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Is the Verbal Numerical Rating Scale a Valid Tool for Assessing Pain Intensity in Children Below 8 Years of Age?

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Abstract: The verbal numerical rating scale (vNRS-11) is one of the most widely used scales for assessing pediatric pain intensity. The literature shows that it is a valid instrument for assessing pain intensity in children above 8 years of age. The aim of this work was to study whether the vNRS-11 is also a valid instrument when it is used with Catalan-speaking children between 6 and 8 years old. A total of 126 schoolchildren (mean age, 6.87; SD, .68) were interviewed individually. Participants reported the maximum intensity of the most frequent pain they had experienced in the previous 3 months, and the intensity they would experience in 3 circumstances, using the vNRS-11 and other widely used scales: the Faces Pain Scale-Revised (FPS-R), the mechanical visual analog scale (VAS), and the colored analog scale (CAS). They rated their affective state in relation to the pain experience and reported their pain-related disability. Participants also indicated which of the 4 scales they preferred. The vNRS-11 showed a high convergent construct validity (r = .73–.86), adequate discriminant validity (z = 2.05–5.55), and adequate criterion-related validity (r = .45–.70). The vNRS-11 was the second most preferred scale.

***Perspective:** This study contributes to the increasing literature that supports the use of the vNRS-11 to assess pain intensity in children. Specifically, it shows that it can be used in children as young as 6 years of age.*

***Key words:** Children, pain intensity, assessment, verbal numerical rating scale, self-report.*

The numerical rating scale (NRS), and particularly the verbal 11-point version (vNRS-11), is one of the most widely used self-report instruments for assessing pain intensity in children. It has been extensively used in clinical and research work despite the lack of validation data for such a population. In recent years, however, there has been a significant increase in the number of studies assessing the properties of the NRS-11 when used in children. Several studies have been published on the positive psychometric properties of the scale: reliability[1] and validity, specifically content validity[1]; construct validity (which has been supported by both convergent[7,18,21,30]and discriminant validity,[7,18,21]); and criterion validity, supported by both concurrent[1,18] and predictive validity.[18] Similarly, preliminary results about the responsivity/sensitivity to change[7,21] and interpretability[1,27]of the NRS scores reported by children have also been provided recently. Agreement between the ratings on the NRS-11 and other self-report scales is a topic that requires further attention due to the controversial nature of the results available.[2,21,22,30]

Generally speaking, and taking the results of these studies as a whole, it can be concluded that the NRS-11 is an adequate scale for reporting and measuring pediatric pain intensity. It seems to be as good as any of the most commonly used self-report instruments for measuring pain intensity in children, or at least in those children who can understand the meaning of the numbers used in the scale.[6] In this respect, there seems to be a consensus among clinicians and researchers that 8 to 9 years is the minimum appropriate age for using the NRS-11.[29] In fact, most of the studies mentioned above have tested the NRS-11 in children between 8 and 18 years of age. Nevertheless, some studies have implemented the NRS-11 in children below the age of 8. For example, von

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Baeyer et al[30] had some surgical patients of 7 years old, although it is not known how many. In Miró et al's study,[18] 8 surgical patients were 6 years old and 8 patients were 7. Similarly, Voepel-Lewis et al[27] reported that their sample of surgical patients was made up of children as young as 7 years old. One important issue in relation to the NRS-11 has to do with the age at which children are able to use the scale. Using the NRS-11 requires not only the ability to count but other abilities such as seriation, estimation, or classification. The aim of this study was to assess whether the NRS-11, when it is presented verbally, is a valid tool with children between 6 and 8 years of age. A secondary and complementary objective was to analyze which of the 4 intensity pain scales used in this study was the preferred one.

Method

Participants

To be eligible for this study, children had to fulfill the following inclusion criteria: 1) they had to be enrolled in first or second grade of primary education (aged between 6 and 7), although children in the second grade who had just turned 8 years old the week before the assessment were also included; 2) they had to be able to understand Catalan; and 3) they could not have any cognitive impairment that could interfere with the performance of the task.

Sample size estimations revealed that 82 participants would be needed to fulfill the main objectives of the study ($r = .3$; $\alpha = .05$ at 2-tailed; power = .80).[9] On the basis of previous studies with similar populations,[12] it was predicted that about 40% of the children approached would not consent to participate and/or fulfill the inclusion criteria. Therefore, 140 schoolchildren were invited to participate.

Measures

Pain Intensity

In addition to the NRS-11, we used 3 other pain intensity scales in this study. We chose these scales and not others because they are in widespread use and validation data with Catalan-speaking populations is readily available.

The vNRS-11 is a self-report instrument used to assess pain intensity in children. Participants are asked to score their pain intensity from 0 to 10, where 0 represents "no pain" and 10 "very much pain." It was given verbally, as it would have been in the clinical context, and we choose to refer to it as vNRS-11. The psychometric characteristics of the vNRS-11 have recently been provided for use in children over 8 years of age.[1,18,21,27,30]

The Faces Pain Scale–Revised (FPS-R)[19] is a self-report instrument also used to assess pain intensity in children. It is a widely recommended scale for assessing pediatric pain intensity. The scale consists of 6 faces that, from left to right, show increased pain intensity. The child has to choose the face that best reflects his/her pain intensity, and a numerical value from 0 to 10 (0, 2, 4, 6, 8, 10) is assigned to each face. The end points were explained as "no pain" and "very much pain." We used the Catalan version of this scale, which has shown good psychometric properties when used with children.[19]

The colored analog scale (CAS)[15] is a visual analog scale (VAS) that assesses the intensity of pain experienced. It consists of a mechanical device with a plastic frame that slides along a vertical tetragon. At the bottom it is white, 10 mm wide, and has a label of "no pain"; at the top it is dark red, 30 mm wide, and has a label of "very much pain." Thus, pain intensity is identified by width and color. The scale is printed on a sheet of plastic measuring 160 × 70 mm. The CAS is scored from 0 to 100 in increments of 1. This scale has proven to be a valid and reliable instrument in children as young as 5 years old.[15,20] Note that the original top anchor of the CAS is "most pain," but in order to avoid potential anchor effects on the pain ratings, we used the top anchor of the FPS-R with all 4 scales.

The VAS consists of a horizontal line, 100 mm long, anchored by pain descriptors at each end: "no pain" at the lower limit and "very much pain" at the upper limit. In this study we used a mechanical VAS (mVAS): participants were asked to move a marker along the line to the point that they felt represented their pain. The mVAS score is determined by checking the distance in millimeters from the extreme left of the line ("no pain") to the point that the participant has slid the marker on the back of the scale.

Pain-Related Affect

The facial affective scale (FAS)[15] is a self-report measure used to assess the unpleasantness of the child's pain experience. It has 9 faces that show gradual increases in distress, ranging from the happiest feeling possible to the saddest. The child's task is to choose the face that best fits his/her affective state. The FAS has been shown to be valid when used with Catalan-speaking young people.[19]

Pain-Related Disability

The Functional Disability Inventory (FDI)[31] is a self-report instrument that measures limitations in the activity of children and adolescents caused by pain. The child's task is to quantify the level of difficulty he or she experiences when performing certain common activities in different areas (school, home, recreation, or social interactions). It consists of 15 items that are scored on a 0 (no trouble) to 4 (impossible) scale; the higher the score, the greater the level of disability. In the present study, the inventory was administered verbally. The scale has been shown to have good psychometric properties.[5,31] In this study a psychometrically sound Catalan version of the FDI was used.[12,23]

Procedure

The procedure followed in the present study is similar to that in our previous work evaluating the psychometric

properties of the vNRS-11 when used with young people.[18]

The study was carried out between January and March 2011 and was approved by the Department of Education of the Catalan Government and by participating schools. The sample was a convenience sample of schoolchildren enrolled in first and second grades of primary schools in Tarragona (Spain), which were chosen for their proximity. A letter explaining the study and asking for the informed consent was sent to parents of those children who met the inclusion criteria. If they wished, they could ask questions about the study by email or by telephone. Only children whose parents consented to participate were included in the study. The study was also explained to the participants on the day of the interview, and they were required to give verbal consent at that moment to proceed with the interview.

Children were individually interviewed during school hours. Interviews were scheduled with the teacher to interfere as little as possible with the normal functioning of the classes. First of all, participants underwent a screening activity to make sure that they had the appropriate numerical skills to use the vNRS-11. For this purpose, we implemented 3 different activities following the suggestions of Besenski et al[4]: 1) counting (participants had to count from 0 to 10); 2) seriation (participants had to order 8 numbers, randomly selected from 0 to 10, along a horizontal line that had been divided into 11 parts); and 3) comparison (participants had to compare 8 pairs of numbers that were verbally presented by the interviewer and indicate which one was the highest). In order for participants to proceed to the interview, they had to respond correctly to 75% of the activities in each of the 3 tasks. If participants did not reach this minimum level, then they had to undergo a training task so that we could determine whether their reporting of the pain intensity score on the vNRS-11 could be improved. As described in the results section, all the participants successfully completed the 3 screening activities, so none of them had to undergo the training.

Following this initial screening phase, we first asked participants if they had experienced pain in any part of their body in the last 3 months. If the answer to this question was affirmative, we then asked about the highest intensity of the most bothersome pain they had experienced, which they had to report on the mVAS, the vNRS-11, the FPS-R, and the CAS, always in this order. They also had to report pain-related affect using the FAS and the extent they had been disabled by the most bothersome pain using the FDI.

Secondly, participants had to report pain intensity in the following situations selected from the Painful Events Inventory (PEI)[19]: 1) "You shut your finger in the door"; 2) "You are given an injection"; and 3) "You fall over and scrape your knees." Similar procedures have proved to be appropriate for studying self-report instruments assessing pediatric pain intensity.[3,15,30,32]

Participants were asked whether they had experienced these painful events or not. If the response was affirmative, they were asked to remember the moment and report how much it had hurt. If the response was negative, they had to report how much it would hurt if they were in those situations. Participants had to rate the intensity of their pain in the situations on the mVAS, vNRS-11, FPS-R, and CAS. They were also asked about pain-related affect in each situation using the FAS.

In accordance with the study procedure, participants not reporting pain in the last 3 months had to report only pain intensity and pain-related affect about the 3 PEI.

Participants did not see all the scales at the same time when they rated their pain intensity. Interviewers introduced 1 scale at a time. After 1 scale had been used, it was concealed before moving on to another one.

Finally, participants were asked to choose the pain intensity scale they preferred. The vNRS-11 was presented in the printed form to ensure that presentation mode did not affect the participant's choice. In this case, the interviewer showed the 4 scales at the same time, so that participants could see them all together. The scales were laid out on the table, in the following order, and from left to right, facing the child: mVAS, vNRS-11, FPS-R, and CAS.

Data Analysis

First, scatter plots were created to show the linear relationship between the scores on the vNRS-11 and the other 3 pain intensity scales used in this study: the FPS-R, the mVAS, and the CAS.

Then, construct validity was analyzed. On the 1 hand, convergent validity was calculated by correlating the participants' pain intensity ratings on the vNRS-11 with those on the other 3 scales.[25,26] It was assumed that ratings on the vNRS-11 and those on the other pain intensity scales would correlate highly because all 4 measures assess the same construct.[19,22] The convergent correlation had to be equal or greater than .3 to .5.[26] On the other hand, discriminant validity was estimated by comparing 2 dependent correlations on the same sample by using Fisher's z-transformation.[24] Specifically, we compared the magnitude of the correlation coefficient between ratings on the vNRS-11 and the FPS-R/mVAS/CAS with the magnitude of the correlation coefficient between ratings on the vNRS-11 and the FAS for each situation. It is assumed that correlations between the pain intensity scales will be significantly higher than the correlation between the vNRS-11 and the pain-related affect scores.[11,19]

Criterion validity was also analyzed. As the measures were administrated at the same time, concurrent validity was calculated. It was assumed that pain-related affect and disability can be predicted from pain intensity.[19,26]

Thus, concurrent validity was calculated by correlating the participants' pain intensity ratings on the vNRS-11 with participants' scores on the FAS and the FDI.

All these analyses were first conducted within the whole sample. We then examined the data again after dividing the participants into their school grade (first or second grade of primary education).

The preference percentage was also calculated for each scale. The percentages of children who chose the vNRS-11 were analyzed with particular focus on gender and grade.

Results

Sample Characteristics

A total of 140 schoolchildren were approached to participate in the study. Of these, 126 (90%) provided signed parental consent to participate. Thus, the sample was composed of 66 boys (52.4%) and 60 girls (47.6%) with a mean age of 6.87 (SD = .68).

All participants reported pain in some part of their body in the 3 months prior to the interview, and they had all experienced the 3 painful events extracted from the PEI and presented to them. A summary of sample characteristics can be found in Table 1.

Scatter Plots

Scatter plots showed that the relation between the scales was essentially linear. Figs 1–3 present the plots of the FPS-R, mVAS, and CAS scores against the vNRS-11 scores when participants rated the maximum intensity of the most bothersome pain in the previous 3 months. All other plots followed a similar pattern.

Validity of the vNRS-11

The Pearson correlation coefficients between the vNRS-11 and the other scales were strong and positive (between .73 and .86, for the whole sample; see Table 2) and supported convergent validity. Discriminant validity was also supported because the magnitude of the correlation coefficients between ratings on the vNRS-11 and the other pain intensity scales were greater than those between the vNRS-11 and the FAS in the whole sample. Two of the comparisons studied were not significant (see Table 2).

Criterion (concurrent) validity was supported by moderate-to-high and positive correlation coefficients between the vNRS-11 and the FAS (between .45 and .70 for the whole sample). However, the association between the vNRS-11 and the FDI was weak and nonsignificant (r = .11, P = .22 for the whole sample).

The correlation pattern was similar across grade groups (see Table 3).

Table 1. Participants' Descriptive Characteristics

Participants (n)	
Total sample	126
6 years	36
7 years	66
8 years*	22
Mean age (SD)	6.87 (.86)
Gender, n (%)	
Boys	66 (52.4)
Girls	60 (47.6)
Grade, n (%; mean age)	
1	60 (47.6; 6.37)
2	66 (52.4; 7.33)
Localization of the most frequent pain, n (%)	
Head	35 (27.8)
Neck	4 (3.2)
Upper extremities	8 (6.3)
Abdomen	46 (36.5)
Back	2 (1.6)
Genital	1 (.8)
Lower extremities	30 (23.8)

*Children who had just turned 8 years old the week before the assessment took place.

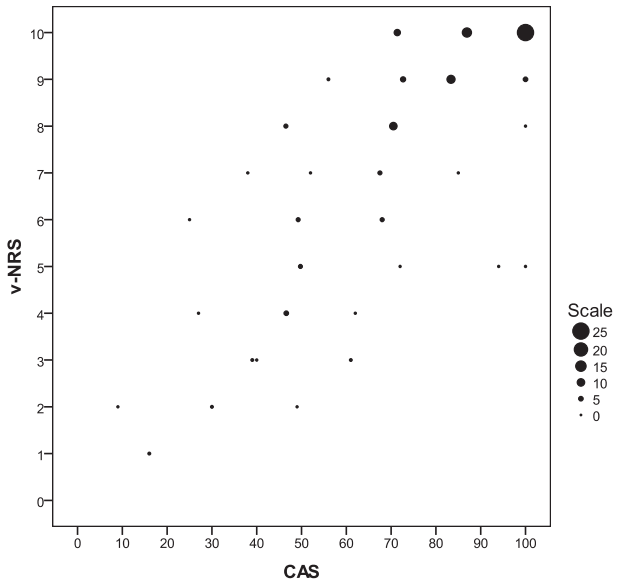

Figure 1. Scatter plots between CAS and vNRS-11 for the highest pain intensity of the most bothersome pain (whole sample).

Preference

Results of preference can be found in Table 4. In general, the most preferred scale was the CAS and the least preferred was the mVAS. The vNRS-11 was the second most preferred scale in all cases, and no differences were observed between the percentage of boys and girls that preferred the vNRS-11 to rate their pain (19.7% versus 18.3%, respectively; z = 1.16, P > .05). No differences

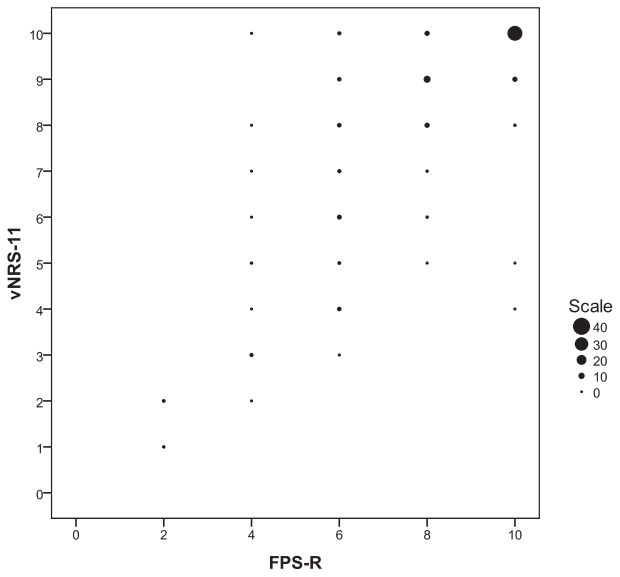

Figure 2. Scatter plots between FPS-R and vNRS-11 for the highest pain intensity of the most bothersome pain (whole sample).

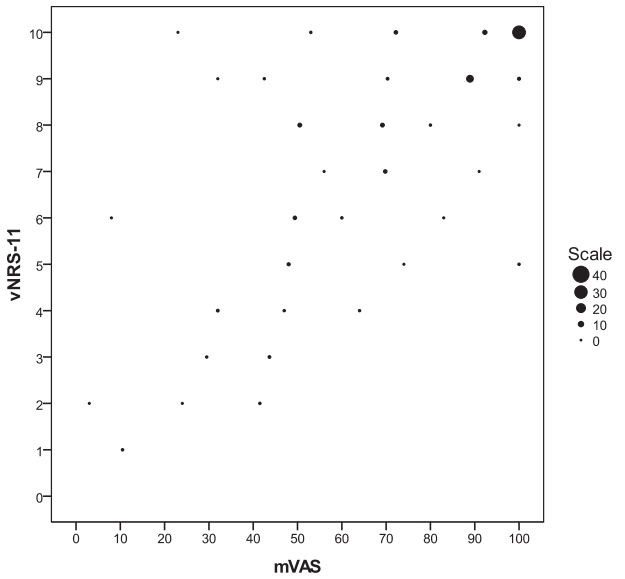

Figure 3. Scatter plots between mVAS and vNRS-11 for the highest pain intensity of the most bothersome pain (whole sample).

were found when the percentage of participants enrolled in first grade of primary education who chose the vNRS-11 was compared with the percentage in second grade (18.3 versus 19.7%, respectively; z = 1.16, $P > .05$).

Discussion

The objective of this study was to analyze the psychometric properties of the vNRS-11 when it is used to assess pain intensity in children between 6 and 8 years old. This study extends the findings reported in recent work[1,7,18,21,27,30] by showing that the vNRS-11 is a valid instrument for use with children below 8 years of age: specifically with children enrolled in first (6 and 7 years old) and second (aged 7 and just turned 8 years) grades of primary education. Our results support the validity of the scale (ie, convergent, discriminant, concurrent) when used with such a young population. Moreover, we found that none of the children participating in the study needed any specific training to understand and use the scale.

The validity (concurrent and criterion) of this scale was assessed in different situations. Each participant rated the pain intensity they felt in 4 different situations: that is, the most frequent pain in the last 3 months, and in 3 painful events. They also had to rate each situation on 4 widely used pain scales. All these options enrich the study and provide more evidence on the use of the vNRS-11 in younger children. It is important to note that all 3 situations extracted from the PEI had been experienced by our participants, so all reports were based on events that participants had experienced rather than on events they had imagined, thus resulting in greater precision of their self-reports.[28]

Convergent validity was supported in all cases by high positive correlations for the whole sample, and for the division into 2 subsamples (first and second grades of primary education). Particularly noteworthy are the high correlations between the vNRS and the FPS-R, a scale widely acknowledged as the current optimal pediatric pain measurement scale for the population participating in this study (McGrath et al, 2008).[16]

Discriminant validity was also supported by our results, and all correlations between the vNRS-11 and the pain intensity scales were greater than those between the vNRS-11 and the FAS. These results are similar to those in previous reports[19] but different from those in Goodenough et al,[10] who found that 8-year-old children provided equivalent ratings for pain intensity and pain unpleasantness. Although the vNRS-11 showed acceptable indices of concurrent validity for

Table 2. Validity of the vNRS-11 (Results of the Total Sample, n = 126)

	Maximum Intensity 3 Months	*PEI Item #1*	*PEI Item #2*	*PEI Item #3*
Construct validity				
Convergent				
vNRS-FPS-R	r = .75‡	r = .85‡	r = .86‡	r = .81‡
vNRS-VAS	r = .74‡	r = .74‡	r = .73‡	r = .84‡
vNRS-CAS	r = .79‡	r = .78‡	r = .78‡	r = .84‡
Discriminant				
vNRS-FPS-R	z = 4.68‡	z = 4.83‡	z = 4.88‡	z = 3.62‡
vNRS-FAS				
vNRS-mVAS	z = 4.64‡	z = 1.43	z = .66	z = 4.69‡
vNRS-FAS		$P = .15$	$P = .50$	
vNRS-CAS	z = 5.55‡	z = 2.47†	z = 2.05*	z = 4.69‡
vNRS-FAS				
Criterion validity				
Concurrent				
vNRS-FAS	r = .45‡	r = .67‡	r = .70‡	r = .64‡
vNRS-FDI	r = .11	—	—	—

*$P < .05$.
†$P < .01$.
‡$P < .001$.

Table 3. Validity of the vNRS-11 According to Participants School Course

	Maximum Intensity 3 Months	*PEI Item #1*	*PEI Item #2*	*PEI Item #3*
Grade 1 (n = 60)				
Construct validity				
Convergent				
vNRS-FPS-R	r = .74†	r = .85†	r = .86†	r = .82†
vNRS-mVAS	r = .79†	r = .70†	r = .67†	r = .85†
vNRS-CAS	r = .83†	r = .78†	r = .69†	r = .85†
Discriminant				
vNRS-FPS-R	z = 3.22*	z = 3.24*	z = 3.97†	z = 3.29†
vNRS-FAS				
vNRS-mVAS	z = 3.93†	z = −.37	z = −.14	z = 3.79†
vNRS-FAS		*P* = .70	*P* = .88	
vNRS-CAS	z = 4.41†	z = 1.70	z = .14	z = 3.86†
vNRS-FAS		*P* = .08	*P* = .88	
Criterion validity				
Concurrent				
vNRS-FAS	r = .44†	r = .67†	r = .66†	r = .59†
vNRS-FDI	r = .03	—	—	—
	P = .85			
Grade 2 (n = 66)				
Construct validity				
Convergent				
vNRS-FPS-R	r = .77	r = .86	r = .86	r = .77
vNRS-mVAS	r = .68	r = .78	r = .81	r = .83
vNRS-CAS	r = .72	r = .78	r = .88	r = .81
Discriminant				
vNRS-FPS-R	z = 3.50†	z = 3.56†	z = 2.56*	z = 2.97*
vNRS-FAS				
vNRS-mVAS	z = 3.43*	z = 1.64	z = 1.12	z = 4.76†
vNRS-FAS		*P* = .09	*P* = .25	
vNRS-CAS	z = 2.98*	z = 1.62	z = 3.19*	z = 4.19†
vNRS-FAS		*P* = .10		
Criterion validity				
Concurrent				
vNRS-FAS	r = .46†	r = .68†	r = .75†	r = .55†
vNRS-FDI	r = .21	—	—	—
	P = .10			

*$P < .01$.
†$P < .001$.

pain-related affect, the relationship with the FDI, which was also used as a criterion for concurrent validity, was not significant. This lack of correlation has also been observed in previous studies[8,17,18] and might be due to the homogeneity of the levels of disability in the study group. In this study, participants were a sample of schoolchildren suffering from low levels of disability.

According to the participants' stated preferences, the vNRS-11 was the second most favored scale, which shows that it is well accepted by participating children. Although studies in children show the FPS-R to be the preferred scale for reporting pain intensity,[18,19,21] in the present study the CAS was preferred. The fact that the CAS was a colorful and manipulative scale may have influenced participants' preferences. However, the mVAS used in the present study was also mechanical and it was the least preferred. It might be worthwhile for future work to study whether scale preferences vary if they are all administered using the same format (for example, on a hand-held computer or a smart phone).

Two related issues that still need to be clarified are the administration instructions and the description of the top verbal anchor. Von Baeyer (see http://www.usask.ca/childpain/research/nrs.html) provides data of an email survey in which clinicians revealed that the instructions and anchors they use in the clinical setting with the NRS-11 vary enormously. In the present study, we decided to use "very much pain," the same top anchor

Table 4. Preference of Self-report Scale

	FPS-R n (%)	*vNRS-11* n (%)	*CAS* n (%)	*mVAS* n (%)
Total sample (n = 126)	15 (11.9)	24 (19.0)	77 (61.1)	10 (7.9)
Grade 1 (n = 60)	9 (15.0)	11 (18.3)	37 (61.7)	3 (5.0)
Grade 2 (n = 66)	6 (9.1)	13 (19.7)	40 (60.6)	7 (10.6)
Boys (n = 60)	6 (9.1)	13 (19.7)	44 (66.7)	3 (4.5)
Girls (n = 66)	9 (15.0)	11 (18.3)	33 (55.0)	7 (11.7)

that had been validated for use with the FPS-R[19] and the CAS[20] in Catalan schoolchildren. Although this is not the usual top anchor for the vNRS-11, we wanted to minimize anchor effects on the children's pain score. Future studies might profitably analyze the development of common anchors for use across pain scales.

Another matter that deserves further attention is the screening of the children to determine whether they are capable of using the vNRS-11. In this study, we implemented 3 tasks that have been proved to identify whether a child has the ability to understand the quantitative meaning of the numbers used in the vNRS-11. All of the participants completed the screening tasks without any problem. As a matter of fact, the most recurrent comment when participants were solving the tasks was "It is so easy. We did it in class!" The recommended tasks may have been too easy and, therefore, not sensitive enough. However, this is highly unlikely because the correlations between scales were high and significant, as expected with children who understand the scale. Nevertheless, future studies might examine other strategies that have also been suggested.[4,28]

In order to examine the validity of the screening task, it would be interesting to compare the pain reports of those children who fail with those who pass. The screening test must contain tasks for evaluating the main capacities required if the pain intensity recorded with the vNRS-11 is to be valid and reliable, but it should also be brief. If not, it will not be clinically useful because determining whether the children are capable of using it and then administering it will be too time consuming.

Certain limitations should be taken into account when interpreting the study's findings. Our sample was a convenience sample, which might not be considered as representative. The participating schools were selected for their proximity and we did not know if the children experienced chronic or recurrent pain problems; this was a convenience sample of presumably healthy children. Future studies might explore whether familiarity with the scales, due to ongoing assessments, has any influence on their pain intensity reports and/or preference.

Participants were asked to recall pain in 4 different situations, a procedure that has been implemented in previous studies and found to be valid and reliable.[18,19,30] The studies available show high consistency and accuracy in the reports of children recalling their pain intensity.[14,33] However, we do not know whether divergences in the time elapsed since the occurrence of the pain event and the recall task had any influence on the results.

The presentation of the pain scales was not counterbalanced across participants and we do not know whether this might have influenced the results. In previous studies, however, we did not find any differences caused by the order in which the scales were presented: for example, when we compared the average pain intensity rated on the FPS-R and the NRS-11.[18]

Finally, in order to provide further information about the validity of vNRS-11, other measures should be used to analyze criterion validity. In the present study, we used the affective scale to calculate both discriminant and concurrent validity. Measures of pain-related interference or the impact of pain on the youngster's life (eg, social, family, or school functioning) may be good ways of examining whether these variables can be predicted from pain intensity determined by the vNRS-11.

Generally speaking, the results of the present work provide good evidence for the validity of the vNRS-11 when used with children enrolled in first and second grades of primary education, that is, children aged between 6 and 8. Nevertheless, further research is needed to definitively establish the psychometric properties of the vNRS-11 when used in children as young as the ones in our study. For example, future studies should focus not only on validity characteristics but on such other psychometric properties as reliability, sensitivity to change, or feasibility. Our results show that the scales are correlated, but we do not know whether the scales can accurately discriminate between different pain experiences.

Similarly, additional research is needed to test the vNRS-11 with different clinical samples experiencing both acute and chronic pain problems. If future studies corroborate our findings with children as young as 6 years old, the simplicity of the vNRS-11 might make it a very good choice for this age group. The simplicity of the assessment instrument is an important characteristic, one that would help to improve the rate of compliance with the measurement task.[13] Thus, for studies in which pain assessment is repeatedly required during the day, the vNRS-11 might be a good choice.

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