

## Brief Report

# Comparison of Visual Analogue Scale and Faces Rating Scale in Measuring Acute Postoperative Pain

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Several pain assessment tools have been proposed for use in different settings, but neither have been validated for all patients, especially Iranians.

We conducted this study to compare the accuracy of two most commonly used tools for evaluation of pain intensity in a group of postoperative Iranian patients.

All postoperative patients admitted to the surgical wards of Masih Daneshvari and Rasoul Akram Hospitals, Tehran, Iran were studied. During a two-month period, patients were evaluated for pain intensity within 24 hours of operation. Visual analogue scale and faces rating scale were used for this purpose.

Eighty-two patients were enrolled into the study. Forty-eight patients underwent obstetrics and 34 had general surgeries. Using Spearman analysis, we found a linear correlation between the results of the two methods ( $P=0.952$ ). Using multivariate analysis, we found that none of the variables such as age, gender, and education level had significant effects on correlation between visual analogue scale and faces rating scale.

Visual analogue scale and faces rating scale are two pain assessment tools that can be used interchangeably for evaluation of acute postoperative pain.

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**Keywords:** Faces rating scale (FRS) • pain • visual analog scale

## Introduction

According to the American Pain Society, pain has been defined as “an unpleasant sensory and emotional experience with actual or potential tissue damage or described in terms of such damage.”<sup>1,2</sup>

Various pain measurement scales have been developed but none has been fully qualified for all patients. On the other hand, using these tools interchangeably is still not justified.

Daily clinical practice implies the fact that there is a need for at least two equally reliable methods to be used interchangeably in especial circumstances, because some patients seem to have difficulties in interpreting pain scales and some

lack the ability of abstract thinking required for most pain assessment instruments.<sup>3</sup> For example, researchers have reported that 7 – 11% of patients are unable to complete the visual analogue scale (VAS) or find it confusing.<sup>4,5</sup>

Regarding the variety of tools proposed for pain assessment, VAS and faces rating scale (FRS) are qualified for the purpose but neither has been evaluated for use in Iranian patients.

We conducted this study to assess the level of agreement between the two available pain assessment tools, VAS and FRS for evaluation of pain in a group of postoperative Iranian patients.

## Materials and Methods

This cross-sectional study was performed on postoperative patients admitted to the surgical wards of Masih Daneshvari and Rasoul Akram Hospitals, Tehran, Iran during a two-month period (May and July 2005).

This research was approved by the Ethical Committee of National Research Institute of

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Tuberculosis and Lung Disease and all the patients expressed their consent for cooperating with the interviewers.

All patients, within 24 hr of operation who were conscious enough to cooperate, were enrolled into our study. The cases were grouped according to the type of surgery into two groups: "obstetric group" and "general surgeries group."

All patients with history of drug addiction or those in unstable and unconscious states were excluded from the study.

To perform pain evaluation, VAS, consisting of a ruler marked from 0 to 10, and FRS with seven facial expressions of pain, from happy (scored 0) to agonized (scored 6), were used.

To eliminate recall bias, the patients were randomly allocated into two groups. The patients in the first group were evaluated by VAS initially formed and then by FRS. For the second group, FRS evaluation was first and then VAS was used. In each group the time interval between performing the two examinations was not more than few minutes.

### Statistical analysis

Demographic characteristics (age and gender) are presented as mean±standard deviation (SD) and range. Spearman's rank correlation coefficient ( $\rho$ ) test was used to evaluate the association between the VAS and FRS in the total patients.

Using regression analysis we assessed the correlation between VAS and FRS by control of age, gender, and education.

## Results

A total of 82 patients were enrolled into the study and categorized into two groups: 48 patients in the obstetric group and 34 patients in general surgeries group.

The mean age±SD (range) of the patients was  $32\pm13.8$  (15 – 70); for the patients in the obstetric group it was  $27\pm7$  (15 – 54), and for the patients in the general surgeries group  $38\pm17.8$  (16 – 70) ( $P<0.001$ ). The number of female patients was significantly higher due to the large number of obstetric patients (59 versus 23). Considering the educational status of the patients, none of the patients had university degrees and the number of patients in the three groups was quite similar, according to their education, (primary, middle, and high school).

Spearman's rank correlation coefficient examination revealed a strong and linear correlation between the results of VAS and FRS tests among the patients ( $r=0.952$ ,  $P<0.001$ ) (Figure 1).

Multiple regression analysis results revealed that none of the variables such as age, gender (dummy variable), and education, contributed significantly to VAS. Only FRS had significant effect on VAS ( $P<0.001$ , Table 1).

VAS and FRS results showed a high correlation within obstetric and general surgeries groups ( $r=0.676$  and  $r=0.90$ ,  $P<0.001$  and  $P<0.000$ , respectively).

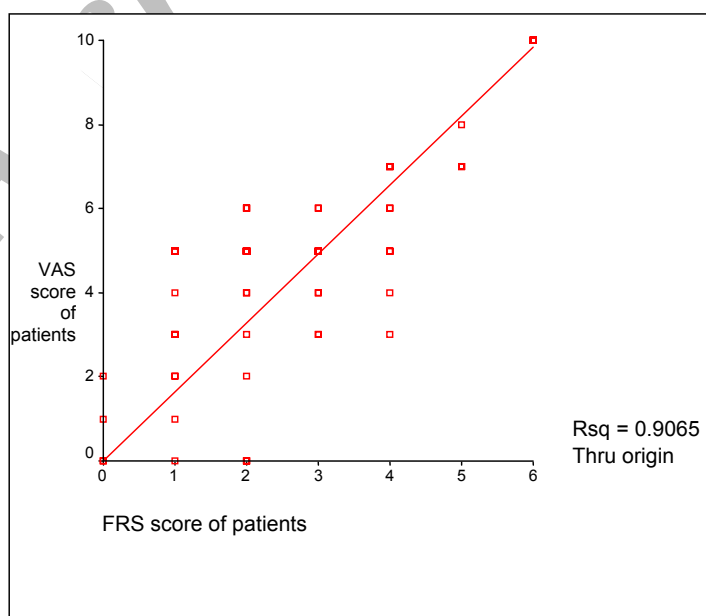


Figure 1. Scatter plot to show correlation between VAS and FRS results.

**Table 1.** Output for multiple regression analysis to define the effects of FRS, age, gender, and education on VAS results.

Model	Unstandardized coefficients		Standardized coefficients	t	Significant
	B	SE	Beta		
1 (constant)	1.925	0.897	—	2.147	0.035
Age	0.010	0/013	0.57	0.765	0.447
FRS	1.170	0.104	0.775	11.293	0.000
Gender	-0.665	0.400	-0.123	-1.662	0.101
Education	-0.006	0.47	-0.010	-0.139	0.890

VAS=visual analogue scale; FRS=faces rating scale; SE=standard error.

## Discussion

Our study showed a strong correlation between VAS and FRS in an Iranian sample of patients.

Several studies have evaluated the accuracy of each method and some have compared their results.<sup>6,7</sup> VAS is considered a very popular tool for pain assessment. In a study conducted by Salo et al., it was shown that VAS could be used with high accuracy by discharged patients at home, without use of expert help.<sup>8</sup> de Boer et al. have shown that VAS is a sufficiently reliable tool to be used even in acute pain settings,<sup>10</sup> and in clinical trials to assess global quality of life.<sup>10</sup> But this tool has its own disadvantages. Illiterate, uncooperative, and especially children have problem using it.

Our patients consisted of a homogeneous group of rather low education, who usually have problem in interpreting pain scales.

We evaluated VAS and FRS in postoperative patients with acute pain who had undergone various operations. We concluded that these two methods had enough correlation to be used interchangeably and that this correlation was linear. In a study by Freeman et al.,<sup>6</sup> this correlation was considered nonlinear but strong. And it was said that the patients' reply might have been influenced by the numbers indicated under each facial expression. We eliminated this mistake by omitting the numbers under each face. Also, we systematically randomized the patients regarding the sequence of performing the evaluations and therefore avoiding recall bias. All of these resulted in a linear and strong correlation between the two scales.

According to our study, age, gender, educational level, culture, and type of surgery seem not to be important confounding factors to interfere with accurate test results.

All these findings along with the feasibility of utilization makes the FRS tool (a version with seven facial expressions) a reliable alternative for

VAS in evaluating acute postoperative pain.

VAS is considered the most reliable method of pain assessment. But, as an alternative, FRS can be used interchangeably in assessment of acute postoperative pain.

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