**Suppl Table 6. Psychometric Scores for Pain Assessment Tools**

|  |  |  |  |
| --- | --- | --- | --- |
| **Q #** | **Question** | **Scoring Legend** | **Score** |
| **BPS** | **BPS-NI** | **CPOT** | **FLACC** | **NPAT** | **\*NVPS** | **PAIN** | **BOT** | **Faces Scale** | **FACS** | **PAINAD** | **BPAT** |
|  | **Scale Development: Item Selection and Content Validation** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.1 | Was the process of item selection described? | 2: Scale was developed for a specific population, using a theoretical or conceptual framework, or a qualitative approach was used (e.g. consultation with clinicians or patients)1: Scale was developed based on the literature review only0: No information is provided about item selection | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| 1.2 | Was content evaluated by experts? (content validation) | 2: Content was evaluated by experts in the field, a Delphi technique may have been used, and Content Validity Index (CVI) were calculated for each item included in the scale1: Content was evaluated by experts, but no CVI is reported0: No information is provided about content validation | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 1.3 | Are limitations of some items presented or discussed? | 1: No limitations or if any limitations, they are presented and item modifications have been made or precautions have been stated 0: No information is provided | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| Subtotal - Scale development (0-5) | 3 | 2 | 5 | 3 | 3 | 3 | 3 | 4 | 1 | 2 | 3 | 4 |
| Subtotal weighted score - Scale development (0-2) | 1.2 | 0.8 | 2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.6 | 0.4 | 0.8 | 1.2 | 1.6 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q #** | **Question** | **Scoring Legend** | **Score** |
| **BPS** | **BPS-NI** | **CPOT** | **FLACC**  | **NPAT** | **\*NVPS** | **PAIN** | **BOT** | **Faces Scale** | **FACS** | **PAINAD** | **BPAT** |
|   | **Scale Testing - Reliability** |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 2.1 | Was internal consistency of the scale calculated? | 2: 0.70<alpha<0.901: 0.60<apha<0.70 or alpha>0.90 0: alpha<0.60 or no information provided | 2 | 2 | 2 | 2  | 2 | I=2R=2 | 0 | 0 | N/A | 0 | 2 | 0 |
| 2.2 | Was interrater reliability calculated? | 2: kappa>0.60 or ICC>0.80 1: 0.60<kappa>0.40 or 0.60<ICC<0.80 0: kappa<0.40, ICC<0.60 or no information provided | 2 | 2 | 2 | 2 | 1 | I=2R=1 | 0 | 0 | 0 | 2 | 0 | 1 |
| 2.3 | Was interrater reliability tested with other raters besides research team? | 1: Other raters then research staff members were involved 0: Only research staff members were involved | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 2.4 | Was intrarater reliability tested? Optional-to be examined if kappa<0.60 or ICC<0.80 for interrater reliability | 2: kappa>0.60 or ICC>0.80 1: 0.60<kappa>0.40 or 0.60<ICC<0.80 0: kappa<0.40, ICC<0.60 or no information provided | 0 | N/A | 0 | N/A | 0 | I=N/AR=0 | 0 | 0 | 0 | N/A | 0 | N/A |
| Subtotal - Scale development (0-5 or 0-7 if intrarater reliability testing required) | 5/7 | 5/5 | 5/7 | 5/5 | 4/7 | I=5/5R=4/7 | 1/7 | 1/7 | 1/7 | 2/5 | 3/7 | 2/5 |
| Subtotal weighted score - Scale development (0-6) | 4.3 | 6 | 4.3 | 6 | 3.4 | I=6R=3.4 | 0.9 | 0.9 | 0.9 | 2.4 | 2.6 | 2.4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q #** | **Question** | **Scoring Legend** | **Score** |
| **BPS** | **BPS-NI** | **CPOT** | **FLACC**  | **NPAT** | **\*NVPS** | **PAIN** | **BOT** | **Faces Scale** | **FACS** | **PAINAD** | **BPAT** |
|   | **Scale Testing: Construct Validity** |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 3.1 | What is the total of participants for the purpose of testing the scale? | 2: N>501: 20<N<500: N<20 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 3.2 | Criterion validation: Was the scale correlated with the “gold standard” measure renown in the field of interest (e.g. the patient’s self-report of pain)? | 2: r>0.60 with the “gold standard” measure 1: 0.40<r<0.60 0: r<0.40 or no information provided | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 |
| 3.3 | Criterion validation: Was the sensitivity of the scale calculated? | 2: Sensitivity > or = 80% 1: 60% < or = Sensitivity<80% 0: Sensitivity<60% or no information provided | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3.4 | Criterion validation: Was the specificity of the scale calculated? | 2: Specificity > or = 80% 1: 60% < or = Specificity < 80% 0: Specificity < 60% or no information provided | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3.5 | Discriminant validation: Was the scale able to discriminate between different situations, e.g. between pain and no pain (e.g. at rest and during a nociceptive procedure, before and after the administration of an analgesic)? | 2: A clinically important difference was found1: A difference was found but was not considered clinically important0: No difference was found or no information is provided | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 |
| Subtotal - Scale development (0-10) | 7 | 5 | 8 | 3 | 2 | 4 | 1 | 5 | 4 | 4 | 2 | 7 |
| Subtotal weighted score - Scale development (0-8) | 5.6 | 4 | 6.4 | 2.4 | 1.6 | 3.2 | 0.8 | 4 | 3.2 | 3.2 | 1.6 | 5.6 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q #** | **Question** | **Scoring Legend** | **Score** |
| **BPS** | **BPS-NI** | **CPOT** | **FLACC** | **NPAT** | **\*NVPS** | **PAIN** | **BOT** | **Faces Scale** | **FACS** | **PAINAD** | **BPAT** |
|   | **Scale Feasibility** |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 4.1 | Was the feasibility (i.e. ease of usage with which clinicians can apply the instrument in the clinical setting) of the scale examined? | 1: Scale is considered to be feasible to use by more than 80% of the clinicians0: Scale is considered to be complex to use by more than 20% of the clinicians or no information is provided information is provided | 1 | 1 | 1 | 0 | 0 | I=0R=1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.2 | Are directives of use of the scale clearly described? | 1: Yes, directives of use including the scoring method are described 0: No information about directives of use is provided | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| Subtotal - Scale development (0-2) | 2 | 2 | 2 | 0 | 1 | I=0R=2 | 1 | 1 | 0 | 1 | 1 | 1 |
| Subtotal weighted score - Scale development (0-2) | 2 | 2 | 2 | 0 | 1 | I=0R=2 | 1 | 1 | 0 | 1 | 1 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q #** | **Question** | **Scoring Legend** | **Score** |
| **BPS** | **BPS-NI** | **CPOT** | **FLACC** | **NPAT** | **\*NVPS** | **PAIN** | **BOT** | **Faces Scale** | **FACS** | **PAINAD** | **BPAT** |
|   | **Scale Relevance or Impact of Implementation in ICU patient outcomes** |   |   |   |   |   |   |   |   |   |  |  |  |  |
| 5.1 | Was the relevance of the scale or impact of its implementation in ICU patient outcomes examined? | 1: Scale is considered to be useful and relevant to practice by more than 80% of the clinicians; use of the scale yielded a significant change into practice (e.g. better use of medication, increase in patients’ assessments) 0: Scale is not considered to be useful and relevant to practice by more than 20% of the clinicians; use of the scale did not yield to a significant change into practice or no information provided | 1 | 1 | 1 | 0 | 0 | I=1R=0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Subtotal - Scale development (0-1) | 1 | 1 | 1 | 0 | 0 | I=1R=0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Subtotal weighted score - Scale development (0-2) | 2 | 2 | 2 | 0 | 0 | I=2R=0 | 2 | 0 | 0 | 0 | 0 | 0 |
| **Total Score (0-25)** | **18** | **15** | **21** | **11** | **10** | **I=13/23****R=13/25** | **7** | **11** | **6** | **9** | **9** | **14** |
| **Weighted Score (0-20)** | **15.1** | **14.8** | **16.7** | **9.6** | **7.2** | **I=12.4****R=9.8** | **5.9** | **7.5** | **4.5** | **7.4** | **6.4** | **10.6** |
| **Quality of Evidence** | M | M | M | VL | L | L | VL | L | VL | L | L | M |
| \*NVPS has two versions: initial (I), and revised (R) |  |  |  |  |  |  |  |  |  |  |  |  |
| BPS = Behavioral Pain Scale; BPS-NI = Behavioral Pain Scale – Non-Intubated; CPOT = Critical-Care Pain Observation Tool; FLACC = Face Legs Activity Cry Consolability; NPAT = Nonverbal Pain Assessment Tool; NVPS = NonVerbal Pain Scale; PAIN = Pain Assessment and Intervention Notation; BOT = Behavior Observation Tool;FACS = Facial Action Coding System; PAINAD = Pain in Advanced Dementia; BPAT = Behavior Pain Assessment Tool |  |  |  |  |  |  |