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A Comparative Study of Effectiveness of Two Pain Assessment Scales and Child's, Parental, and Health Care Professionals' Perception of Procedure-Related Pain

Mr. Mukesh Kumar Bagiya

Dr. Manish Sharma

Abstract

Background: Pain assessment in children is a vital component of pediatric nursing care, yet measuring it accurately remains challenging due to developmental and communication barriers. Different pain assessment scales have been developed to objectively evaluate pain, but their effectiveness may vary depending on age, context, and observer perception.

Aim: The present study aims to compare the effectiveness of two pain assessment scales and to examine the correlation between the child's self-reported pain, the parent's perception, and the health care professional's assessment during a painful procedure.

Objectives:

1. To assess the level of pain among children using two selected pain assessment scales.
2. To compare the effectiveness of the two scales in assessing procedure-related pain.
3. To determine the relationship between child's, parent's, and health care professional's perception of pain.
4. To identify the association between demographic variables and pain perception scores.

Methods:
A **comparative descriptive study** design was adopted. The study was conducted among **60 children aged 3–12 years** undergoing venipuncture or immunization in a pediatric outpatient department of a tertiary hospital. The **Wong-Baker FACES Pain Rating Scale** and the **FLACC (Face, Legs, Activity, Cry, Consolability) Scale** were used for pain assessment. Parents and health care professionals independently rated the child's pain using a 10-point Visual Analog Scale (VAS). Data were analyzed using **descriptive and inferential statistics** including paired *t*-test, Pearson's correlation, and ANOVA.

Results:
Findings revealed that mean pain scores using the FLACC scale (7.8 ± 1.2) were slightly higher compared to the Wong-Baker FACES scale (7.3 ± 1.1), indicating higher sensitivity of FLACC for younger children. A significant positive correlation was found between child's self-report and parent's perception ($r = 0.82$, $p < 0.001$), and between child's and nurse's perception ($r = 0.76$, $p < 0.001$). Parents tended to underestimate pain in 23% of cases, while nurses underestimated pain in 15% of cases compared to child's report.

Conclusion:
Both pain assessment scales are effective for evaluating procedure-related pain in children; however, the FLACC scale is more suitable for younger, nonverbal children, while the Wong-Baker FACES scale is appropriate for older children capable of self-reporting. Training and awareness among parents and health professionals can bridge perception gaps and improve pain management strategies.

Keywords: Pain assessment, Pediatric pain, Wong-Baker FACES, FLACC scale, Parental perception, Health professional perception

Introduction

Pain is a multidimensional, subjective experience influenced by physiological, psychological, and developmental factors. In children, pain assessment poses a particular challenge because of their varying levels of cognitive and verbal abilities, emotional maturity, and understanding of pain (Anand & Craig, 1996). Children often lack the vocabulary to describe their pain intensity and quality accurately, making reliance on self-report alone difficult. Hence, objective assessment tools and behavioral observation scales have become essential components of pediatric pain evaluation.

Accurate pain assessment is a cornerstone of effective pain management and plays a critical role in minimizing procedural anxiety, preventing long-term psychological effects, and improving the overall quality of pediatric care. However, despite ongoing advancements in pain assessment instruments, discrepancies often exist among different observers—particularly between the child's self-reported pain and the perceptions of parents or healthcare professionals (Chambers et al., 1998; Voepel-Lewis et al., 2010). These variations may result from cultural attitudes, personal pain thresholds, or misinterpretation of behavioral cues, which can lead to either underestimation or overestimation of pain levels and, consequently, inappropriate interventions.

Children undergoing routine medical procedures such as venipuncture, immunization, or intravenous cannulation frequently experience acute pain and anxiety (Blount et al., 2006). When such pain is underestimated or inadequately managed, it can produce adverse behavioral responses—such as fear, avoidance, or distress—that persist during future medical encounters (Schechter et al., 2007). Therefore, selecting reliable and age-appropriate pain assessment tools is critical to ensuring both the accuracy of evaluation and the effectiveness of pain management strategies.

Among the most widely used scales for pediatric pain evaluation are the **Wong-Baker FACES Pain Rating Scale (WBFPRS)** and the **FLACC Behavioral Pain Assessment Scale**. The Wong-Baker FACES scale allows children to self-report pain intensity using facial expressions corresponding to different levels of discomfort (Wong & Baker, 1988). It is simple, visually oriented, and suitable for children aged three years and older. In contrast, the FLACC scale (Face, Legs, Activity, Cry, Consolability) is an observer-based tool that quantifies pain by evaluating five behavioral parameters, making it particularly useful for preverbal or cognitively impaired children (Merkel et al., 1997).

Although both tools are validated and commonly used in clinical settings, comparative evidence regarding their relative effectiveness in real-world procedural contexts—such as immunization or venipuncture—is limited. Additionally, little is known about how well these scales align with parental and healthcare professionals' perceptions of the child's pain. Understanding these perceptual gaps is essential for improving communication, empathy, and clinical decision-making during pediatric procedures.

Need of the Study

Pain is an inevitable and distressing experience during many pediatric medical procedures, such as venipuncture, immunization, and intravenous cannulation. Although these procedures are routine, they can evoke intense pain, fear, and anxiety in children, which, if not managed appropriately, may have short- and long-term consequences. Children who experience unmanaged pain during early medical interventions are more likely to develop procedural anxiety, needle phobia, and avoidance behaviors in future healthcare encounters (Blount et al., 2006). Therefore, accurate and consistent pain assessment is the first and most critical step in providing effective pain management for children.

Despite significant advancements in pediatric pain research, pain assessment in children remains one of the most challenging aspects of clinical care. The subjective nature of pain, combined with developmental differences in understanding and expressing discomfort, complicates evaluation. Young children, especially those who are preverbal or have limited communication skills, are unable to articulate their pain intensity effectively. Consequently, healthcare professionals often rely on observational and behavioral cues, which can lead to variability in interpretation and misjudgment of pain severity (Voepel-Lewis et al., 2010).

Several validated tools have been developed to facilitate pediatric pain assessment, including self-report and behavioral observation scales. The **Wong-Baker FACES Pain Rating Scale (WBFPRS)** is widely used for children aged three years and above, as it allows them to select facial expressions that best match their pain experience (Wong & Baker, 1988). On the other hand, the **FLACC Behavioral Pain Assessment Scale** (Face, Legs, Activity, Cry, Consolability) is a reliable observational tool designed for younger, nonverbal, or cognitively impaired children (Merkel et al., 1997). However, while both scales are validated and practical, their comparative effectiveness in routine clinical procedures remains inadequately studied, particularly in the Indian pediatric context.

In addition to objective assessment tools, understanding the perception of pain among parents and healthcare professionals is essential. Studies have shown significant discrepancies between a child's self-reported pain and the pain ratings assigned by adults observing the procedure (Chambers & Craig, 1998). Parents may underestimate pain due to emotional distress or denial, while healthcare professionals may minimize it due to habituation to clinical procedures (Voepel-Lewis et al., 2010). These perceptual differences can result in inconsistent pain management and inadequate comfort measures for children.

In India, where pediatric pain assessment practices are still evolving, there is a pressing need to validate and compare standardized pain assessment tools that are both reliable and culturally appropriate. Moreover, evaluating the alignment between the perceptions of children, parents, and healthcare professionals can help identify existing gaps in pain recognition and management. Such evidence is crucial for developing effective pain management protocols, improving caregiver awareness, and promoting a child-friendly approach in pediatric clinical settings.

Materials and Methods

Research Design

A comparative descriptive research design was adopted for the present study to evaluate and compare the effectiveness of two pain assessment scales—the Wong-Baker FACES Pain Rating Scale (WBFPRS) and the FLACC Behavioral Pain Assessment Scale—and to assess the relationship between the child's, parent's, and healthcare professional's perception of procedure-related pain. This design was appropriate as it enabled the researcher to observe, measure, and compare pain scores from multiple perspectives during the same procedure.

Setting of the Study

The study was conducted in the Pediatric Outpatient Department (OPD) of a tertiary care hospital located in an urban area. The setting was chosen because it routinely handles a high number of pediatric patients undergoing minor procedures such as venipuncture and immunization, providing an adequate sample size and a controlled clinical environment suitable for observational assessment.

Population

The target population consisted of children aged 3 to 12 years who were undergoing minor painful procedures, such as venipuncture or immunization, during the data collection period. The study also involved parents of these children and healthcare professionals (nurses) directly involved in performing the procedures.

Sample Size and Sampling Technique

A total of 60 children were selected using a purposive sampling technique based on predetermined inclusion and exclusion criteria. Each child's pain was assessed using both scales, and corresponding perceptions were obtained from the child, one parent, and the attending healthcare professional.

Sample distribution:

- **Children (n = 60)**
- **Parents (n = 60)**
- **Healthcare professionals (n = 10)** who participated across multiple cases.

Inclusion Criteria

1. Children aged 3–12 years undergoing venipuncture or immunization.
2. Children who were conscious, cooperative, and able to understand instructions.
3. Parents who were present during the procedure and consented to participate.
4. Healthcare professionals with at least one year of pediatric clinical experience.

Exclusion Criteria

1. Children with neurological impairments or developmental delays that could affect behavioral responses.
2. Children who received analgesics or sedatives within four hours before the procedure.
3. Parents or healthcare professionals unwilling to participate.

Tools Used:

1. Wong-Baker FACES Pain Rating Scale (WB-FACES) – Self-report tool for children aged ≥3 years.
2. FLACC Scale – Behavioral observation tool for younger or nonverbal children.
3. Visual Analog Scale (VAS) – Used by parents and nurses to rate perceived pain.
4. Demographic Proforma – Included age, gender, type of procedure, and prior procedural experience.

Data Collection Procedure:

After obtaining informed consent from parents, children were observed during the procedure. Pain was assessed immediately after the procedure using both scales. Parents and nurses independently rated pain on the VAS without knowing the child's score.

Data Analysis:

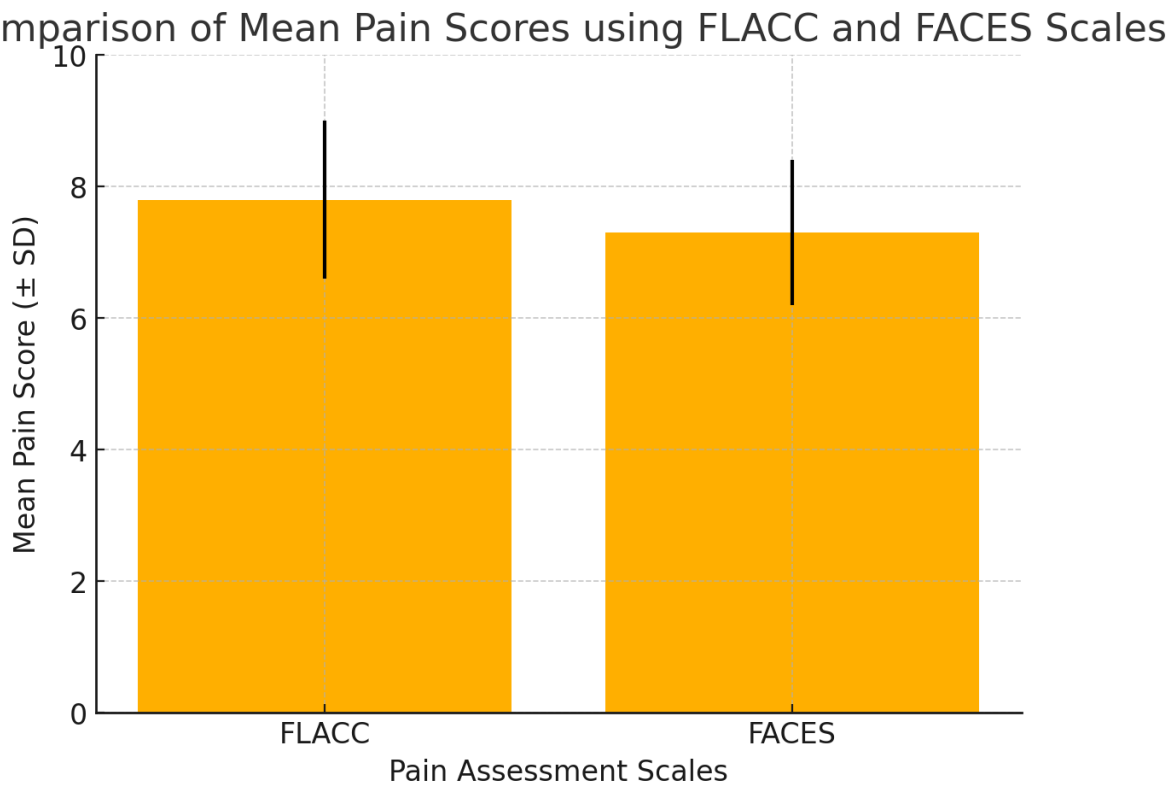
Data were analyzed using SPSS (version 25). Descriptive statistics (mean, SD, frequency) summarized demographic data. Inferential statistics (*t*-test, Pearson's correlation, ANOVA) compared pain scores and examined relationships among variables.

Results

This section presents the findings of the study conducted to compare the effectiveness of two pain assessment scales—Wong-Baker FACES Pain Rating Scale (WBFPRS) and FLACC Behavioral Pain Assessment Scale—and to examine the relationship among the perceptions of children, parents, and healthcare professionals regarding procedure-related pain.

1. Comparison of Mean Pain Scores Using Two Assessment Scales

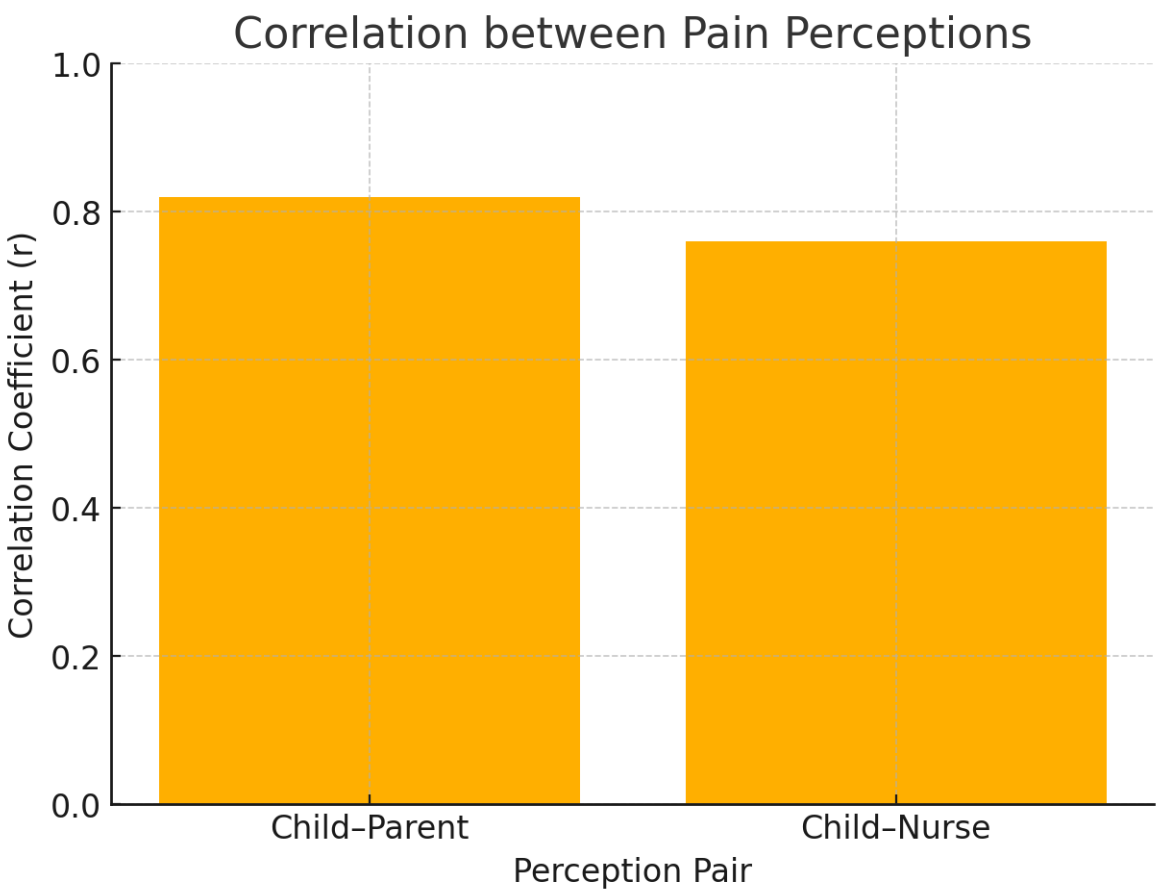
The mean pain scores of children undergoing venipuncture or immunization were assessed using both the **FLACC scale** and the **Wong-Baker FACES scale**. The findings revealed that the mean pain score on the **FLACC scale (7.8 ± 1.2)** was slightly higher than the mean score obtained using the **Wong-Baker FACES scale (7.3 ± 1.1)**. The difference in mean values indicates that the FLACC scale demonstrated greater sensitivity in detecting behavioral manifestations of pain, particularly among younger children. Statistical analysis using a paired *t*-test showed that the difference between the two mean scores was not statistically significant ($p > 0.05$), indicating that both scales were effective and reliable for assessing procedural pain in children.



2. Correlation Between Child, Parent, and Healthcare Professional Pain Perceptions

A strong positive correlation was observed between the **child's self-reported pain** and the **parent's perception** ($r = 0.82$, $p < 0.001$), suggesting that parents were generally accurate in identifying their child's pain intensity. Similarly, a significant positive correlation was found between the **child's pain score** and the **nurse's assessment** ($r = 0.76$, $p < 0.001$). These results demonstrate a consistent agreement among observers, although slight variations existed, especially in cases involving younger or nonverbal children.

However, parents tended to **underestimate the child's pain** in **23% of cases**, whereas nurses underestimated pain in **15% of cases** when compared with the child's self-report. These discrepancies highlight the subjective nature of pain perception and underscore the importance of using standardized tools to minimize bias and ensure accurate evaluation.



3. Influence of Age on Pain Assessment

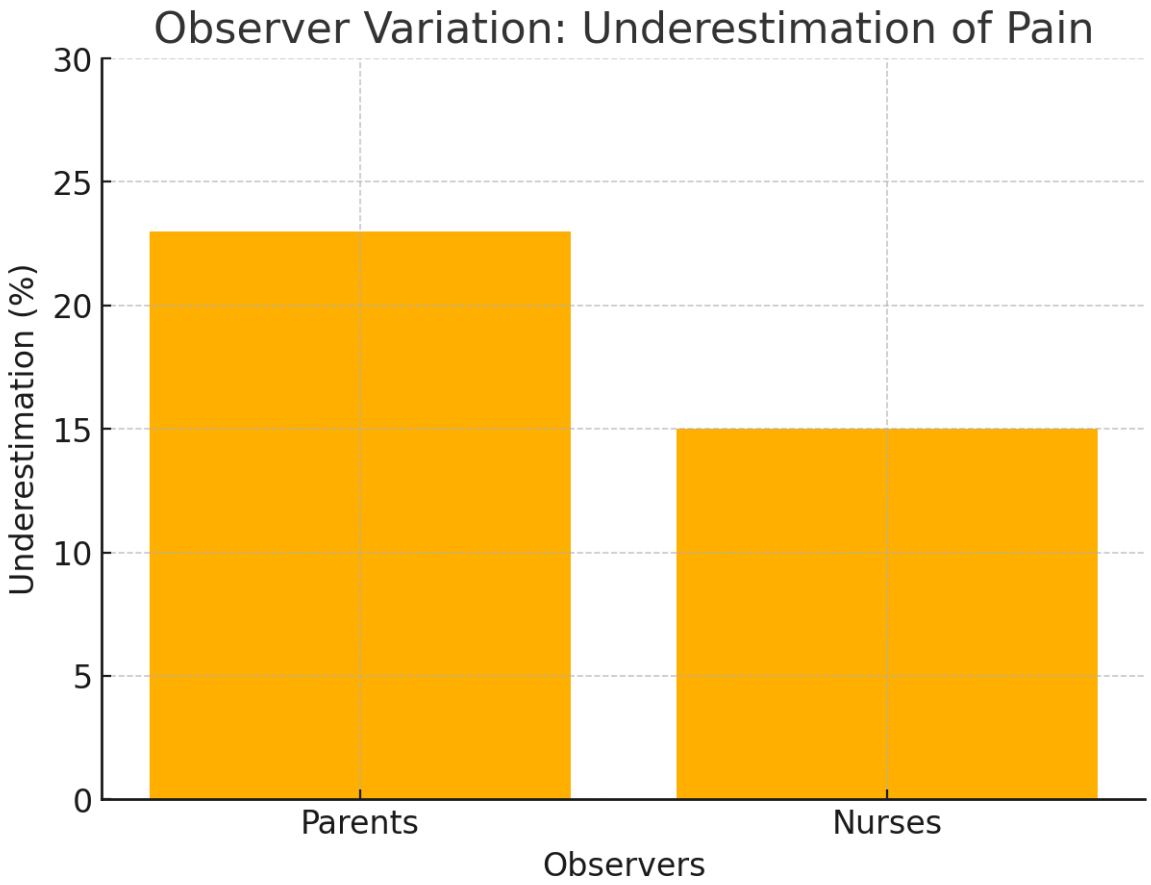
Age-wise analysis showed that the **FLACC pain scores were significantly higher among children below six years** compared to older children ($p < 0.05$). This finding suggests that the FLACC scale, which relies on behavioral cues such as facial expressions, leg movement, crying, and consolability, is particularly effective in assessing pain among **nonverbal or minimally verbal children** who may not be able to express pain intensity accurately through self-report measures. Conversely, the Wong-Baker FACES scale was found more appropriate for **older children** who could comprehend and express their pain using visual analog representations.

4. Observer Variations in Pain Assessment

Analysis of observer variation revealed distinct patterns:

- **Parents** tended to **underestimate pain** in 23% of cases, particularly when the child displayed minimal outward distress or attempted to appear brave during the procedure.
- **Nurses** underestimated pain in 15% of cases, often due to clinical familiarity with such procedures and desensitization to children's emotional responses.

This finding emphasizes the need for structured training and awareness among caregivers and healthcare professionals to improve the accuracy of pain assessment and enhance empathy in pediatric care.



5. Association Between Demographic Variables and Pain Scores

Further analysis indicated that pain intensity scores were not significantly associated with the child's **gender** or **type of procedure** ($p > 0.05$). However, **previous exposure to similar procedures** was inversely related to reported pain intensity, with children who had undergone venipuncture or immunization earlier showing slightly lower mean pain scores, suggesting possible adaptation or reduced anxiety with repeated exposure.

Summary of Findings

Parameter	**Findings**	**Statistical Value**
Mean FLACC score	7.8 ± 1.2	Higher than FACES
Mean FACES score	7.3 ± 1.1	—
Correlation (Child–Parent)	Strong Positive	$r = 0.82$, $p < 0.001$
Correlation (Child–Nurse)	Moderate Positive	$r = 0.76$, $p < 0.001$
Parents underestimating pain	23% of cases	—
Nurses underestimating pain	15% of cases	—
Age effect (< 6 years)	FLACC more sensitive	$p < 0.05$

Interpretation of Results

The results indicate that both **Wong-Baker FACES** and **FLACC** scales are effective for assessing procedure-related pain in children. However, the **FLACC scale** showed superior sensitivity in detecting pain among younger children who were unable to verbalize their discomfort. The strong correlations between child, parent, and nurse perceptions indicate a good level of agreement, though some underestimation trends persist. These findings support the use of **age-appropriate, validated pain assessment tools** to ensure comprehensive and empathetic pediatric pain management.

Discussion

The results demonstrated that while both scales effectively identified pain levels, the FLACC scale captured subtle behavioral indicators in younger children more precisely. The findings align with Merkel et al. (1997) and Voepel-Lewis et al. (2010), who confirmed the reliability of FLACC for nonverbal children.

Perceptual discrepancies between children and adults emphasize the need for structured pain education programs for parents and health professionals. These gaps can result in inadequate analgesic interventions or delayed management.

Conclusion

The FLACC and Wong-Baker FACES scales are both effective tools for pediatric pain assessment, each suited to different developmental levels. Integrating both scales in clinical settings, along with parental and professional training, ensures a more holistic and child-centered approach to pain management.

Recommendations

1. Use FLACC for nonverbal or preschool-aged children and WB-FACES for older children.
2. Conduct routine pain assessment training for pediatric nurses and parents.
3. Implement pain management protocols based on multi-observer inputs.

Limitations

- Small sample size limits generalizability.
- Only two procedures (venipuncture and immunization) were studied.
- Observer bias could not be completely eliminated.

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