

# FLACC Behavioral Pain Assessment Scale: A Comparison with the Child's Self-Report

Martha H. W. Willis  
Sandra I. Merkel  
Terri Voepel-Lewis  
Shobha Malviya

The purpose of this study was to further test the validity of the Faces, Legs, Activity, Cry and Consolability (FLACC) Behavioral Pain Assessment Scale for use with children. Thirty children aged 3-7 years ( $5.01 \pm 1.44$ ) who had undergone a variety of surgical procedures were observed and assessed for pain intensity at 20 + 2 hours after surgery. FLACC scores were assigned by one of the nurse investigators, and a self-report of pain using the FACES scale was obtained from the child. There were significant and positive correlations between the FLACC and FACES scores for the entire sample and for the scores of children 5-7 years of age, but not for children < age 5. These findings provide additional support for the construct validity of the FLACC Pain Assessment Tool.

Martha H. W. Willis, MS, RN, CPNP, is Pediatric Nurse Practitioner, Cincinnati Children's Hospital Medical Center, Cincinnati, OH.

Sandra I. Merkel, MS, RN, is Clinical Nurse Specialist, C.S. Mott Children's Hospital, University of Michigan Health Systems, Ann Arbor, MI.

Terri Voepel-Lewis, MS, RN, is Clinical Nurse Specialist, C.S. Mott Children's Hospital, University of Michigan Health Systems, Ann Arbor, MI.

Shobha Malviya, MD, is Associate Professor of Anesthesiology, C.S. Mott Children's Hospital, University of Michigan Health Systems, Ann Arbor, MI.

The difficulty quantifying and qualifying pain in young children may place this population at risk for inadequate pain control (Colwell, Clark, & Perkins, 1996). While self-report of pain should be obtained whenever possible, behavioral observation remains the primary method for pain assessment in children with limited verbal and cognitive skills. The Faces, Legs, Activity, Cry and Consolability (FLACC) Behavioral Pain Assessment Tool (see Table 1) was developed to provide a simple and consistent method for nurses to identify, document, and evaluate pain in children who have difficulty verbalizing the presence or intensity of pain (Merkel, Voepel-Lewis, Shayevitz, & Malviya, 1997). This study was designed to further validate the FLACC tool by comparing nurse assigned FLACC scores to the child's self-report of pain.

## Review of the Literature

Self-report of pain remains the recommended method to assess pain intensity in both adults and children. However, young children often do not have the cognitive or verbal skills necessary to report and describe pain. Reliable use of a tool or scale that estimates or quantifies pain requires the cognitive ability to classify and communicate pain intensity. According to Piaget and Inhelder (1969), preoperational children do not have the cognitive ability to quantify and tend to choose extremes when presented with multiple response options. This theory was supported in a study of children aged 4-5 years undergoing immunization, where the majority of children rated their pain as 0, 1, or 5 on the 0-5 FACES scale (Stein, 1995). Yet, recent reports on developmental concepts and pain assessment suggest that the precise knowledge of numbers on a pain scale is not necessary

in order to rank pain and that children older than 3 years of age can use pictures to self-report their pain (Keck, Gerkenmeyer, Joyce, & Schade, 1996). Furthermore, a large pain study in children birth to 17 years of age reported that if a child is willing and able to express pain using a self-report scale, his/her report can be trusted on the condition that the child has understood the use of the scale (Maunuksela, Olkkola, & Korpela, 1987). Several tools that incorporate symbols or pictures have been developed and validated to help children quantify their pain intensity. These include the Oucher (Beyer, Denyes, & Villarruel, 1992), Poker Chips (Hester, 1979), and Wong-Baker FACES scale (Wong & Baker, 1988). The FACES scale has been shown to be the preferred pain tool of children of various ages (Keck et al., 1996).

When children cannot speak or comprehend and use self-report pain measurement tools, behavior is the primary means by which they communicate their pain. Specific distress behaviors such as crying, facial grimaces, body posture, rigidity, changes in sleep, and consolability have been associated with pain in young children. Investigators and clinicians have incorporated these behaviors into behavioral pain scales to help with the objective measurement of pain when self-report is difficult (Buttner & Finke, 2000; McGrath et al., 1985; Norden et al., 1991; Soetenga, 1999; Tarbell, Cohen, & Marsh, 1992). The Children's Hospital of Eastern Ontario Pain Scale (CHEOPS) was one of the earliest developed tools to systematically assess and document pain behaviors in young children and, as such, remains a gold standard for comparative purposes (McGrath et al., 1985). This tool incorporates six categories of behavior that are each scored individually (range of 0-2 or 1-



Table 1. FLACC Behavioral Scale

Categories	Scoring*		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractible	Difficult to console or comfort

**Note:** \*Each of the five categories Face (F), Legs (L), Activity (A), Cry (C), and Consolability (C) is scored from 0-2, which results in a total score between 0 and 10.

**Note:** From Merkel, Voepel-Lewis, Shayevitz, & Malviya (1997). The FLACC: A behavioral scale for scoring postoperative pain in young children. *Pediatric Nursing*, 23(3), 293-297.

Table 2. Demographics of the Sample (n = 30)

Gender (M/F)	16/14
Age (mean years + SD)	5.01 ± 1.04
Children > 5 yrs	16
Surgical Procedures	
Otorhinolaryngology	12
Orthopedic	9
Genitourinary	2
Thoracic	2
Other	5

3) and then totaled for a pain score ranging from 4-13. Its length and variable scoring system among categories make the CHEOPS somewhat complicated and impractical to use relative to other observational scales. The Children's and Infants' Postoperative Pain Scale (CHIPPS) was recently developed to include five behavioral items that were found to be consistently indicative of pain in both infants and young children in a series of studies (Büttner & Finke, 2000). These five items included crying, facial expression, posture of trunk, posture of legs, and motor restlessness. Büttner and Finke (2000) compared and summarized seven studies of

behavioral observational tools and demonstrated the validity of several observational methods of pain assessment in detecting postoperative analgesic demand in infants and young children, but described the CHIPPS scale as being the easiest to use, learn, and implement.

While no single behavioral scale has been shown to be superior to others, some are difficult to integrate into routine clinical practice because of the length of time required for their administration and their complexity of scoring. The FLACC scale was developed to reduce these potential barriers by providing a simple framework for assessment, while facilitating a reliable and objective means of quantifying pain behaviors in children. This tool includes five categories of pain behaviors, including facial expression, leg movement, activity, cry, and consolability. These behaviors are consistent with those described by Büttner and Finke (2000) to be reliably associated with pain in young children. The acronym FLACC facilitates recall of these categories, each of which is scored from 0-2 to provide a total pain score ranging from 0-10. The FLACC tool was shown to have good interrater reliability and excellent validity as demonstrated by changes in pain scores from before to after analgesic administration and excellent correlation with the Objective Pain Scale (OPS) in a study of children aged 2-7 years (Merkel et al., 1997).

## Methodology

This descriptive, observational study was approved by the University of Michigan Institutional Review Board and was conducted on the inpatient units of the children's hospital. Written informed consent was obtained from the parent/guardian, and children were asked their willingness to use the FACES pain scale prior to their inclusion in the study. Postoperative patients aged 3-7 years comprised the sample. Children with neurologic impairment, those who could not speak English, those who were intubated, or those who had epidural analgesia were excluded from the study.

Each child was observed and assessed for pain once in the presence of a parent between the hours of 7:00 a.m. and 7:00 p.m. and at least 18 hours after surgery to assure that there were no residual effects of general anesthesia and that the child could self-report his/her pain. All observations were made by the same nurse researcher who was experienced with pain assessment in children and familiar with the use of the FLACC tool. In order to reduce potential bias, the observer did not discuss the child's pain with either the parent/guardian nor the child prior to or during the observation. Children were observed for 2-4 minutes and were then assigned a FLACC pain score. Immediately following FLACC scoring, the nurse researcher, using a



standard script, reminded the child how to use the FACES scale and asked the child to point to the face showing how much the child was hurting. In a small sample of these children (17%), a second observer (co-investigator) simultaneously, but independently, observed and assigned FLACC scores to establish interrater reliability.

Spearman's rho correlations were used to compare the FLACC scores to the FACES scores. Agreement between the observers' FLACC scores was determined using Kappa statistics. P values of  $< 0.05$  were accepted as statistically significant.

## Results

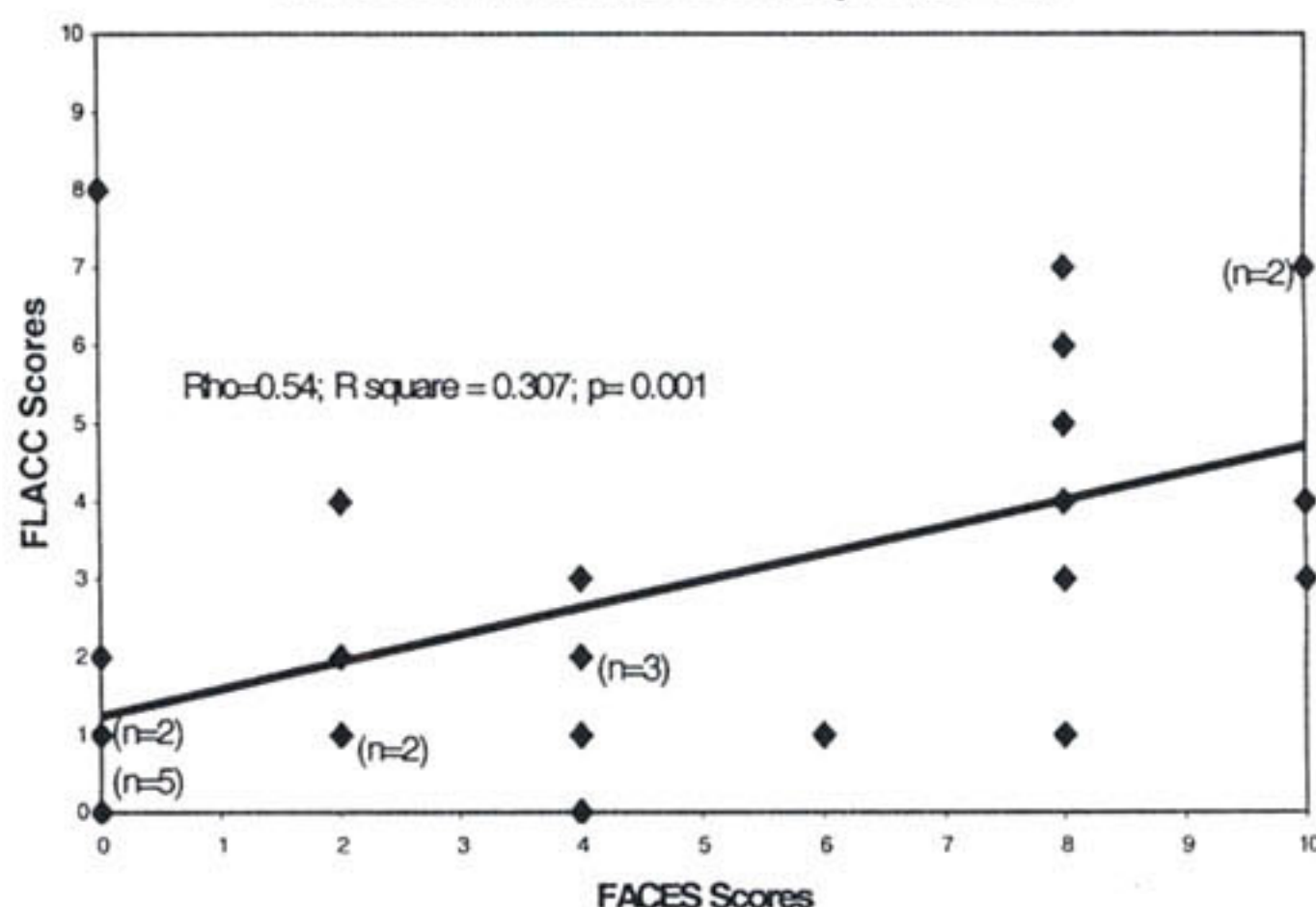
Thirty children aged 3-7 years who underwent a variety of surgical procedures comprised the sample. Demographics are presented in Table 2. The mean time for observations and assessments was  $20 \pm 2$  hours postoperatively (range 18-24). Interrater agreement was established at 100% for the scores obtained in the subset of six children. There was a significant and positive correlation between FACES and FLACC scores for the entire sample of children ( $r[30] = 0.584$ ;  $p = 0.001$ ) (see Figure 1). Data were analyzed separately for children  $< 5$  and for those  $> 5$  years of age. FLACC and FACES scores did not correlate in the younger age group ( $r[14] = 0.254$ ;  $p = .381$ ), however, there was a significant and positive correlation for scores in the older age group ( $r[16] = 0.830$ ;  $p = 0.0001$ ) (see Figures 2 and 3).

## Discussion

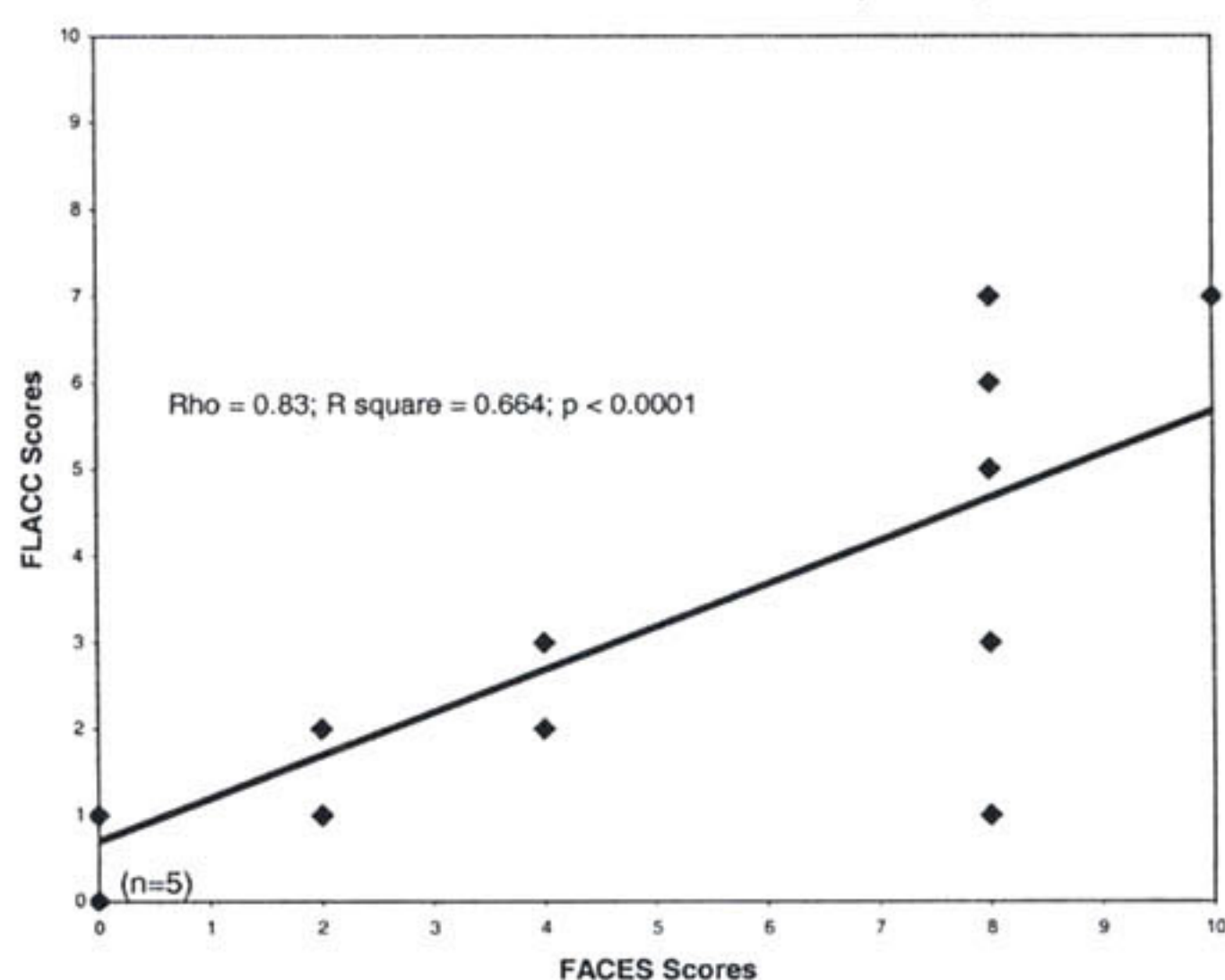
Several observational behavioral tools are available for nurses to use when assessing pain in infants and young children. Selection of an appropriate tool requires consideration of its reliability and validity, as well as its suitability for and utility in the clinical setting. The FLACC observational pain scale was designed as a simple yet reliable tool to assess pain in young children and may be an appropriate choice for pain assessment in many pediatric settings. Findings from this study support the validity of the FLACC pain assessment tool in postoperative children as demonstrated by significant and positive correlations between FLACC and FACES scores in this sample.

Previous studies have reported disparities between observed pain behaviors and self-report of pain (Beyer, McGrath, & Berde, 1990; Stein, 1995). However, in the study by Beyer and colleagues (1990), the lack of correlation between self-reported and observational pain scores may have resulted, in part, from the generally low pain scores among all tools studied. Furthermore, Stein (1995) suggested that children in the study may have been developmentally incapable of choosing and differentiating among the six levels of pain intensity in the FACES scale, raising questions about the validity of self-report in some preschool children. Indeed, a recent study demonstrated that only 26% of 5-year-old children in their study demonstrated the cognitive skills necessary to self-report pain (Fanurik, Koh, Harrison, Conrad, & Tomerlin, 1998). Our data demonstrated good overall correlations between FLACC and FACES scores in the entire sample, with better correlations in the sample of 5-7-year-olds and no relationship between scores in the younger children. Although all children received the same information about using the FACES scale, none were tested for their comprehension of the tool nor their ability to ordinaly rank. These findings, therefore, may reflect a lack of understanding of self-report of pain in some young children. On the other hand, behavioral observation as assessed with the FLACC may not have been a valid indicator of pain in these children.

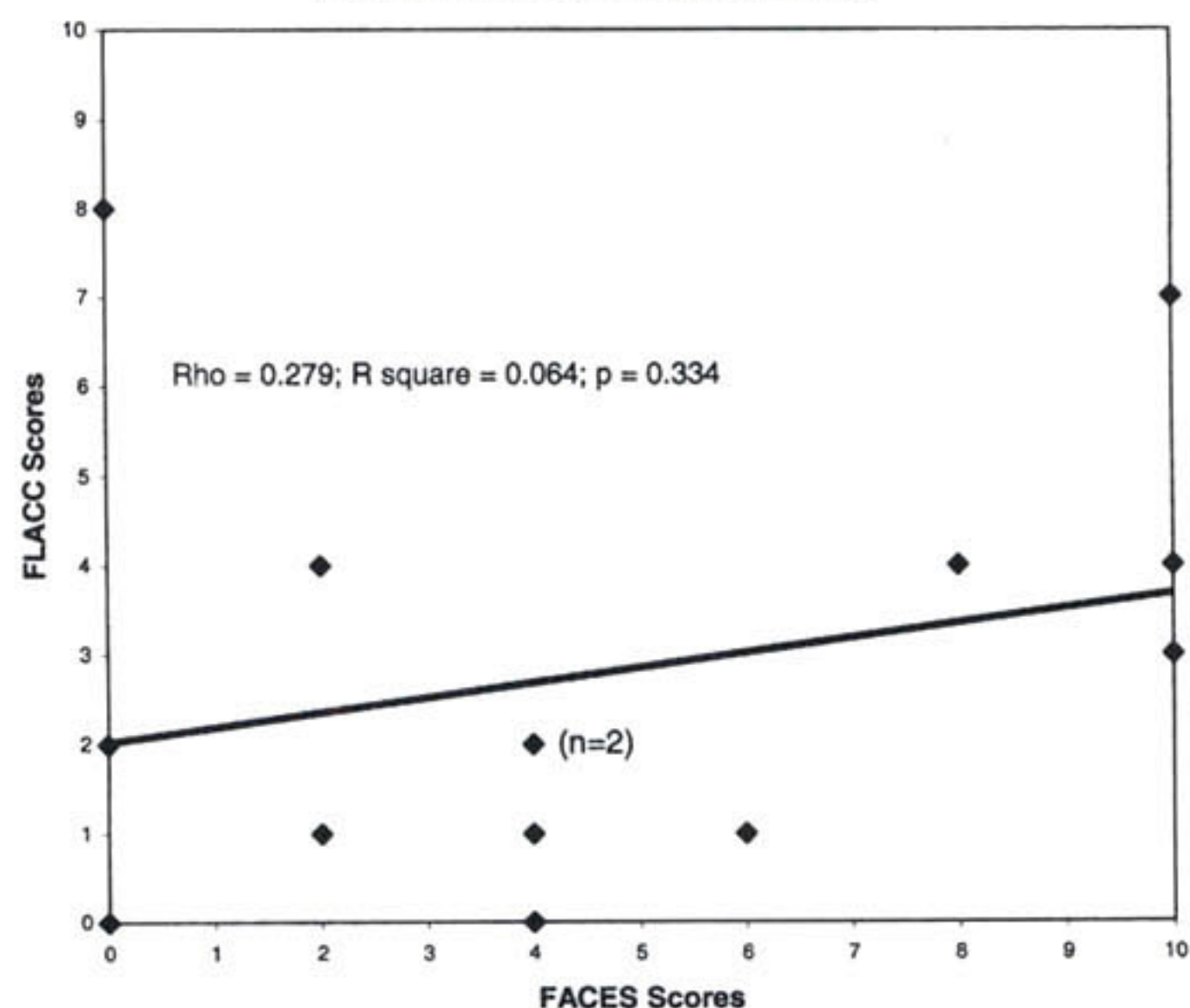
**Figure 1. Relationship Between FLACC and FACES Scores in the Entire Sample (n=30)**



**Figure 2. Relationship Between FLACC and FACES Scores in Children 5-7 Years (n=16)**



**Figure 3. Relationship Between FLACC and FACES Scores in Children < 5 Years (n=14)**





Pain assessment in young children remains a challenge since self-report and observational methods each have inherent weaknesses in this population. In non-verbal children and those with limited cognitive abilities, however, behavioral cues are generally the only means by which the presence and intensity of pain can be evaluated. Observational pain scales can facilitate the quantification and evaluation of pain behaviors for clinical decision making in these populations. Their use to guide practice, however, requires careful consideration of the context of the child's behavior. Distress behaviors may be unrelated

to pain in some children or, on the other hand, may be masked in others who have pain. Although the incorporation of pain assessment tools adds an objective, science-based component to clinical practice, caring for the child in pain necessitates an artful approach as well.


The incorporation of pain scales into routine pain assessment and documentation can be a difficult process. Hester and associates (1998) have described several attributes that contribute to the successful integration of a pain assessment tool into daily practice. These include: the tool's relative advantage over other tools, its compatibility with current practice, its complexity (or simplicity), trialability, and observability. To be clinically useful, pain assessment tools need to be short, simple, easy to memorize, and should also be generalizable to a variety of settings. The FLACC may have an advantage over other behavior tools for integration into routine care because of its simplicity and relative ease of use. Further study in a variety of settings involving diverse cultures and races would provide data for further validation and generalization of this scale.

In summary, findings from this study lend support to the overall construct validity of the FLACC as a measure of postoperative pain in children. Disparities in FACES and FLACC scores in the small sample of 3-4-year-olds, however, highlight the ongoing difficulties in pain assessment in this population. The incorporation of the FLACC behavioral observational tool as a component of pain assessment into routine clinical practice may help to facilitate clinical decisions regarding management of pain in children.

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