

# Educational Video to Improve the Knowledge of Health Care Providers in Pain Assessment of Preschool Children

Sahatsa Mandee, M.D., Suwannee Suraseranivongse, M.D., Tanawadee Teerachanant, M.D., Aucharee Pradubsuk, RN., Korntip Hanpongwiwat, RN.

Department of Anesthesia, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

## ABSTRACT

**Objective:** To evaluate the effect of pain assessment with preschool children educational video to assist healthcare providers' ability to assess pain using CHEOPS and FLACC scores.

**Methods:** A randomized controlled study was conducted in healthcare providers having less than one year experience in pediatric pain management. Participants were randomized into study group and control. Participant's demographic data, existing experience and knowledge in pain assessment, pre-test and post-test's corrected scores and time required were recorded.

**Results:** One hundred healthcare providers were recruited. There were no differences between groups in pre-test score, the percentage of correct scoring in treatment decision and time required for assessment using CHEOPS and FLACC scores. Improvements in post-test scores were found in both groups with no statistical significance. However, the difference in time needed to compare the pre-post test results was lower in the control group. Twenty nine participants in the study group evaluated the educational video. They stated it to be informative, easy to understand and conveyed confidence about preschool pediatric pain assessment.

**Conclusion:** A pain assessment education video is one of the media that can possibly be used for assisting pain assessment education. It could improve confidence and understanding in healthcare providers treating pain in preschool children.

**Keywords:** Pediatric pain assessment, educational video

Siriraj Med J 2012;64: 22-26

E-journal: <http://www.sirirajmedj.com>

## INTRODUCTION

Pain is underestimated and inadequately treated in pediatric patients.<sup>1-4</sup> In preschool children pain assessment is difficult, as they have verbal and cognitive limitations to express their feeling and doing self reports.<sup>5-6</sup> On the other hand sufficient pain assessment is an essential precondition to provide effective pain management.

Lack of knowledge in pain management is the primary cause for insufficient treatment. Broome et al.,<sup>6</sup> have reported that only 20% of health professionals use behavioral measures for assessment of pain in children, suggesting skill deficits and lack of resources may be responsible.

There are encouraging studies about the positive effect of educational videos for increasing patients and parental knowledge in pediatric pain management, reducing anxiety about treatment and increasing understanding about the procedures<sup>8-10</sup>. The educational video may be one of the easy available resources for knowledge transfer and self-study.

In this study, we evaluated the effect of a pain assessment for preschool children educational video on healthcare providers' knowledge in assessing pain scores using the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS) and FLACC scale (Face, Leg, Activity, Crying, Consolability) and the quality of their treatment decision and the time needed for it.

## MATERIALS AND METHODS

### Materials

1. Pre-test- and post-test-clip-video, containing 10 clips of pediatric patients during the post-operative period in the recovery room.
2. Pre-school pain assessment educational video,

Correspondence to: Sahatsa Mandee

E-mail: [sahatsa2@hotmail.com](mailto:sahatsa2@hotmail.com)

Received 28 July 2011

Revised 12 September 2011

Accepted 12 September 2011

teaching about pediatric pain behavior and pediatric pain assessment tool: physiological measure, behavioral measure and self report. Finally there are clips about pain behavior to practice scoring with CHEOPS and FLACC.

### 3. Scoring sheet in Thai version (Appendix 2).

#### Method

After approval from our institutional ethical board committee a prospective, controlled, randomized study was performed in 100 healthcare providers (50 physicians and 50 nurses) experienced in pediatric pain management <1 year. Demographic data, previous education in pain assessment, experience in pain management and confidence in pain assessment were recorded.

Participants were randomized into 2 groups, with 50 participants each (Appendix 1). All participants (n = 100) did the pretest rating CHEOPS and FLACC scores and deciding pain control strategies. In addition the participants saw 10 clips of pediatric pain behavior and had to make their assessment (scoring sheet, Appendix 2); the time needed was recorded. After that the study continued in two groups (“study” and “control”).

The study group watched a 25 minute educational preschool children pain assessment video, written by the authors, containing information and examples for pediatric pain assessment using CHEOPS and FLACC. They were then asked to do the ratings using CHEOPS and FLACC scores and make a decision for therapeutic options. The same procedure as before was performed, watching 10 clips about pediatric pain behavior and making therapeutic decisions and again the time needed was recorded.

During the time the study group attended the educational video the control group could have a rest and then performed the post-test. The test results of the two groups were compared as well as the time needed for answering all questions.

The study group participants were asked to evaluate the educational video using Likert scale 1 to 5 (1 = strongly disagree, 5 = strongly agree) regarding the practicability, the confidence gained after viewing and its usefulness (Appendix 3).

The answers (pre-test and post-test) were validated by 3 pediatric pain lecturers, who themselves watched the video, assessed the CHEOPS and FLACC scores and made the treatment decisions for each pediatric pain behavioral.

Our study was approved by the Siriraj Institutional Review Board of the Faculty of Medicine Siriraj Hospital, Mahidol University (EC No.297/2552).

#### Statistics

Sample size was calculated on the basis of a pilot study using SAM. In 10 cases we found viewing the video lead to a 30% improvement of post test score. The estimated sample size was 49 per group.

Demographic data were presented as mean (SD) and analyzed using descriptive statistics. Continuous variables were analyzed by Student unpaired t-test for normally distributed and by Mann Whitney U test FOR not normally distributed variables. P <0.05 was considered statistically significant. All analyses were performed with SPSS for Windows V.11.5.

## RESULTS

There were no differences in demographic data between the 2 groups except age (study  $25.3 \pm 2.7$  vs.

**TABLE 1.** Demographic data, representation of participants.

	Study (n=50)	Control (n=50)	p
Gender (Female/Male)	42/8	39/11	0.444
Age (yr)	25.3 (2.7)	26.8 (3.8)	0.025
Department			
Anesthesiology	19	32	
Pediatric Surgery	1	1	
Pediatric	18	0	0.373
Orthopedic	3	2	
Other	9	15	
Previous lecture (N/Y)	34/16	27/23	0.151
Previous experience (N/Y)	34/16	41/19	0.106
Previous confidence			
Poor	22	32	
Fair	28	16	0.140
Good	0	2	

control  $26.8 \pm 3.8$ ,  $p = 0.025$ ).

From the 100 participants 39% already had experienced previous conventional lectures about pain management, without differences between the groups. The majority of participants (54%) rated their confidence in the topic as poor; only 2% were confident in the matter (Table 1).

The initial scores in both groups were without differences (Table 2) with the control group needing a little more time for the pre-test but without statistical significance.

Improvements in post-viewing (after 30 minutes rest) scores were found in both groups in terms of correct answers (CHEOPS and FLACC) and also treatment decisions. However, the difference in time needed comparing pre-post test was lower in the control group ( $p = 0.04$ ; Table 3).

In the study group 29 participants stated that the video was informative and easily to understand and they gained more confidence about preschool pediatric pain assessment.

Twenty two participants stated that they had good confidence after viewing the video. (Table 4)

## DISCUSSION

Pain is under-recognized and undertreated in pediatric patients. Pain assessment is one of the key elements for adequate pain management, especially in these patients. In hospitalized children, previous studies had shown insufficient pain assessment and inadequate pain control, even in a well-resourced tertiary referral pediatric center.<sup>2,4,6</sup> Pain assessment is the key for improving the quality of care and its documentation helps to make pain “visible”.

**TABLE 2.** Pre-test score.

Pre-test	Study (n=50)	Control (n=50)	p
Percentage of correct scoring in CHEOPS	71.8	72.4	0.830
Percentage of correct scoring in FLACC	67.4	66.6	0.765
Percentage of correct decision to treat using CHEOPS tool	91	91	0.988
Percentage of correct decision to treat using FLACC tool	89.6	89.2	0.830
Pre-test time (sec.)	594.8	622.7	0.398

**TABLE 3.** Difference from pre-test comparing with post-test.

Difference	Study (n=50)	Control (n=50)	p
Percentage of correct scoring in CHEOPS	48.4	52.6	0.473
Percentage of correct scoring in FLACC	50.7	49.3	0.801
Percentage of correct decision to treat using CHEOPS tool	47.4	53.6	0.282
Percentage of correct decision to treat using FLACC tool	52.4	47.6	0.389
Time (sec.)	103.8	155.5	0.004

Broome et al.,<sup>6</sup> reported 83% of health professionals admitting knowledge deficits in pediatric pain assessment, and 30% of them identified lack of resources to be responsible. In our study, we even found 98% of healthcare workers with less than one year experience had no confidence in pediatric pain assessment. Only 39% of them had received particular education in that issue.

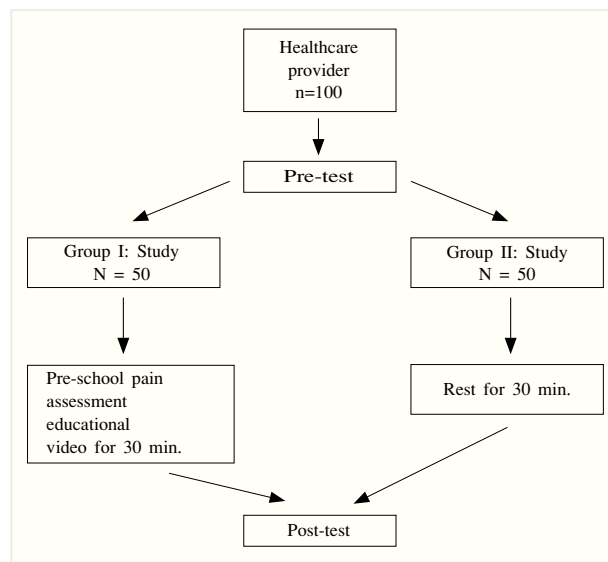
The positive effect of video teaching on patients and parental knowledge in pediatric pain management, reducing anxiety about treatment and increase understanding about the procedures has frequently been published.<sup>7-10</sup> However, in our study we examined the effectiveness of this method on the ability of healthcare providers to assess pain by observational (behavioral) measures which are commonly used in our institute: CHEOPS and FLACC scales.

The reliability and validity of CHEOPS and FLACC has been well established in many studies.<sup>11</sup> Suraseranivongse S, et al., had validated the translated Thai versions in preschool children and found them to be valid, reliable and practical to assess postoperative pain.<sup>12-13</sup> These scores have also been used by parents of ambulatory pediatric patients with good agreement and correlation.<sup>14</sup>

In our study, there were no differences between control and study group in pre-test scoring using CHEOPS and FLACC scales. In both groups post-test scorings improved compared to pre-test (Table 3).

Surprisingly the study group compared to control not only had the similar post-test results, but needed more time for scoring. The possible explanations include the scoring sheet which was quite simple and easy to understand, which is one reason why it is used for parents assessing pain in pediatric ambulatory settings<sup>14</sup>. This may be underlined by the results of Colwell et al.<sup>15</sup>, demonstrating children's self report being similar to nurses' pain intensity assessment. For the longer time the study group needed for scoring, they might have been somewhat exhausted from watching and doing exercises (during the last part of the video). Finally the control group probably might have mobilized some memory during the rest period.

In the study group 29 participants evaluated the edu-

**Appendix 1.** Flow of participants through the randomized controlled trial.

cational video as helpful and easy to use. They confirmed a better confidence to assess pain in pediatric patients having improved their understanding about pain assessment (Table 4).

Educational videos are one of various methods for education in healthcare providers. However, we couldn't show any significant improvement from viewing the video compared to resting, and obviously considering control group. Pain assessment and treatment decisions of health providers may depend on different factors such as education, personal experience and age.<sup>15-16</sup> One study found the effect of video education being less than average in parents with high education or who had been exposed to pain management.<sup>10</sup> The participants in this study were adult learners who already had some knowledge, although not fundamental. Thus, the educational video may had less effect compared with learning by sharing experience or group discussion.<sup>17</sup>

In conclusion, healthcare providers need more selective educational measures to improve their ability and confidence in assessment of pediatric pain. The validated scoring sheet is very useful and should become standard procedure in every pediatric ward. The value of educational video is unclear. Up to now it can only assist traditional learning methods. The video itself should be upgraded for better interactive qualities and comprehensibility.

### Limitations

This research has some limitations. The participants were all healthcare providers who already had some

**TABLE 4.** Participants evaluation of the preschool pain assessment educational video (1 = strongly disagree to 5 = strongly agree).

Item	Mean (SD)
1 The educational video was well organized	4.1 (0.72)
2 The educational video was presented clearly	4.0 (0.65)
3 The study of this material will improve my ability to assess pain in pediatric patient	4.2 (0.73)
4 This educational video was easy to use	4.0 (0.6)
5 Having completed this material, I feel confident to assess pain in pediatric patient	4.0 (0.7)
6 The educational video increase my understanding of pediatric pain assessment	4.1 (0.8)
7 Video clip exercise improved my understanding of the pediatric pain assessment	4.2 (0.6)

**Appendix 2.** CHEOP and FLACC pre-test and post-test answer sheet.

CHEOPS									
Item	Crying	Facial expression	Verbalization	Activity of Torso	Touching	Response of lower limbs	Score	Treatment Time decision	Time required
	1=No crying	0=smile	0=Positive	1=neutral	1=no touching	1= neutral			
	2=Moaning, Crying	1=Composed	1=None, other complaints	2=shifting, tense, shivering, upright, need for restraints	2= reaching, Grabbing, need for restraint	2= squirming or kicking, draws up or tensed, standing, need for restraint			
	3=Screaming	2=Grimacing	2=complaints about pain, both type of complaints					(yes/ no)	
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									

FLACC								
Item	Face	Legs	Activity	Crying	Consol ability	Score	Treatment Time decision	Time required
	0=Noarticular expression or smile	0=Normal position or relaxed	0=Lying quietly, normal position, moves easily	0=No cry	0=Content, relaxed			
	1=Occasional grimace frown, withdrawn, or disinterested	1=Uneasy, restless, tense	1=Squirming, shifting back and forth, tense	1=Moans or occasional complaint	1=Reassured by hugging or being talked to, distractible			
	2=Frequent to constant quivering chin, clenched jaw	2= Kicking, or legs drawn up	2=Arched, rigid or jerking	2=Crying steadily, screams or sobs, frequent complaints	2=Difficult to console or comfort			(yes/ no)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

**Appendix 3.** Educational video evaluation form.

Item	1= strongly disagree to 5=strongly agree)
1 The educational video was well organized	1 2 3 4 5
2 The educational video was present clearly	1 2 3 4 5
3 The study of this material will improve my ability to assess pain in pediatric patient	1 2 3 4 5
4 This educational video was easy to use	1 2 3 4 5
5 Having completed this material, I feel confident to assess pain in pediatric patient	1 2 3 4 5
6 This educational video increase my understanding of pediatric pain assessment	1 2 3 4 5
7 Video clip exercise improved my understanding of the pediatric pain assessment	1 2 3 4 5

experience which may have affected their assessment independent from the video. Further studies have to include participants of different levels of education.

We did not assess the long term effect of the video education on consistency of knowledge and skill in clinical practice.

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