

Validation of a faces pain scale in postsurgical geriatric patients

Validación de una escala facial de dolor en pacientes geriátricos posquirúrgicos

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Abstract

Background: Geriatric patients present progressive difficult to assess pain. Getting a precise parameter to approach postsurgical pain is a very important issue. **Objective:** To explore Faces Pain Scale (EFD) validity in geriatric post-surgical patients. **Method:** Comparative, observational, prolective study in patients from a second level attention unit. Phase 1: faces were disorderly presented to ≥ 60 years old persons, Glasgow scale scored 15, signed authorization, to place them in ascending order. Phase 2: ≥ 60 years old patients, any sex, who received any surgical procedure, Glasgow scale scored 15, signed authorization were recruited. Those who did not cooperate/complete scales application were eliminated. Numeral Visual Scale (EVN) and 5 minutes after EFD were applied to each patient, before analgesia, and again 30 minutes after analgesia. Descriptive statistical data, effect-size, Student paired-t and Spearman tests were used. **Results:** Phase 1: every face was correctly placed (75-100%). Phase 2: 142 patients participated, 76 (53.5%) male, 66 (46.5%) female. Pre-analgesia media scores: EFDA 3.4, EVN 7.9; post-analgesia media scores: EFD 1.8, EVN 4.8. EFD effect-size test scored 2.389, paired-t scored 17.231 ($p < 0.002$); Spearman scores: 0.654 ($p = 0.016$) pre-analgesia, 0.798 ($p = 0.004$) post-analgesia. **Conclusion:** EFD is a valid scale to evaluate postoperative pain intensity in geriatric patients.

Keywords: Pain. EFD. Adult faces pain scale. Geriatrics. Validity.

Resumen

Antecedentes: Los pacientes geriátricos presentan dificultad progresiva para expresar el dolor. Es muy importante establecer un parámetro preciso para manejar el dolor posoperatorio. **Objetivo:** Determinar la validez de la escala facial del dolor (EFD) en pacientes geriátricos posquirúrgicos. **Método:** Estudio comparativo, observacional, prolectivo, en un hospital de segundo nivel de atención. Fase 1: se presentaron las caras de la escala desordenadas a personas ≥ 60 años, con Glasgow íntegro, previa firma de consentimiento, para ordenarlas ascendientemente. Fase 2: se incluyeron pacientes ≥ 60 años, de cualquier sexo, sometidos a cualquier procedimiento quirúrgico, con Glasgow íntegro, previa firma de consentimiento informado. Se eliminaron los que no cooperaron o no completaron ambas escalas. A cada paciente se aplicó, antes de recibir analgesia, la

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Date of reception: 14-02-2020

Date of acceptance: 28-04-2020

DOI: 10.24875/CIRUE.M20000251

Cir Cir (Eng). 2021;89(2):208-213

Contents available at PubMed

www.cirugiaycirujanos.com

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escala visual numérica (EVN), y 5 minutos después la EFD, y nuevamente 30 minutos tras la analgesia. Se utilizó estadística descriptiva, tamaño del efecto, *t* pareada y Spearman. **Resultados:** Fase 1: todas las caras fueron ubicadas correctamente (75-100%). Fase 2: participaron 142 pacientes, 76 (53.5%) hombres y 66 (46.5%) mujeres. Promedios preanalgesia: EFD 3.4, EVN 7.9; posanalgesia: EFD 1.8, EVN 4.8. Tamaño del efecto (EFD): 2.389; *t* pareada 17.231 ($p < 0.002$); Spearman 0.654 ($p = 0.016$) preanalgesia, 0.798 ($p = 0.004$) posanalgesia. **Conclusión:** La EFD es válida para evaluar la intensidad del dolor posoperatorio en pacientes geriátricos.

Palabras clave: Dolor. EFD. Escala facial del dolor. Geriatria. Validación.

Introduction

It is common for patients aged 60 years or older to experience progressive difficulty for expressing pain. The causes can be cognitive deterioration, speech impairment, changes in pain perception, sociocultural factors, or aversion to the term "pain". These causes may be related or not to concomitant diseases, which in turn influence with the pathology that causes pain in the strict sense. All of this originates a decreased ability to communicate sensations and needs¹⁻³.

The presence of pain should be recognized by interviewing and observing the subject, but, in geriatric patients, it can be a clinical challenge that is difficult to address. It can lead to misinterpretation of symptoms by medical personnel, which can be characterized as psychomotor agitation if pain is acute, or isolation, food rejection, and even stupor if pain is chronic^{1,2,4}.

In general, the incidence of pain is doubled when the 60-year barrier is crossed, with frequency increasing as each decade of life goes by⁵. For the care of the elderly surgical patient, it is highly important for a parameter to be established that allows us to be more accurate in the management of postoperative pain^{2,5,6}. Pain constitutes an essentially subjective and individual experience; however, older adults have difficulties for expressing it due to mild cognitive disorders (dyscalculia, dysphasia, dysarthria, etc.) or to socio-cultural preferences of this age group. In this population, the use of self-report scales is also preferred in order to make patient comprehensive management more objective and easy. Different scales have been used (facial scales, verbal descriptor scales, visual analogue and numeric scales, among the most commonly used), but there is still no consensus on their suitability and efficacy. However, there are also reports indicating the preference of older adults for scales that rely on facial expression¹⁻⁵.

In many countries, elderly population has increased; in Mexico, it accounts for almost 9% of the population

and is expected that by 2050 it will be more than 30%⁶. This makes for this issue to be of vital importance for health systems.

The present study proposes a faces pain scale (FPS)⁷ originally validated in children, who, for not having yet attained sufficient maturity, have decreased cognitive and language skills, coinciding in this aspect with the group of older adults. This scale has broadly demonstrated its validity and consistency, and it displays faces consistent with the Latin American population. It can be one more alternative for efficacious evaluation of post-surgical pain in patients older than 60 years.

The purpose of this study was to validate the FPS in post-surgical geriatric patients and compare it with the visual numeric scale (VNS).

Method

This work was approved by the Local Committee for Research and Health Research Ethics No. 2102 of the Mexican Institute of Social Security (IMSS – *Instituto Mexicano del Seguro Social*), with institutional registration number R-2013-2102-27. A comparative, observational, process study⁸ was carried out in patients from an IMSS secondary care hospital in the City of Puebla, Mexico. The study was divided in two phases.

Phase 1: FPS face and content validity

For face validity, graphic representations of round faces proposed in the FPS by García-Galicia et al.⁸ were used, for considering them pleasant and suitable for our context. They progressively illustrate people with and without pain, without a smile and crying at each end, respectively⁷.

For FPS content validity, different people aged 60 years or older, with Glasgow normal values, after signing the informed consent document, at waiting rooms of the hospital, were shown the individual faces

of the scale, randomly arranged, asking them to order them according to their perception of the degree of pain they represent, in ascending order.

Phase 2: FPS construct validity

Through convenient deterministic sampling, patients aged 60 years and older, cared for at the general surgery department hospitalization area, of either gender, undergoing any surgical procedure, with a Glasgow Coma Scale score of 15, and who granted informed consent were selected. Those who did not cooperate for the FPS to be applied, who requested to be withdrawn from the study or who did not complete the application of both scales were eliminated.

Each patient was evaluated by a researcher who applied the VNS⁹⁻¹¹, and 5 minutes later, the FPS⁸, prior to analgesic medication. The same researcher applied both scales again with the same technique 30 minutes after analgesia administration.

Statistical analysis

Descriptive statistics were used for content validity (positioning of faces in correct order), effect size and Student's paired t-test were used for sensitivity to change on each scale, and Spearman's correlation was resorted to for concurrent validity analysis (both aspects of construct validity).

Results

Phase 1: FPS face and content validity

Individual cards of the five-face scale were prepared, which were delivered to 77 individuals at specialty (internal medicine, cardiology, general surgery, and angiology) outpatient services waiting room. Distribution by age decades and gender of these subjects is shown in table 1.

As it can be observed in figure 1, faces 1 and 5 show the highest percentage of "correct order" (100-96%), while the one with the lowest is face 4 (88-76%). As for age groups, subjects aged 90 years and older have the lowest percentages of faces positioning, which was also influenced by the fact that only seven patients of this age group participated in this phase; however, their percentages of agreement are high (75-87.5%).

Table 1. Patient distribution by age and gender groups

Age (years)	Gender		Total
	F	M	
60-69	16	12	28
70-79	12	8	20
80-89	12	9	21
90 and older	3	5	8
Total	43	34	77

F: females; M: males.

Therefore, leaving the faces scale at its original five-face version was decided⁸. The counterpart was the widely-used numeric scale, represented by a numeric straight line from 0 to 10 (Fig. 2).

Phase 2: FPS construct validity

Of the 150 recruited patients aged between 60 and 93 years, eight were eliminated: two (one aged 70 and one aged 80) due to lack of cooperation for FPS to be applied (they refused to choose a face), and four due to serious early post-surgical complications (hypertensive crisis, wall hematoma during their stay in the recovery room, with reoperation being required) that interfered with application of the scales; two more patients required admission to the intensive care unit before the scales could be applied.

Thus, 142 patients did participate, out of whom 76 (53.5%) were males, and 66 (46.5%), females. The corresponding diagnoses in order of frequency are shown in table 2.

Figures 3 and 4 show the evaluations of both scales before and after analgesia, by gender, and total values. FPS was assigned scores ranging from 0 to 4 (on a discrete scale), only for statistical purposes.

For evaluation with FPS, pre-analgesia mode was 3 and, post-analgesia, 1. FPS sensitivity to change produced an effect size score of 2.389 for the patients. When the paired t-test was applied, the result was 17.231 ($p < 0.002$). When Spearman's test was applied, obtained values were 0.654 ($p = 0.016$) for pre-analgesia scores and 0.798 ($p = 0.004$) for post-analgesia scores.

Discussion

In this work, a FPS of robust validity⁷ (Fig. 2) was compared with VNS, an instrument of broad,

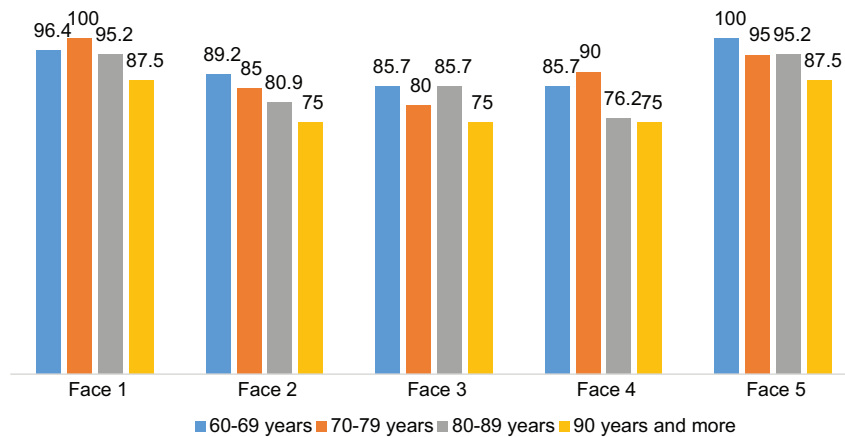


Figure 1. Percentages of faces correct positioning of by decade of age.

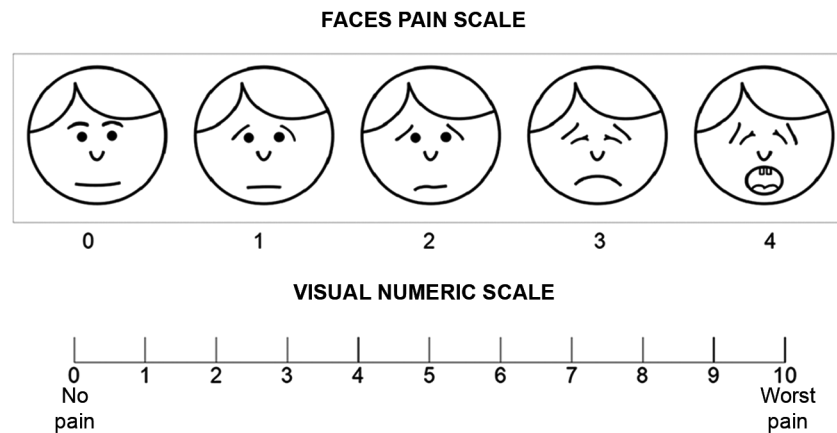


Figure 2. Faces pain scale (FPS) and visual numeric scale (VNS). The numbers on FPS were added for statistical purposes; they are not shown to the patient.

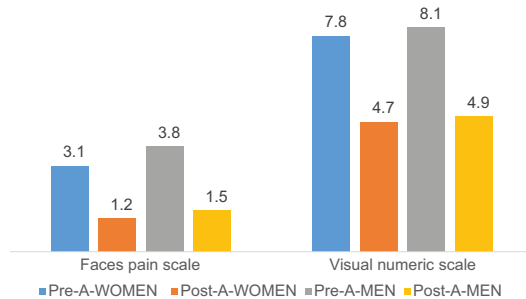


Figure 3. Comparison of the scales before and after analgesia, according to gender. Averages are shown. Pre-A: before analgesia; Post-A: after analgesia.

conventional and practical application, and well-documented validity, for evaluating post-surgical pain in subjects older than 60 years⁹⁻¹¹.

Pain evaluation in geriatric patients is of vital importance for their assessment and management, which must be considered by the family, health personnel and the health system itself^{1,5}.

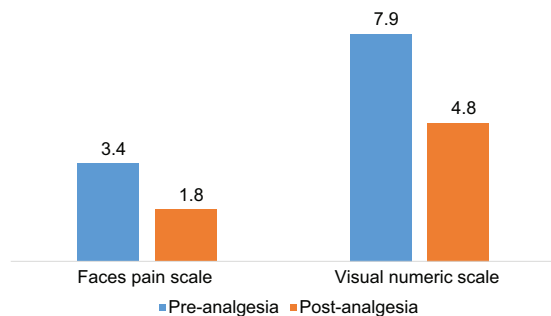
These patients have special physiological, cognitive, social, cultural and demographic characteristics, and represent a demographically growing population^{1,5,6}.

Pain reporting in geriatrics is influenced by factors such as attitudes and beliefs, previous painful experiences, cultural, religious and other differences, as well as by the belief that at older age it is "more normal to live with pain"^{5,12-16}. In addition, older adults require more tangible representations of pain involving less abstraction^{1,15-20}.

Available scales for evaluating pain are highly useful and efficacious in young adults, but somewhat distant,

Table 2. Diagnoses in order of frequency

Pathology	Total
Appendicitis	38
Chronic lithiasic cholecystitis	35
Exploratory laparotomy	21
Hernias (inguinal, wall and umbilical)	18
Peritoneal dialysis catheter insertion and removal	12
Colostomies and ileostomies	9
Biopsies and minor excisions (lipomas, sebaceous cysts, nevi)	8
Splenectomy	1

**Figure 4.** Comparison of the scales before and after analgesia. Total values.

cold and impractical for older adults^{11,12,19}. Self-report scales are the most valid and reliable for assessing pain intensity⁸⁻¹², even in patients with cognitive impairment¹²⁻¹⁷. Face scales suitability has already been reported as a valid, reliable and comparable or better alternative in comparison with other scales, such as numeric scales²⁰⁻²³. It has also been documented that older adults prefer face over numeric scales for evaluating pain^{18,20,23-26}.

From all this, the interest arose for carrying out the present work to explore the validity in geriatric patients of a FPS that previously demonstrated its high validity and excellent consistency for post-surgical pain in another special age group, such as pediatric patients. This scale dispenses with crying and smiling faces as the limits of the highest level of pain and absence of pain in order to avoid affecting the evaluation, as mentioned at its initial validation⁷.

In this work's phase 1, face and content validity of the scale was examined, replicating the procedure used in children, since both pediatric and geriatric

patients share difficulties for expressing pain. A solid agreement was found in the progressive ordering of the faces by the examined individuals (Fig. 1). In other words, the fact that most patients have correctly arranged the faces of the scale in progressive order demonstrates FPS robust content validity in the population aged 60 years and older.

Phase 2 examined FPS construct validity. A broad spectrum of surgeries was recorded, both minimally invasive and significantly bloody procedures, which infers high variability of evaluated pain. These data are consistent with the most common pathologies described in geriatrics^{24,25}. Only two patients refused to have the scales applied (in the case of the remaining four who were eliminated it was not due to instrument-related factors). Both facts strengthen FPS application validity (one component of the construct).

The recording of pain evaluations before and after analgesia shows the efficacy of treatment with both scales. The higher figures recorded in men appear to reinforce the statement that pain perception is affected by the environment and by the cognitive-affective nature of pain itself and patient himself, with women being who socio-culturally develop a higher pain threshold, although this remains controversial^{8,27,28} (Figs. 3 and 4). Sensitivity to change is also demonstrated, as illustrated by the effect size value and confirmed by the paired t-test figures, with a highly significant p-value. This confers high construct validity to the FPS in geriatric patients.

As it occurred with its validation in children⁸, there is better correlation of the FPS with the reference scale used as standard criterion (VNS) in post-analgesia pain evaluations than in those prior to analgesia. Either way, Spearman's test value for pre-analgesia measurements shows a moderate correlation, and post-analgesic measurements, a strong correlation, both highly significant. This convergent validity is also part of the construct validity, thus strengthening the FPS.

With FPS evaluation in immediate post-surgical patients and establishment of an early diagnosis with consequent administration of an appropriate analgesic regimen, care is optimized, patient self-esteem is fostered by not having pain in mind, and patient return to his/her activities is achieved, thus counteracting the feeling of dependence^{1,12,17}.

FPS administration seeks to promote applicator's warmth with the patient, since it favors affective communication, which at geriatric age is highly appreciated^{17,20,24-26}.

Conclusions

The results of this study allow to assert that the FPS has excellent construct and content validity, and concurrent validity with VNS. We can conclude that the FPS is a valid scale for the evaluation of postoperative pain intensity in geriatric patients.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this research.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

Conflicts of interest

The authors did not receive any support or funding for the present work. The authors declare that there are no conflicts of interest.

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