary efforts are also needed to address these barriers. It is well known that there are numerous barriers facing nurses in pediatric pain management and in some health facilities; nurses have limited knowledge of and access to protocols necessary to manage pain. Nurses' practices of both administering analgesics for painful procedures and using non-pharmacological pain management strategies differ from the recommended guidelines. Such significant variations are influenced by nursing characteristics, education, and views. A collective approach among all health care providers is needed if the issue of pain management is to be successfully addressed. Children's pain and pain management policies are multisystem directed by nursing care practices such as nursing assessments and documentation. Inconsistencies in nursing assessments and documentation could confuse caregiver decisions and prolong pain by obstructing access to appropriate medications. (Friedrichsdorf & Goubert, 2020)(Johnson et al.2021)(Tran et al., 2024)(Micheloni et al.2021)(Le et al.2021)

6. Future Directions and Recommendations

Directions for Future Research and Improvement Future research can tailor, compare, and guide best practices, as well as investigate innovative techniques using evidence-based guidelines. It is also important for an experienced and interdisciplinary team to cooperate and put together effective protocols for patient welfare. Special and culturally friendly nursing training programs can be created. Advanced care in pediatric pain management can also be included. As a result of these recommendations, every health care provider can better understand how heavily these children suffer from painful procedures. Awareness of these findings will facilitate the establishment of efficient assessment and management guidelines for pain in these children. It may also lead to family empowerment and guidelines that will encourage them to take a more proactive role in future research.

Nursing Best Practices for Painful Procedures in Children To make any improvements in various fields stated in this review, we recommend some nursing best practices that can be implemented. The limitation of the current evidence on the specific needs of children in connection to culturally sensitive and tailored interventions was identified as a research gap. This gap should be a priority in future research to improve pediatric nursing care for these children. Research should focus on improving nursing practices for pediatric pain. The integration of interdisciplinary protocols, consumer family collaborations, and effective policy changes in care settings, as well as nurses' training in hospitals in pediatrics, surgery, orthopedics, and training nurse families and pediatricians will be taken into account in future research. Involving family members or primary caregivers in care processes and discussions about pain levels and the best pain treatment options for their children may exist in the literature. Nurses and parents use different strategies to control procedural pain in children. Therefore, dealing with parental strategies for children who are undergoing painful procedures is necessary. To guide best practices and enhance pediatric nursing care in children, future trials should investigate this parenting strategy to control pain.

Conclusion

The management of painful procedures in children is a crucial aspect of pediatric nursing, yet it remains a significant challenge in healthcare settings, particularly in Saudi hospitals. This study highlights the widespread occurrence of painful medical procedures among pediatric patients and the role of nurses in minimizing pain through effective assessment, interventions, and family involvement. Despite the availability of pain management tools and strategies, various barriers such as cultural factors, institutional limitations, and emotional responses from both children and parents hinder the optimal delivery of care. Addressing these barriers and improving nursing practices can enhance the quality of pediatric care and ensure better pain management outcomes for children.

Recommendations

1. **Enhance Nurse Training:** There should be an emphasis on continuous education and training for nurses regarding the latest pain assessment tools and pain management techniques, including non-pharmacological interventions such as distraction and relaxation methods.
2. **Standardization of Pain Management Protocols:** Establish and standardize pain management protocols across pediatric healthcare facilities to ensure consistency in practice and improve the effectiveness of interventions.
3. **Cultural Sensitivity:** Develop culturally sensitive training programs for healthcare providers to address the unique cultural and religious factors that may influence pain perception and management in children.
4. **Parental Involvement:** Encourage and support the active involvement of parents in pain management decisions, ensuring they are informed and empowered to assist in reducing their child's pain and anxiety.
5. **Multidisciplinary Collaboration:** Promote interdisciplinary collaboration among pediatricians, nurses, psychologists, and other healthcare professionals to create a comprehensive approach to pain management that addresses both physical and emotional aspects.
6. **Further Research:** Conduct more research into pediatric pain management, particularly focusing on the effectiveness of various pain relief strategies, the impact of repeated painful procedures, and the long-term emotional and psychological effects on children.
7. **Improve Documentation:** Standardize the documentation of pain assessments and interventions to help track the effectiveness of pain management strategies and inform future care decisions.

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