

Improving the clinical usefulness of a behavioural pain scale for older people with dementia

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Abstract

Title. Improving the clinical usefulness of a behavioural pain scale for older people with dementia

Aim. This paper is a description of the process of item reduction as part of the construction of the Pain Assessment Checklist for Seniors with Limited Ability to Communicate to assess pain in Dutch older nursing home residents with dementia.
Background. A valid and reliable clinically useful tool is important for assessing pain in people with dementia. The Pain Assessment Checklist for Seniors with Limited Ability to Communicate has demonstrated good inter- and intra-rater reliability and evidence of construct validity. However, nurses found the scale too long for clinical use.

Methods. In an observational study in 2005, nursing home patients ($n = 128$) were observed while receiving an influenza injection, and a selection of patients were also assessed at a patient-specific pain moment. Internal consistency and Principal Component Analysis were used to refine the scale, to examine the psychometric quality and underlying factor structure of the scale.

Results. A brief and manageable version of the Pain Assessment Checklist for Seniors with Limited Ability to Communicate in Dutch was developed, with a three-component solution including 24 items. This version had high levels of internal consistency for the complete scale (Cronbach's alpha range 0.82–0.86) and for all subscales (alpha range 0.72–0.82). Social-emotional items played a significant role in detecting pain.

Conclusion. It is important to have a valid, reliable, brief and manageable pain scale available for the nursing home setting. Further research is needed to examine the adequacy and effectiveness of the scale in daily clinical practice.

Keywords: dementia, instrument validation, nursing assessment, nursing homes, older people, Pain Assessment Checklist for Seniors with Limited Ability to Communicate in Dutch, pain

Introduction

Pain assessment in older patients has been recognized as a subject of major importance (AGS 1998), and adequate assessment is the first crucial step towards adequate treatment. Under-treated pain can cause numerous additional health and behavioural problems, such as agitation, sleep disturbance, weight loss and depression (Warden *et al.* 2003). However, assessing pain accurately remains an extremely difficult daily challenge for nurses. Limited ability or inability to communicate orally is one of the difficulties in assessing pain in nursing home patients with severe dementia. Furthermore, there is no such thing as a typical patient with dementia: dementia is a syndrome characterized by progressive decline in cortical functions (Farrell *et al.* 1996) with great variability in pain responses and behavioural repertoires due to, for example, different causes and different degrees of severity of the syndrome. In addition, the process of ageing and the dementia itself are associated with increasing somatic and psychological problems, limiting the ability of older patients to express their pain. These aspects may also add to the complexity of pain and its assessment.

All constructors of pain scales aimed at developing a scale, which is psychometrically sound and clinically useful. While collecting the items is the easy part, it is much more difficult to establish a valid, reliable scale that is sensitive to changes and specific, but not too specific to assess pain. Although interest in pain assessment in older persons with dementia has grown considerably in the last decade, two recent reviews on pain assessment tools show that the pain scales currently available for this population are still in the early stages of construction, development and testing, and show moderate psychometric qualities (Herr *et al.* 2006; Zwakhalen *et al.* 2006a). Also, even if excellent psychometric qualities have been established, a scale is of no use if it is not easy to use in clinical practice. This implies that a scale has to be brief, easy to administer and not too time-consuming.

The Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC), developed by Fuchs-Lacelle and Hadjistavropoulos (2004), one of the best-performing scales is currently available for assessing pain in nursing home residents (Zwakhalen *et al.* 2006a). The PACSLAC is a dichotomously-scored checklist which includes 60 items, originally covering four sub-scales: Facial expression (13 items); Activity/Body movements (20 items); Social/Personality/Mood (12 items) and Physiological/Eating/Sleeping/Vocal (15 items). The authors of the scale have reported good internal consistency for the total

scale ($\alpha = 0.82-0.92$), although the Cronbach's α values for the subscales were lower ($0.55-0.73$). The PACSLAC seems to discriminate between painful, calm and distressing events (Fuchs-Lacelle & Hadjistavropoulos 2004).

As the scale has not been extensively tested beyond the initial study setting and population, we have conducted a study to compare the psychometric qualities of three pain assessment scales for older people with dementia (Zwakhalen *et al.* 2006b). Findings of this recent study showed that the Dutch version of the PACSLAC has good inter-rater (range $0.77-0.96$) and intra-rater reliability (range $0.72-0.92$) and shows evidence of construct validity (discriminating between pain and no-pain events). Cronbach's alpha for the total scale was high (>0.80), and was adequate for the 'Facial Expression' (range $0.57-0.73$) and 'Social/Personality/Mood' (range $0.65-0.76$) subscales. Cronbach's alpha was lower than the desired 0.7 for two subscales, viz. 'Activity/Body movement' ($\alpha = 0.40-0.57$) and 'Physiological indicators/Eating/Sleeping changes/Vocal behaviours' ($\alpha = 0.20-0.43$). Several items showed no variance at all. Information we gathered on clinical usefulness showed that nurses preferred the potentially clinically-relevant PACSLAC for pain assessment in this population, although they found that the Dutch version of the scale had too many items. Qualitative information gathered from the participating nurses showed that several items seemed superfluous and other items overlapped (Zwakhalen *et al.* 2006b). The question in the present study was therefore whether the number of items in the Dutch version of the PACSLAC scale (PACSLAC-D) could be reduced, while retaining good psychometric qualities.

The study

Aims

The aim of the study was to carry out item reduction as part of the construction of a translated version of the PACSLAC scale to assess pain in Dutch older nursing home residents with dementia. More specifically, the following research questions were addressed:

- What PACSLAC items represent the pain cues most frequently used when assessing pain in nursing home residents with dementia?
- What is the scale structure of the reduced version of the PACSLAC (PACSLAC-D), established by principal component factor analysis?
- Are the reduced version of the PACSLAC (PACSLAC-D) and its subscales internally consistent?

Design

Data were collected in an observational study design in 2005. All patients were observed while receiving an influenza vaccination, and a selection of patients were also observed at a patient-specific pain moment (e.g. care activities, washing or mobilization).

Participants

One hundred and twenty-eight nursing home patients on 12 dementia care wards receiving their annual planned influenza vaccination were included in this study. To be included, older residents with dementia had to have been living in the nursing home for at least 4 weeks prior to the influenza vaccination. All residents were at least 60 years old and had not undergone major environmental changes in the last month. The type of dementia syndrome and severity of the impairment varied. Those with psychiatric disease or with Korsakov's syndrome were excluded because these people generally differ from other residents with dementia (e.g. are younger and have better mobility) and live in special Korsakov or psychiatric wards in the nursing homes.

Data collection

Measures

Data used to refine the translated version of the PACSLAC were gathered as part of a larger study testing the psychometric qualities of three pain assessment scales and their clinical utility.

Demographic information (age, sex, dementia diagnosis and severity of cognitive impairment) was gathered from all participants and recorded on a data sheet. The Minimum Data Set (MDS) Cognitive Performance Scale (CPS; Morris *et al.* 1994) was also used to evaluate the cognitive status (severity of cognitive impairment) of the residents. The CPS combines five MDS items relating to cognitive functioning, eventually yielding seven categories of cognitive impairment (Hartmaier *et al.* 1995). The MDS-CPS has been validated against the Mini-Mental State Examination (MMSE; Folstein *et al.* 1975) and showed substantial agreement (Hartmaier *et al.* 1995).

Information about the environmental changes during the last month and the type of dementia diagnosed was obtained from patient records. Pain was assessed using the translated (Dutch) version of the PACSLAC, originally developed by Fuchs-Lacelle and Hadjistavropoulos (2004). The scale had been translated during an earlier stage using a backward-forward method, and had been pre-tested before

its psychometric qualities were assessed (Zwakhalen *et al.* 2006b). Furthermore, a Visual Analogue Scale-observer (VAS) was used to estimate pain intensity. A VAS is a 100-mm line, with anchors at either end, on which pain can be marked. The left hand-side anchor was labelled 'no pain at all' and the right hand-side anchor was labelled 'pain as bad as it could possibly be' (Jensen & Karoly 2001). VAS pain ratings ≥ 30 were considered to represent pain. This cut-off score is frequently used in pain studies (e.g. Collins *et al.* 1997) and in studies involving cognitively impaired patients (e.g. Breau *et al.* 2002).

Procedure

The influenza vaccination was planned simultaneously for all patients in one ward and scheduled to take place on the same day. After baseline measurement and demographic information gathering, patients' pain response was observed for approximately 2 minutes during vaccination (T2). The observer had no prior in-depth knowledge of the nursing home residents. A selected group was also assessed during a specific moment/situation (T3). At T3, patients underwent a variety of specific potentially painful interventions (such as care activities, washing or mobilization). Those who, in the opinion of the nurses involved, were not expected to be in pain at specific moments were not assessed a third time. After the T3 observational moment, the VAS and PACSLAC were scored again by the same observer.

At baseline, T2 and T3, the VAS-observer and the PACSLAC were scored in random order immediately after the patient had been observed. To avoid differences in scores due to developments over time, the time interval between T2 and T3 was minimized and was mostly shorter than 3 weeks.

Ethical considerations

The study was approved by the Medical Ethics Committee of the University Hospital Maastricht and the University of Maastricht. Permission to conduct the study was also obtained from the managing directors of the nursing homes. Before participation, registered legal guardians of the residents gave written informed consent.

Data analysis

All data were analysed using SPSS. Descriptive statistics were generated for the characteristics of respondents. Frequency of endorsement ratings were computed using descriptive statistics to examine the frequency of items used. The item reduction process started with internal consistency (IC) analyses for the total scale. Items were discarded if they

were used in over 90% of recordings or not used in over 90% recordings at T2 and T3 or if the item-total correlation was lower than 0.20. Because of the exploratory character of the study, the factor structure was assessed after the IC analyses, using principal component analysis (PCA). Because T2 yielded the most data, PCA analyses were carried out for T2. An Oblimin rotation was used, allowing components to correlate. Kaiser–Meyer–Olkin (KMO) was used to check if the PCA technique was allowed. Eigenvalues and a scree plot were used to determine the number of components to extract. Items were removed if the measure of sampling adequacy (MSA, KMO for individual items) was below 0.5. After an item had been deleted, the data were re-examined, computing a new anti-image matrix. Items were also deleted if communalities were low (<0.5) or had no substantial factor loading (below 0.4 given the number of respondents). Finally, the ICs of the final scale and subscales were re-examined using Cronbach's alpha.

Results

Participants

A total of 128 nursing home residents with dementia participated in this study, including 78.1% women ($n = 100$) and 21.9% men ($n = 28$). Ages ranged from 60 to 96 years, with a mean of 82.4 (SD = 6.8). All participants were residents on dementia care wards. Almost half of the participants ($n = 61$, 47.7%) were severely impaired (MDS-CPS = 5 or 6), 28.1% ($n = 36$) were moderately impaired and a minority were mildly impaired ($n = 28$, 21.9%). The dementia diagnosis was Alzheimer's disease in 32%, vascular dementia in 18.8%, other in 9.4% and unknown in 39.8%.

Most frequently used pain cues

Table 1 presents the item usage, assessed by calculating the frequency with which the rater endorsed PACSLAC items when assessing participants (using the VAS-observer ≥ 30) at T2 and T3.

Item reduction

Based on the 90% criteria or low IC scores, 31 items were discarded. Before running the final analyses, exploratory analyses were used to screen the data and explore KMO values and MSA values. The KMO value for the 29 items scale was 0.66. Four items (clenching teeth, stiff/rigid, angry/mad, clenched fist) were discarded based on the fact that the MSA values were too low (i.e. below 0.50).

Table 1 Most frequently used items of PACSLAC (VAS ≥ 30)

Items	T2 ($n = 127$) [†] , % scored by rater 1	T3 ($n = 35$), % scored by rater 1
Tighter face	96.4	100
Change in eyes*	96.4	78.3
Pain expression	82.1	69.6
Frowning	75	78.3
Creasing forehead*	75	65.2
Specific sound or vocalization for pain	71.4	65.2
Grimacing	46.4	69.6
Moaning and groaning	46.4	69.6
Pulling away	46.4	47.8
Opening mouth*	42.9	43.5
Mumbling*	32.1	17.4
Not wanting to be touched	28.6	43.5
Upset	28.6	21.7
Restless	25	30.4
Flushed/red face	25	21.7
Flinching	25	4.3
Anxious	21.4	39.1
Clenching teeth	17.9	43.5
Mean VAS scores (rater 1) min. 0–max. 100	17.1 (0–85)	36.3 (0–83)

*Also frequently present ($>15\%$) during a non-painful situation (VAS = 0).

[†] $n = 127$ because one patient's M2 moment was missing.

PACSLAC, Pain Assessment Checklist for Seniors with Limited Ability to Communicate; VAS, Visual Analogue Scale

Removing these 4 items clearly increased the KMO value, to 0.74. A value close to one indicates that patterns of correlations are relatively compact and so factor analyses should yield distinct and reliable factors (Field 2005). Field (2005) reported that Kaiser recommends a bare minimum of 0.5. Communalities of all remaining 25 items were >0.5 . The eigenvalues and scree plot were then examined to determine the number of components. Using Kaiser's criterion, as referred to by Field (2005), only factors with an eigenvalue >1 should be extracted. Based on the eigenvalues, we should have extracted eight components. However, this criterion is not accurate for the data in this study, as the sample size was small relative to the number of variables. Plotting the eigenvalues allowed us to detect where the decrease in eigenvalues appeared. According to the scree plot, three components remain, all with an eigenvalue above two. Finally, the 'opening mouth' item was removed because it had a factor loading below 0.4, which had been set as the minimum. Table 2 presents an overview of the items discarded in this reduction process.

Table 2 Overview of item reduction

Discarded items	Step 1*, reduction of $n = 31$ items	Step 2†, reduction of $n = 4$ items	Step 3‡, reduction of $n = 1$ item
Tighter face	x		
Dirty look	x		
Wincing	x		
Screwing up nose	x		
Fidgeting	x		
Pacing	x		
Wandering	x		
Trying to leave	x		
Refusing to move	x		
Thrashing	x		
Decreased activity	x		
Refusing medications	x		
Moving slow	x		
Impulsive behaviour	x		
Limping	x		
Going into foetal position	x		
Throwing things	x		
Increased confusion	x		
Anxious	x		
Frustrated	x		
Pale face	x		
Teary eyed	x		
Sweating	x		
Shaking/trembling	x		
Cold & clammy	x		
Change in sleep	x		
Change in appetite	x		
Calling out	x		
Crying	x		
Mumbling	x		
Grunting	x		
Clenching teeth		x	
Stiff/rigid		x	
Angry/mad		x	
Clenched fist		x	
Opening mouth			x

*Removed based on 90% criteria.

†Removed based on low MSA values < 0.50 .

‡Removed based on low factor loadings < 0.40 .

Factor structure and IC of the refined scale

Final analyses showed that three components explained 45.7% of the variance. The first component explained 27.3%, the second component 9.3% and the third component 9.1% of the variance. Table 3 shows the refined version of the PACSLAC, with loadings of the 24 items on the three factors extracted.

Re-examination of the IC scores showed that the alpha for the total scale with 24 items was 0.86 at T2 and 0.82 at T3. The Cronbach's alpha values for the three subscales were high, ranging from 0.72 to 0.82 (See Table 3). Finally, the

reduced version of the scale was correlated with the long 60-item version of the scale, resulting in a Pearson's correlation coefficient of 0.945. This confirmed that the refinement of the scale did not devalue the findings.

Discussion

A brief and manageable version of the PACSLAC-D was developed, with a three-component solution including 24 items. Our findings demonstrate that the scale has high levels of internal consistency for the complete scale (Cronbach's alpha range 0.82–0.86) and for all subscales (alpha range

Variables	Component 1 (<i>n</i> = 10 items)	Component 2 (<i>n</i> = 6 items)	Component 3 (<i>n</i> = 8 items)
Pain expression	0.77		
Specific sound or vocalization for pain	0.73		
Frowning	0.68		
Grimacing	0.63		
Creasing forehead	0.60		
Moaning and groaning	0.60	-0.32	
Change in eyes	0.52		
Touching/holding sore area	0.46		
Guarding sore area	0.45		
Pulling away*	0.39	-0.31	
Verbal aggression	0.53	-0.41	
Agitated		-0.68	0.60
Physical aggression		-0.68	
Flinching		-0.61	
Not wanting to be touched		-0.59	0.39
Uncooperative/resistant to care		-0.56	0.56
Cranky/irritable			0.63
Screaming/yelling			0.60
Grim face			0.59
Not allowing people near			0.56
Upset	0.33		0.54
Flushed/red face			0.50
Restless			0.49
Sad look			0.45
Cronbach's alpha	0.82	0.78	0.72

Table 3 Results of the Principal Components Analysis (PCA) and final Internal Consistency scores of the subscales determined by the PCA

Rotation Method: Oblimin with Kaiser Normalization. All loadings <0.30 are suppressed.

*This item is included although the factor loading was marginally below 0.40.

Items loading one more than one component are also shown in bold.

PACSLAC, Pain Assessment Checklist for Seniors with Limited Ability to Communicate.

0.72–0.82). These findings meet the criteria that Cronbach's alpha for newly-developed scales should be above 0.70 (Nunnally 1978). Fuchs-Lacelle and Hadjistavropoulos (2004) reported similar IC scores for the original total 60-item scale, while IC scores for subscales ranged from 0.55 to 0.73.

Herr *et al.* (2006) concluded in their review that PACSLAC is potentially useful and appears to be simple to use. However, they recommended that the tool should be prospectively evaluated with a larger sample, including factor analysis, in order to establish reliability and validity. In the present study we addressed both of these aspects. The results of the PCA show that the three factors explaining the underlying factor structure related to facial and vocal expressions, resistance/defence and social-emotional aspects/mood. A closer look at the remaining 24 items (see Appendix A for the final refined version of the PACSLAC-D) shows that many items refer to social-emotional aspects. Behavioural symptoms referring to, for example, mood, aggression and agitation obviously play an important role in

detecting pain. While facial expressions seem to be more universal pain cues, occurring in all pain scales for various target groups, these social-emotional cues seem more specific and important for older people with dementia. It is very important for nurses and other healthcare workers to link these social-emotional behavioural cues to possible painful conditions. As the refined version of the scale contains so many social-emotional behaviour items, another future challenge is the problem of 'behavioural and psychological symptoms of dementia' (BPSDs) in relation to pain. As little is so far known about the interaction between pain symptoms and these behavioural problems, the relationship between pain and BPSDs needs to be explored.

As almost all frequently used items were retained in the final scale, these are the most probable and solid pain cues in determining pain, especially procedural pain, in older people with dementia. Two of the most frequently used items that were not included in the final scale were 'opening mouth' and 'mumbling'. These are the two items that were also frequently reported at rest and in non-painful situations. Although an

What is already known about this topic

- Assessing pain is crucial, as inadequate assessment could mean that pain remains under-detected and under-treated, with negative effects on quality of life.
- Further psychometric evaluation of existing scales to measure pain in people with dementia should be given priority over developing new scales.
- The Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC) demonstrates good validity and reliability, although it could be refined to reduce the number of scale items and increase the homogeneity of the scale and subscales.

What this paper adds

- A psychometrically sound, brief and manageable version of the PACSLAC-D with a three-component solution including 24 items.
- Behavioural symptoms referring to, e.g. mood, aggression and agitation play a statistically significant important role in detecting pain.
- This valid, practical and reliable scale can help to improve pain treatment for older people with dementia.

Oblimin rotation was justified, we also used a Varimax rotation to check the cluster solution. Varimax rotation resulted in a comparable solution, with overall lower factor loadings.

Study limitations

Our study, which had a mainly methodological focus, was subject to certain limitations. Given the number of items in the PACSLAC-D and using the rule of thumb of 5–10 participants for each item, the sample size of 128 participants was small, particularly given the fact that a minority had moderate or severe pain. Another methodological limitation relates to the data collected to reduce the scale. It must be kept in mind that the items collected for this purpose may be influenced by the type of pain focused on in collecting the items. Items were deleted if they were not present or always present (in over 90%, i.e. showing almost no variance) at the M2 and M3 observational moments. Whereas acute injection pain was measured at M2, a broader variety of procedural pain during morning care was measured at M3. However, it is possible that if other moments of pain had been used, other items might have been more frequently used. This limitation should be seen in relation to ongoing developments and

should also be viewed as a suggestion for future research. It will be of great interest for future studies to determine the validity and reliability of the PACSLAC-D in other types of more chronic pain and to see whether the use of the longer 60-item PACSLAC set reveals other pain behaviours to be frequently used.

Furthermore, the criteria used to reduce the number of items may also have influenced our findings. To examine and remediate this possible problem, additional analyses were performed using a different approach to reduce the number of items. Instead of using the 90% criterion and item-total correlations, items were deleted until the alpha stopped increasing. This approach resulted in mostly the same items being retained. Differences related to items which were not frequently used, such as ‘grunting’ (used by 0% of respondents at T2 to 4.3% at T3) and ‘crying’ (used by 3.6% of respondents at T2 to 0% at T3).

Another concern might be the fact that only one rater made the observations (VAS and PACSLAC) and allocated the scores that were used to perform the PCA and reduce the number of scale items. This observer was the consistent factor in the rating of all patients. It might be questioned whether this has biased the results. As mentioned above, the data for this study were gathered as part of a larger study testing the psychometric qualities of three pain assessment scales and their clinical utility (Zwakhalen *et al.* 2006b). This larger study used different raters to score the PACSLAC, and used a VRS self-report to rate the pain if possible. Based on the high levels of interrater reliability ($r = 0.77-0.96$) and the high correlation with the VRS ($r = 0.86$) at the selected pain moments (T2 and T3 VAS ≥ 30), we conclude that this approach is reliable. It is important to have a valid, reliable, brief and manageable pain scale available for nursing home settings. Our future plans include examination of the adequacy and effectiveness of the scale in daily clinical practice.

Conclusion

The availability of a clinically useful tool has major implications for nursing practice and direct patient care. Objective assessment provides information about possible pain experienced by patients and therefore decreases the risk of undertreatment. It also gives opportunities to generate new data to add to the body of knowledge. For example, because of the absence of adequate measurement scales, estimated pain prevalence rates have varied between 40% and 80%, and we do not know exactly how many older people with severe dementia experience pain on a daily basis. The availability of validated behavioural pain scales gives us

with the opportunity to assess prevalence rates more precisely.

Finally, standardized pain scoring should be introduced in nursing care protocols and nurses should see it as part of their task to assess pain, record it and apply interventions if necessary. This will undoubtedly lead to better pain assessment and treatment, which is in the best interests of older patients with dementia.

Author contributions

SZ, MB and JH were responsible for the study conception and design and SZ was responsible for the drafting of the manuscript. SZ, MB and JH performed the data collection and data analysis. MB and JH obtained funding and provided administrative support. MB and JH made critical revisions to the paper. SZ and MB provided statistical expertise. MB and JH supervised the study.

References

- American Geriatrics Society (1998) The management of chronic pain in older persons: AGS Panel on Chronic Pain in Older Persons. *Journal of the American Geriatrics Society* 46(5), 635–651.
- Breau L.M., Finley G.A., McGrath P.J. & Camfield C.S. (2002) Validation of the non-communicating children's pain checklist-postoperative version. *Anesthesiology* 96(3), 528–535.
- Collins S.L., Moore R.A. & McQuay H.J. (1997) The visual analogue pain intensity scale: what is moderate pain in millimetres? *Pain* 72(1–2), 95–97.
- Farrell M.J., Katz B. & Helme R.D. (1996) The impact of dementia on the pain experience. *Pain* 67, 7–15.
- Field A. (2005) *Discovering Statistics Using SPSS*. SAGE publications, London.
- Folstein M.F., Folstein S.E. & McHugh P.R. (1975) 'Mini-mental state'. A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research* 12, 189–198.
- Fuchs-Lacelle S. & Hadjistavropoulos T. (2004) Development and preliminary validation of the pain assessment checklist for seniors with limited ability to communicate (PACSLAC). *Pain Management Nursing* 5(1), 37–49.
- Hartmaier S.L., Sloane P.D., Guess H.A., Koch G.G., Mitchell C.M. & Phillips C.D. (1995) Validation of the minimum data set cognitive performance scale: agreement with the mini-mental state examination. *Journal of Gerontology* 50A(2), M128–M133.
- Herr K., Bjoro K. & Decker K. (2006) Tools for assessment of pain in nonverbal older adults with dementia: a state-of-the-science review. *Journal of Pain and Symptom Management* 31(2), 170–192.
- Jensen M.P. & Karoly P. (2001) Self-report scales and procedures for assessing pain in adults. In *Handbook of Pain Assessment* 2nd edn., (D.C.Turk & R.Melzack, eds), The Guilford Press, New York, London, pp. 14–34.
- Morris J.N., Fries B.E., Mehr D.R., Hawes C., Phillips C., Mor V. & Lipsitz L.A. (1994) MDS Cognitive Performance Scale. *Journal of Gerontology* 49(4), M174–M182.
- Nunnally J.C. Jr (1978) *Psychometric Theory*. McGraw-Hill, New York.
- Warden V., Hurley A.C. & Volicer L. (2003) Development and psychometric evaluation of the Pain Assessment in Advanced Dementia (PAINAD) scale. *Journal of the American Medical Directors Association* 4(1), 9–15.
- Zwakhalen S.M., Hamers J.P., Abu-Saad H.H. & Berger M.P. (2006a) Pain in elderly people with severe dementia: a systematic review of behavioural pain assessment tools. *BMC Geriatrics* 6, 3.
- Zwakhalen S.M., Hamers J.P. & Berger M.P. (2006b) The psychometric quality and clinical usefulness of three pain assessment tools for elderly people with dementia. *Pain* 126, 210–220.

Appendix A

PACSLAC-D, refined shortened version

Date: _____ Time assessed: _____

Name of patient/resident: _____

Purpose:

This checklist is used to assess pain in patients/residents who have dementia and limited ability to communicate.

Instructions:

Indicate with a checkmark, which of the items on the PACSLAC occurred during the period of interest. Scoring the sub-scales is derived by counting the checkmarks in each column. To generate a total pain score sum all sub-scale totals

Comments:

Facial and vocal expressions	Present
Pain expression	
A specific sound or vocalization for pain 'ow', 'ouch'	
Frowning	
Grimacing	
Creasing forehead	
Moaning and groaning	
Change in eyes (squinting, dull, bright, increased movement)	
Touching/holding sore area	
Guarding sore area	
Pulling away	
Resistance/defense	Present
Verbal aggression	
Agitated	
Physical aggression (e.g. pushing people and/or objects, scratching others, hitting others, striking, kicking)	
Flinching	
Not wanting to be touched	
Uncooperative/resistant to care	
Social-emotional aspects/mood	Present
Cranky/irritable	
Screaming/yelling	
Grim face	
Not allowing people near	
Upset	
Flushed, red face	
Restless	
Sad look	

Sub scale scores

Facial and vocal expressions

Resistance/defense

Social-economical aspects/mood

Total checklist score:
