

Evaluation of Post Operative Pain in Rural Areas of Jhalawar District by Comparing Four Pain Scales

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ABSTRACT

Introduction: Visual Analogue Scale, Numerical Rating Scale, Verbal Rating Scale, Faces Pain Scale and McGill Pain Questionnaire are most commonly used Pain Rating Scales among clinicians. This study was done to compare literacy and socio-economic status on the ability to appreciate pain rating on Visual Analogue Scale, Verbal Rating Scale, Numerical Rating Scale and Face Rating Scale in post-operative patients of rural areas of Jhalawar District. Agreement between these scales was also reviewed.

Material and Methods: Permission to work on this study was taken from the Ethical committee. Informed written consent was taken from the patients and their attendants for operative procedures under any type of anaesthesia. Post surgery, patients who were conscious, coherent and with stable haemodynamic status were asked to rate levels of pain in all four types of pain scales after 24 hours of surgery and within 5 minutes interval of each other. Post- Operative pain control will be the same for all patients and will be given Inj. Tramadol, 50 mg 8 hourly and Inj. Diclofenac 50 mg 8 hourly. Chi Square test and Multivariate Regression analysis were done for data analysis.

Results: 125 patients, who came under eligible criteria, participated In this study. No significant association was obtained for any of the variables except education and socio-economic status with VAS and NRS.

Conclusion: All the four pain rating scales are valid, reliable and appropriate for use in clinical practice. Visual Rating Scale has more practical difficulties than other three pain rating scales.

Keywords: Visual Analogue Scale, Verbal Rating Scale, Numerical Rating Scale, Face Rating Scale, Pain Rating Scales, illiteracy, rural, socio-economic status.

INTRODUCTION

Pain is a subjective phenomenon which is difficult to define. The single main domain assessed most often in clinical research settings is pain intensity or the magnitude of felt pain.¹

Various pain measurement scales by which pain can be assessed such as Visual Analogue Scale (VAS), Numerical Rating Scale (NRS), Verbal Rating Scale (VRS), Face Pain Scale (FPS) and McGill Pain Questionnaire (MPQ²) are used in clinical practice but in our study MPQ was not used. Evidence supports the reliability and validity of each of these measures across population³ 74% of the Indian population is literate while 26% is illiterate out of which 35% are females.⁴ Aim of study was to evaluate and explore appropriate pain scale among these four pain scales, which will prove to be more effective in management of post-operative surgical pain in rural population. Valid and reliable pain assessment is essential for successful pain care.

No measure is perfect. No measure assesses all pain domains, nor is any single measure useful in all settings and with all population whether rural or urban, literate or illiterate or lower

and higher socio-economic status.

MATERIAL AND METHODS

Present study was carried out at Zenana Hospital, Jhalawar Medical College, Jhalawar. A total of 125 Gynaecological and Obstetrical patient were selected as per eligibility criteria, who were operated at Zenana Hospital for different surgeries. They were between age of 10 years to 50 years. The study was done after 24 hours of surgery in post- operative period. Most of the patients were rural, of different educational status and of different socio-economic status. Inj. Tramadol 50mg, 8 hourly and Inj. Diclofenac 50mg, 8 hourly was given as routine.

Permission for the study was granted by Ethical committee authorities. A well informed written consent was taken from the patients and their attendants for the surgical procedures under any type of anaesthesia. They were told about this study in detail.

Exclusion criteria: 1. Patients who refused participation. 2. Having congenital or physical disability. 3. H/O any medical problems such as cancer, heart disease, stroke, epilepsy, diabetes etc. 4. Unconscious patients and unstable haemodynamic condition. They were excluded.

Pain Rating Scales: Four pain rating scales were used for this study.

Visual Analogue Scale: It is presented as a 10cm. line, which is marked 0 to 10. 0 means no pain and 10 means worst pain. The patient is asked to place a mark on the line in dictating level of their pain.

Verbal Rating Scale: In this scale five perpendicular lines were marked on a horizontal line. Lines from left to right were denoted with words as no pain, mild pain, moderate pain, intense pain and worst pain. The patient was asked to select a single word that characterises the pain intensity.

Numerical Rating Scale: Numerical rating scale is a 11 or 101 points scale, where the end points are extremities of No pain and Worst pain. It can be verbally delivered. The patient is asked to choose the number that best describes the intensity of pain

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which they are feeling.

Faces Pain Scale: This have six faces from left to right. In which face point to left most face showing no pain. The faces show more and more pain from left to right up to the point to the right most face which shows severe pain. Happy face (no pain), still smiling (hurts just a little bit), still not smiling (hurts a little more), starting to frown (hurts even more), definitely frowning (hurts a whole lot) and crying face (severe and non-tolerable pain).

Patients were asked to rate pain 24 hours after surgery while taking routine pain killers as described above. They were asked to rate pain on all four pain scales one by one after a gap of 5 minutes in each of the scale and was asked only once.

STATISTICAL ANALYSIS

Data analysis was done using SPSS software and Chi square with multivariate logistic linear regression analysis.

RESULTS

A total of 125 patients were enrolled in this study. Out of 125 patients, 29 patients were of age group 10-20 years (23.2%), 79 patients were of age group 21-30 years (63.2%), 13 patients were of age group 31-40 years (10.4%) while 4 patients were of age group 41-50 years (3.2%).

45 (36%) of the respondents were illiterate and 46 (36.8%) were up to primary level. 103 (82.4%) patients were Hindu and 22 (17.6 %) were Muslims. 70 (56.0%) patients were poor and 53 (42.4%) were of lower class in their social-economic status (table-1).

Out of 125 patients enrolled, 98 (78.4%) patients could rate their pain on visual analogue scale; while in spite of probing, 27 (21.6%) could not rate their pain on VAS. The same patients were asked to rate pain on the numeric analogue scale within 5 minutes of the first rating.

On the numeric analogue scale, 98 (78.4%) patients could complete numerical analogue scale while 27 (21.6%) patients could not complete numerical analogue scale. 104 (83.2%) patients were of Obstetrics Surgery and 11 (8.8%) patients were of Gynaecological surgery. Operative timing of 87 (69.6%) patients was more than 30 Minutes. Out of 125 patients, 115 (92%) patients received Spinal Anaesthesia. This is depicted in Surgical characteristics such as type of surgery, duration of surgery, type of anaesthesia, age, religion, education and socio- economic status. They were cross tabulated with the ability to rate pain on all four scales in univariate analysis and no significant association was obtained for any of the variables except Education and Socio-Economic status with VAS and NRS. The significance values are depicted in Table-2.

After univariate analysis we found only Education and Socio-Economic status were significantly associated with VAS and NRS. In Multivariate analysis of these two variables Socio-Economic status was most common cause for ability to rate pain in VAS Scale and NRS Scale ($P < 0.05$) in respect to Education status (table-2 and 3). Multivariate analysis was not used in VRS Scale and FPS Scale because no variable was significantly associated with that parameters in univariate analysis (table-3).

DISCUSSION

Reliable and Valid pain assessment is essential for successful

Variables	Numbers	Percentage
Age		
10 Yrs. To 20 yrs.	29	23.2%
21 Yrs. To 30 yrs.	79	63.2%
31 Yrs. To 40 yrs.	13	10.4%
41 Yrs to 50 yrs.	04	3.2%
Religion		
Hindu	103	82.4%
Muslim	22	17.6%
Educational status		
Illiterate	45	36%
Primary	46	36.8%
Secondary	30	24%
Graduate	04	3.2%
Social status		
Poor	70	56%
Lower	53	42.4%
Upper	02	1.6%
Type of surgery		
Gynaecological	11	8.8%
Obstetrics	104	83.2%
Others	10	8%
Type of anaesthesia		
Spinal	115	92%
G. A.	10	8%
Duration of surgery		
< 30 Minutes	38	30.4%
30 Minutes to 2 hours	87	69.6%
Ability to rate pain on VAS		
Yes	97	77.6%
No	28	22.4%
Ability to rate pain on NRS		
Yes	97	77.6%
No	28	22.4%
Ability to rate pain on VRS		
Yes	111	88.8%
No	14	11.2%
Ability to rate pain on FPS		
Yes	116	92.8%
No	09	7.2%
Total	125	100%

Table-1: Baseline characteristics and ability to rate pain on VAS, VRS, NRS and FPS

pain management. Validity refers to the Appropriateness, Meaningfulness and Usefulness of a measure for a specific purpose. It is seen as the most important consideration in the evaluation of a measure.⁵

The affective quality of pain includes both the general unpleasantness, as well as many varieties of affect as fear, anger, sadness, frustration and feeling of hopelessness especially as it becomes chronic. Patients appear to treat single item VAS, NRS and VRS measures of pain unpleasantness much like measures of pain intensity, so that the two are often indistinguishable from one another in clinical populations.^{6,7}

Of the three primary pain intensity measures used most often in pain assessment, evidence indicates that VRS tend to be easier for patients to understand and use than NRS, and the NRS are easier for patients to understand and use than VAS^{8,9}, thus making simple VRS, a natural choice to consider. FPS, consist

	VAS			Chi sq P Value			NRS			Chi sq P Value			VRS			Chi sq P Value			FPS			Chi sq P Value			Total			
	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	Able to Rate		Not Able to Rate	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age																												
10 - 20 Years	22	22.4%	7	25.9%	22	22.4%	7	25.9%	0.432	0.432	27	22.9%	2	28.6%	28	23.3%	1	20.0%	0.660	0.660	29	23.2%	29	23.2%	29	23.2%	29	23.2%
21 - 30 Years	62	63.3%	17	63.0%	62	63.3%	17	63.0%			75	63.6%	4	57.1%	76	63.3%	3	60.0%			79	63.2%	79	63.2%	79	63.2%	79	63.2%
31 - 40 Years	11	11.2%	2	7.4%	11	11.2%	2	7.4%	(0.933)	(0.933)	12	10.2%	1	14.3%	12	10.0%	1	20.0%	(0.883)	(0.883)	13	10.4%	13	10.4%	13	10.4%	13	10.4%
41 - 50 Years	3	3.1%	1	3.7%	3	3.1%	1	3.7%			4	3.4%	0	0.0%	4	3.3%	0	0.0%			4	3.2%	4	3.2%	4	3.2%	4	3.2%
Religion																												
Hindu	82	83.7%	21	77.8%	82	83.7%	21	77.8%	0.507	0.507	97	82.2%	6	85.7%	98	81.7%	5	100.0%	1.112	1.112	103	82.4%	103	82.4%	103	82.4%	103	82.4%
Muslim	16	16.3%	6	22.2%	16	16.3%	6	22.2%	(0.476)	(0.476)	21	17.8%	1	14.3%	22	18.3%	0	0.0%	(0.292)	(0.292)	22	17.6%	22	17.6%	22	17.6%	22	17.6%
Education																												
Illiterate	23	23.5%	22	81.5%	23	23.5%	22	81.5%	31.017	31.017	40	33.9%	5	71.4%	42	35.0%	3	60.0%	1.434	1.434	45	36.0%	45	36.0%	45	36.0%	45	36.0%
Primary	43	43.9%	3	11.1%	43	43.9%	3	11.1%			44	37.3%	2	28.6%	45	37.5%	1	20.0%			46	36.8%	46	36.8%	46	36.8%	46	36.8%
Secondary	28	28.6%	2	7.4%	28	28.6%	2	7.4%	(<0.0001*)	(<0.0001*)	30	25.4%	0	0.0%	29	24.2%	1	20.0%	(0.698)	(0.698)	30	24.0%	30	24.0%	30	24.0%	30	24.0%
Graduate	4	4.1%	0	0.0%	4	4.1%	0	0.0%			4	3.4%	0	0.0%	4	3.3%	0	0.0%			4	3.2%	4	3.2%	4	3.2%	4	3.2%
Social Status																												
Poor	46	46.9%	24	88.9%	46	46.9%	24	88.9%	15.155	15.155	63	53.4%	7	100.0%	66	55.0%	4	80.0%	1.235	1.235	70	56.0%	70	56.0%	70	56.0%	70	56.0%
Lower	50	51.0%	3	11.1%	50	51.0%	3	11.1%	(0.001*)	(0.001*)	53	44.9%	0	0.0%	52	43.3%	1	20.0%	(0.539)	(0.539)	53	42.4%	53	42.4%	53	42.4%	53	42.4%
Upper	2	2.0%	0	0.0%	2	2.0%	0	0.0%			2	1.7%	0	0.0%	2	1.7%	0	0.0%			2	1.6%	2	1.6%	2	1.6%	2	1.6%
Type of Surgery																												
Gynecological	7	7.1%	4	14.8%	7	7.1%	4	14.8%	4.187	4.187	10	8.5%	1	14.3%	10	8.3%	1	20.0%	1.166	1.166	11	8.8%	11	8.8%	11	8.8%	11	8.8%
Obstetrics	81	82.7%	23	85.2%	81	82.7%	23	85.2%	(0.123)	(0.123)	98	83.1%	6	85.7%	100	83.3%	4	80.0%	(0.558)	(0.558)	104	83.2%	104	83.2%	104	83.2%	104	83.2%
Others	10	10.2%	0	0.0%	10	10.2%	0	0.0%			10	8.5%	0	0.0%	10	8.3%	0	0.0%			10	8.0%	10	8.0%	10	8.0%	10	8.0%
Duration of Surgery																												
<30 minutes	33	33.7%	5	18.5%	33	33.7%	5	18.5%	2.298	2.298	36	30.5%	2	28.6%	37	30.8%	1	20.0%	0.266	0.266	38	30.4%	38	30.4%	38	30.4%	38	30.4%
30 minutes to 2 hours	65	66.3%	22	81.5%	65	66.3%	22	81.5%	(0.130)	(0.130)	82	69.5%	5	71.4%	83	69.2%	4	80.0%	(0.606)	(0.606)	87	69.6%	87	69.6%	87	69.6%	87	69.6%
Anaesthesia																												
Spinal	88	89.8%	27	100.0%	88	89.8%	27	100.0%	2.995	2.995	108	91.5%	7	100.0%	110	91.7%	5	100.0%	0.453	0.453	115	92.0%	115	92.0%	115	92.0%	115	92.0%
G.A.	10	10.2%	0	0.0%	10	10.2%	0	0.0%	(0.084)	(0.084)	10	8.5%	0	0.0%	10	8.3%	0	0.0%	(0.501)	(0.501)	10	8.0%	10	8.0%	10	8.0%	10	8.0%
Total	98	100.0%	27	100.0%	98	100.0%	27	100.0%			118	100.0%	7	100.0%	120	100.0%	5	100.0%			125	100.0%	125	100.0%	125	100.0%	125	100.0%

Table-2: Distribution of Different social demographic variable with VAS, NRS, VRS and FPS

Variable	VAS			NRS		
	β	SE	P value	β	SE	P value
Education	16.331	2.368	0.998	16.331	1.096	<0.0001
Socio-Economic Status	17.397	1.096	<0.0001*	17.397	1.096	<0.0001

Table-3: Multiple Logistic Regression for VAS and NRS

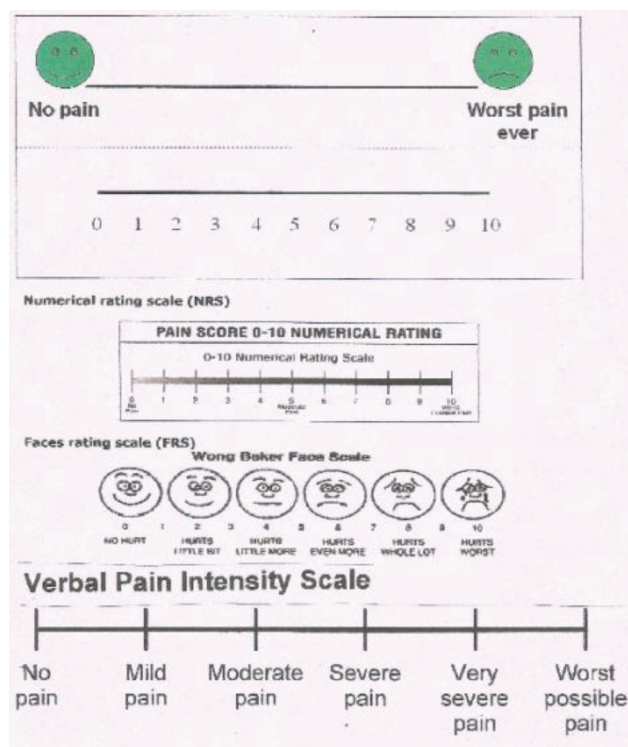


Table-4: Different Pain Scales

of line drawing of faces, each of which represents expressions that communicate different levels of pain and distress. This is more useful in children below the age of 12 years.¹⁰ Pain affect can also be assessed using multiple-item scales, the most common of which are the affect subscale of the McGill Pain Questionnaire (MPQ²), but in our study we have not included. Although all four scales (Table-4) can be option of patients in post-operative period to report pain intensity, however no significant differences were noted in terms of age, sex and educational level.¹¹ Similarly using multivariate analysis, none of the variables such as age, gender and educational level had significant effects on correlation between VAS and FPS.¹²

In our study no significant association was found for any of the variables except education and socio-economic status with VAS and NRS. The significance value is < 0.0001 and 0.001 in socio-economic status and educational in VAS and NRS. It can be explained by the differences in socio-economical characteristics of the studied sample.^{13,14} Our study was done in rural patients and in this we found that education can not be hindrance in assessment and management of pain in post-operative period. We found some differences in the relative responsibilities with NRS being the most responsive followed by VAS, VRS and FPS. This is constant with the previous studies demonstrating the superiority of NRS and VAS responsiveness.¹⁵ In our study NRS had shown to be slightly more responsive than VAS. The socio-economic status And education levels were significantly associated with VAS and NRS, but VRS and FPS scales have no been significantly associated.

CONCLUSION

With the use of pain rating scales, patients are able to communicate their pain experience and their response to treatment. Patients prefers the NRS when they want sensitivity and VRS for simplicity but the evidence is not conclusive. VAS is most difficult of the four pain rating scales to use in clinical practice.

Education and Socio-Economical status were significantly associated with VAS and NRS but were not significantly associated with VRS and FPS.

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ABBREVIATIONS

VAS- Visual Analogue Scale

VRS- Verbal Rating Scale

NRS- Numerical Rating Scale

FPS- Face Pain Scale

MPQ- McGill Pain Questionnaire

SPSS- Statistical Package for the Social Sciences

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