Title

The Person-centred care of Older People with cognitive impairment in Acute Care (POPAC) scale – psychometric evaluation

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Authors:

Laurie Grealish RN PhD
Associate Professor, Subacute and Aged Nursing Research
Menzies Health Institute Queensland, Griffith University & Gold Coast Health

Wendy Chaboyer RN, PhD
Director, NHMRC Centre of Research Excellence in Nursing (NCREN)
Menzies Health Institute Queensland
Griffith University

Emma Harbeck, B Psy (Honours)
PhD Candidate
School of Applied Psychology
Menzies Health Institute Queensland
Griffith University

David Edvardsson RN, PhD
Professor and Director
La Trobe University/Austin Health/Northern Health Clinical Schools of Nursing

Corresponding author
Laurie Grealish RN PhD (corresponding author)
Associate Professor, Subacute and Aged Nursing Research
Menzies Health Institute Queensland, Griffith University & Gold Coast Health
Robina Health Precinct
2 Campus Crescent, Robina 4226,
Queensland, Australia
Email: l.grealish@griffith.edu.au
Phone: +61 7 5635 6277
Mob: +61 0 412091968
Fax: +61 7 5552 8526

The Person-centred care of Older People with cognitive impairment in Acute Care (POPAC) scale – psychometric evaluation

Abstract

Aim: Test the reliability and validity of the Person-centred care of Older People with cognitive impairment in Acute Care (POPAC) scale to determine nurses' perceptions of person-centred care.

Background. One-third of older adults admitted to hospital are at risk of serious hospital-acquired complications such as falls, infections, and pressure injuries because of cognitive impairment. These risks can be reduced through person-centred practices. The POPAC scale is a self-report staff instrument to explore the extent to which person-centred practices are undertaken; however psychometric testing is limited.

Methods. Cross-sectional sample of acute care nurses (n=240) in Queensland, Australia completing self-report questionnaires. Psychometric analyses of item performance, reliability and validity was conducted.

Results. Item analysis revealed independent items. One item was removed due to negatively associating with the scale, improving total Cronbach's alpha from 0.76 to 0.84. The three original POPAC factors were maintained with regrouping of items. Confirmatory factor analysis confirmed the revised model.

Conclusions. The revised POPAC (POPAC-R) scale had satisfactory psychometric properties when used as a total scale.

Implications for nursing management: Scale brevity and simplicity together with rigorous development and testing indicates POPAC-R may be useful for quality improvement programs into care of older people in hospitals.

Key words: Person-centred care; POPAC; older person; cognitive impairment; nurse

Aim

The aim of this study was to test the reliability and validity of the Person-centred care of Older People with cognitive impairment in Acute Care (POPAC) scale, an instrument used to determine nurses' perceptions of person-centred care.

Background

In Australia, the use of hospital services by older people is increasing, with people over 65 years of age accounting for 40% of hospitalisations in 2014 (Australian Institute of Health and Welfare [AIHW], 2015). Globally, the 2013 United Nations (UN) report into ageing proposes that the world population of older people has grown from 9.2% of the population in 1990, to 11.7% in 2013, and is expected to reach 21.1% by 2050 (UN, 2013), making hospital care of older people an important international matter.

Rather than presenting as a homogenous group, older people have diverse needs and often can present with invisible vulnerabilities that can lead to rapid deterioration (Parke & Hunter, 2014). Cognitive impairment, particularly delirium and dementia, present specific challenges to health services generally and acute care settings specifically, with one Australian prospective study finding almost 30% of 493 patients over the age of 70 years to be cognitively impaired (Travers et al., 2012). People with cognitive impairment are at higher risk of hospital-acquired complications such as injury from falls (Härlein et al., 2010), as well as urinary tract infections, pressure injuries, and pneumonia (Bail et al., 2013). These injuries contribute to increased length of stay (McCusker et al., 2003) and increased likelihood of death (Shi et al., 2012). There is an emerging view that many of these complications may be attributable to nursing care (D'Amour et al., 2014).

Person-centred approaches to care for people with cognitive impairment, such as early

mobilization, nutritional assistance, and therapeutic cognitive activities, reduce decline in activities of daily living and nutritional status (Chia-Hui et al., 2011) and incidence and severity of delirium (Inouye et al., 1999). The definition of person-centred care varies, however the Institute of Medicine (2006) defines it as "encompasses qualities of compassion, empathy, and responsiveness to the needs, values, and expressed preferences of the individual patient" (p48). Person-centred care values the relationship between the health professional and person, is enabled by good communication across the health service team, and involves the person and family in the care (Scholl, Zill, Harter, & Dirmaier, 2014).

Guidelines for the management of people with cognitive impairment emphasise a person-centred approach (National Institute for Health and Care Excellence [NICE], 2010; Australian Commission for Safety and Quality in Health Care [ACSQHC], 2014a; ACSQHC, 2014b). However, nursing practices that are valued in a person-centred approach may be 'missed' in acute care nursing practice (Ball et al., 2014). Over time, a culture of acceptance of task-based hierarchies, where the medically related care tasks are prioritised over person-centred care, emerges with person-centred care often not attended (Ausserhofer et al., 2014). In an early Australian qualitative study, nurses reported that their attempts to undertake best practice were stymied by sociocultural, environmental and economic issues (Borbasi et al., 2006). Findings from a Swedish study showed how an organisational focus on disease-orientation and efficiency, combined with busy and inflexible work environments, contributed to inability to meet the needs of older people with cognitive impairment, with subsequent patient suffering, family exclusion and staff frustration (Nilsson et al., 2013, p1685). Adopting a person-

centred approach in acute care wards is one possible way forward to meeting the needs of older people with cognitive impairment (Grealish & Chaboyer, 2015).

Measuring person-centred care allows an organisation to "gauge whether people's needs and preferences are being addressed" (de Silva, 2014). Knowing health professionals' perspectives on person centred care can assist with education and practice development program planning. The Person-centred care of Older People with cognitive impairment in Acute Care (POPAC) scale aims to determine the extent to which acute care nursing staff perceive and report their care practices for older people with cognitive impairment are based on best available evidence that is personalised to meet these patients' needs (Edvardsson et al., 2013). The POPAC scale was designed as a self-report instrument (Edvardsson et al., 2013).

The original scale was evaluated on a sample of 212 nurses in a tertiary metropolitan hospital in Australia (Edvardsson et al., 2013) and further evaluated in a mixed sample of 293 nurses and physicians in Sweden (Nilsson et al., 2013). Establishing instruments that enable valid and reliable measurements for national and international comparisons of person-centred care for this highly vulnerable population is important; information about the extent to which nursing services are perceived to be person-centred can be used to evaluate health service initiatives that aim to be person-centred (Edvardsson et al., 2013). Further testing of the POPAC scale has been recommended in variable samples and cultures in order to better understand the value of the scale (Edvardsson et al., 2013, p85), and to confirm the three-factor dimensionality and subscale reliability (Nilsson et al., 2013). Permission was granted to use and evaluate the psychometric properties of the POPAC scale in a different Australian jurisdiction.

Methods

Design

A descriptive survey of nurses was undertaken in two acute care Australian hospitals, within one health service in Queensland. Nursing staff from ten wards in the two hospitals were invited to complete the survey.

Setting and sample

The types of wards included medical (n=7), medical assessment (co-located with emergency department; n=2), and orthopaedic (n=1). These wards were selected because two-thirds of the patients were 65 years of age and older, and about 30% of these were expected to have cognitive impairment (based on Travers et al., 2012). Inclusion criteria included currently working as a registered or enrolled nurse in the selected wards, and being available and willing to participate.

The survey was comprised of demographic questions and the POPAC scale. The POPAC scale consists of 15 statements describing care processes and procedures that are central to person-centred care of older people with cognitive impairment (Edvardsson et al., 2013). It focuses on staff perceptions of levels of person-centredness by asking the extent to which participants perceive the frequency of which recognised person-centred procedures are undertaken in the clinical environment. Three subscales have been described: (1) 'using cognitive assessments and care interventions' (items 1-5); (2) 'using evidence and cognitive expertise' (items 6-8); and (3) 'individualising care' (items 9-15) (Edvardsson et al., 2013, p82). Responses are provided on a six-point

Likert-type scale that ranges from *'never' (1), 'very rarely' (2), 'rarely' (3), 'frequently' (4), 'very frequently' (5), to 'always' (6).*

Three levels, item scores, subscale score and total scale score, can be used for descriptive, comparative and modelling purposes. Item scores are aggregated into the average of participant scores, subscale scores are calculated by summing the scores for items in the respective subscale then dividing this score by the number of items that was aggregated, and the total scale score is calculated by summing all 15 items then dividing by 15, therefore the possible range of subscale and scale scores is 1 to 6. Higher scores at the item, subscale and total scale reflect higher levels of person-centred care.

The original POPAC scale was reported to have satisfactory psychometric properties and performance in an Australian sample with a stable three-factor dimensionality indicating construct validity, which explained 53% of the variance accounted for in the original data (Edvardsson et al., 2013). The scale was reliable as evidenced by a total Cronbach's alpha of 0.87 and subscale Cronbach's alpha values of 0.74, 0.79, and 0.78 respectively for the three subscales (Edvardsson et al., 2013, p83). The reliability estimates of the original POPAC scale were not reproduced in a Swedish sample of acute care nursing and medical staff where subscales one and two did not reach the pre-set reliability cut-off of 0.7 (Nilsson et al., 2013). Furthermore, in this study, some reported fit statistics of the model did not reach pre-set cut offs for acceptable fit (Nilsson et al., 2013, p4). Thus, further testing appeared warranted.

Nursing Unit Managers provided the numbers of staff, based on their current staff establishment, and the same number of surveys, with an information sheet, were

distributed to each ward for distribution by the Nursing Unit Manager or delegate. Completed surveys were deposited in a folder held in the Nursing Unit Manager or Clinical Facilitator office and collected each week over the four-week study period. No personally identifiable information was collected and participants were guaranteed confidentiality. Data were collected between July and August 2015.

Descriptive statistics were used to summarise the sample and item, subscale and scale scores. Item performance was evaluated through assessments of item means and standard deviations (SD), corrected item-total correlations, inter-item correlation and Cronbach's alpha if item deleted. Internal consistency reliability was evaluated by Cronbach's alpha, on the total scale and on subscales. Cut-offs for acceptable internal consistency were set to a Cronbach's alpha of >0.7, consistent with recommendations by Nunnally (1978), item-total correlations of >0.3, and inter-item correlations <0.7 to determine redundancy (Shum, O'Gorman, Myors, & Creed, 2013).

Given this was a developed tool, confirmatory factor analysis, based on the original three factor solution was planned, but if items did not meet pre-determined cut offs at the item analysis stage, an exploratory factor analysis to examine the factor structure before continuing on with confirmatory factor analysis was also planned. For the exploratory factor analysis, a significant Barlett's test of Sphericity and a Kaiser-Myer-Olkin (KMO) measure of sampling adequacy of <0.7 was set for sample suitability. As factors were expected to be correlated, an oblimin rotation would be used and item performance would be examined by applying a >0.4 factor loading. For the confirmatory factor analysis, model fit evaluation involved Chi-square/degrees of freedom (χ^2/df (normed χ^2)), the comparative fit index (CFI), the standardised root mean square residual

(SRMR), and the root mean square error of approximation (RMSEA). Hu and Bentler's (1999) and Byrne's (2001) recommended indices cut-off values for assessing fit were used and values set to an χ^2 /df of < 3, a CFI of >0.90, a SRMR of < 0.10, and a RMSEA of <0.08.

As variables were highly correlated and missing dated exceeded the 10% loss of total cases, missing values were replaced using regression imputation (Olinsky, Chen & Harlow, 2002; Tsikriktsis, 2005). Item 5 was reverse coded due to negative wording. IBM SPSS Statistics version 21 and IBM SPSS AMOS version 22 were used to analyse the data.

Ethical considerations

The Gold Coast Health Human Research Ethics Committee (HREC) provided ethical approval for the conduct of the study (14/QGC/183), with subsequent approval by the Griffith University HREC.

Results

Sample characteristics are shown in Table 1. In total there were 442 surveys distributed and 240 surveys returned; a 54.3% response rate. The sample was predominately females who were registered nurses and did not hold a post-graduate qualification in the care of older patients. The mean total score was 4.4 (SD=0.58), with a range of 2.2 - 5.6 and a skew statistic of -0.60.

[Please inset table 1 about here]

Item Performance

Individual item means and SD, corrected item-total correlations and Cronbach's, if item deleted, are shown in table 2. Inter-item correlations ranged from -0.33 (between Item 5 and Item 8) to 0.61 (Item 8 and Item 9), highlighting that each item was independent of each other and therefore no redundancy was found. The correlation between Item 8 and 9 was high, however percentage of overlap was only 37%, which was deemed acceptable (Shum et al., 2013). Initial item-total correlations were acceptable, ranging between 0.38 (item 1) and .71 (item 12). Corrected item total correlations are also shown in table 2. Item 1 did not quite meet the cut off criteria of >0.30 and item 5 was highlighted as a low scale fit due to its negative relationship with the scale and significant improvement of the scale Cronbach's alpha if deleted. At the sub-scale level Cronbach's alpha improved from .42 to .58 and at full scale level, from .80 to .84. Therefore, item 5 was deleted from the scale items and all subsequent analysis. The original POPAC scale alphas for this study are provided in table 2.

[Please insert table 2 about here]

Validity

Due to deletion of item 5, the limited contribution to the scale of item 1, and previous highlighted limitations of the scale (Edvardsson et al., 2013; Nilsson et al., 2013), an exploratory factor analysis was undertaken, with a three factor solution expected. KMO sampling adequacy was .86 and Bartlett's test of sphericity was significant at <.001, supporting factor analysis of the sample. As the domains were correlated, an oblique rotation was used with principle components for extraction. The three factor model was maintained with acceptable explanatory power, explaining 54% of the variance in the data. However, with the new factor structure, items had changed domains and variance

explained by the factor, as shown in Table 3 (factor loadings less than 0.4 suppressed). As shown in Table 3, factor 1 (Individualising care) contains items 10-14, explaining 35 % of the variance. Factor 2 (Using cognitive assessments and care interventions) contains items 1-4, and 6 and explains 11% of the variance, and finally factor 3 (Using evidence and expertise in cognition) contains items 7-9 and 15. Although there were movement of some items, the original factor titles were maintained as items contained within factors still reflected titles. Item 15 shared variance with factor 1 (0.399), however was retained in factor 3 due to stronger relationship with this factor (-0.546).

This revised pattern matrix was transcribed to AMOS for confirmatory factor analysis. The revised structure had acceptable model fit as evidenced through χ^2/df 2.34, an SRMR of 0.06, CFI of 0.90 and an RMSEA of 0.08 (CI 90% 0.060-0.089). Model fit, correlations between factors and standardised regression weights between items are shown in figure 1. All items standardised regression weights between items and latent variables (Factors) were significant and above the expected 0.40.

[Please insert table 3 about here]

Reliability

Internal consistency reliability was found acceptable for the POPAC revised scale on total score level, as evidenced by a Cronbach's alpha of 0.84. Factor 1 'Individualising care' obtained α=.63 and did not meet the reliability cut off of >0.7. Factors 2 and 3 exceeded the reliability cut off of >0.7, with factor 2 'Using cognitive assessments and care interventions' having an α=0.82, and factor 3 'Using evidence and expertise in cognition' having an α=0.76.

[Please insert figure 1 about here]

Discussion

Adopting a person-centred approach to care to older people with cognitive impairment in hospital is important for patients (Chia-Hui et al., 2011; NICE 2010; ACSQHC 2014a). Yet, in busy hospitals, where staff teams face numerous competing priorities in an ever-changing environment, it is common for person-centred care to be 'missed' (Ausserhofer et al, 2014). Nurses' perceptions of practice, in this case person-centred care practice, provide managers with an insight into the nurses' collective awareness about the needs of older people with cognitive impairment. The POPAC scale provides an easy to administer self-report instrument to assess nurses' perceptions about the person-centredness of their care practices (Edvardsson et al., 2013).

In our study, a three-factor structure of the POPAC scale remained. Reliability of the POPAC-R performed similar to two other studies. The original POPAC was 0.87 (Edvardsson et al., 2013), the Swedish POPAC was 0.82 (Nilsson et al., 2013) and the POPAC-R was 0.84. Chronbach's alpha for each subscale were better for subscales, 'using cognitive assessments and care interventions' (0.82 POPAC-R, compared to 0.74 original POPAC and 0.56 Swedish POPAC) and 'using evidence and cognitive expertise' (0.76 POPAC-R, compared to 0.79 original POPAC and 0.56 Swedish POPAC). The Cronbach's alpha for 'individualising care' was lower than the other two studies (0.63 POPAC-R, compared to 0.78 original POPAC and 0.83 Swedish POPAC). Construct validity testing yielded some similar results between the original POPAC and the revised POPAC. In the original testing of POPAC, a three factor solution accounting for 53% of variance was achieved (Edvardsson et al., 2013; the POPAC-R also had a

three factor solution and accounted for 54% variance. However, by moving some items from one subscale to another in the POPAC-R, both the reliability and validity of the scale were strengthened. Questions remain regarding the reliability of subscale, 'individualising care'. It appears that further refinement may be needed.

With international projections about the increasing percentage of older people in the population (UN, 2013), it is important to have valid and reliable measurements of their care to enable international comparisons (Edvardsson et al., 2013). Health service initiatives to promote person-centred practices can be monitored in many ways (de Silva, 2014). Understanding nurses' perceptions about collective person-centred practice can help managers to identify staff development needs. The POPAC-R scale may be used as an indicator of nurses' readiness to engage in practice development work in the area of person-centred care; low scores would indicate that nurses perceive that their collective practice is poor, opening up a space to discuss further development.

A baseline understanding of staff perceptions of their practice is fundamental to facilitating change. The POPAC-R can make individual staff perceptions public whilst still protecting confidentiality. Consistent with de-identified self-report surveys, the POPAC-R results can provide a starting point to problematize perceptions and the extent to which these are shared or deviating within a group. The POPAC-R can be used to examine the correspondence between perceptions and practice from various perspectives, and design interventions to improve and align perceptions and practice for benefit to recipients as well as providers of care. Further, using the sub-scale scores, practice development activities can be targeted to specific areas of individualising care, using assessments and care interventions, or using evidence and expertise in cognition. Work

teams can use collective work team perceptions, derived from the POPAC-R, to initiate

discussions about current practices and motivate them to make changes in relation to

agreed aspects of care in need of change.

Limitations

There are some limitations to this study. First, the sample selection was based on

convenience, sampling nurses in the local hospital service, which limits generalizability

of the findings. However, the findings seem theoretically transferable to other settings

and provides a promising empirical base for further work. Second, the response rate was

54.3%, which means that the final sample may or may not be representative for the

whole population. No follow-up was conducted with non-responders because the survey

was anonymous. Thus, those nurses who did not participate may hold different

perspectives on the care of older people with cognitive impairment. Third, the findings in

this study also indicate scale limitations in terms of sub-scale 1 requiring further

evaluation. Finally, a self-report scale is a relatively easy method of gaining such

understanding, even though there are limitations and challenges connected to self-report

in terms of providing socially acceptable (van de Mortel, 2008) and/or politically correct

responses (Donaldson & Grant-Vallone, 2002) that may or may not correspond to

behaviours in practice.

Conclusions

Person-centred care for older people with cognitive impairment in hospital is an

important issue in health care. Indicators that can assist organisations to monitor the

level of person-centredness in everyday practice are essential for continuous

improvement. The revisions to the POPAC scale provide a valid and reliable indicator of

person-centred care for older people with cognitive impairment when measured on total scale level. As such, it can be used in quality improvement, knowledge translation, and education work where nurses are primary caregivers. Further evaluation of subscale reliability would be valuable.

Implications for nursing management:

The POPAC-R survey is easy to administer, and can provide a quick snapshot of nurses' self-perceptions of person-centered care specific to this population. The POPAC-R survey results can be used for team, as well as individual, reflection on practice to identify areas for further development or innovation. A number of evidence-based guidelines to care for older people with cognitive impairment are emerging (ACSQHC, 2014a,b; Guideline Adaptation Committee, 2016). These guidelines can be used in combination with POPAC-R results to inform and continuously improve practice. The POPAC-R provides a useful checklist to monitor staff perceptions about person-centred care of older people with cognitive impairment overall, and in targeted areas such as individualising care, assessment and using evidence in practice.

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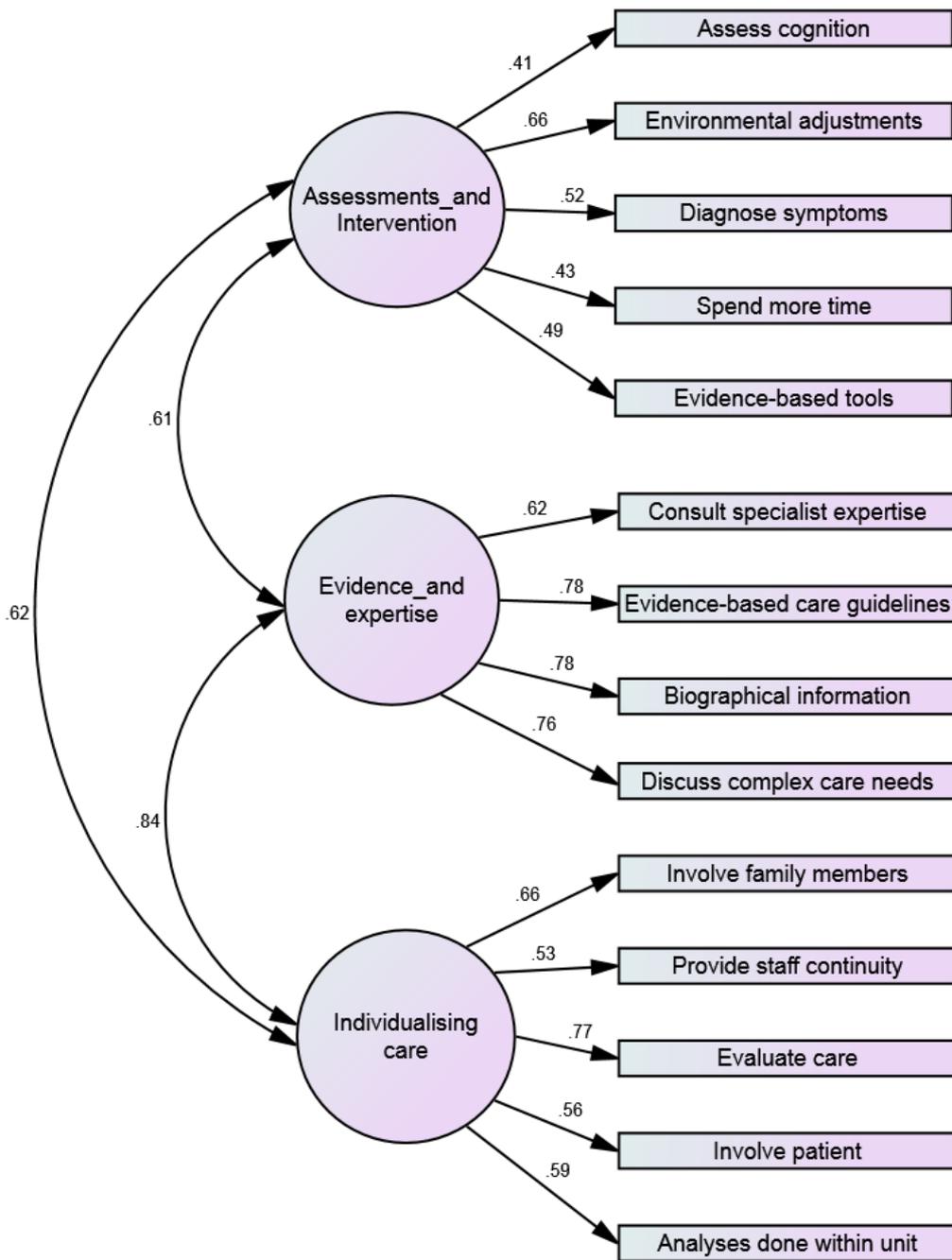
Figure 1 Confirmatory factor analysis of the POPAC-R scale

Table 1

Characteristics of survey respondents

	N (%)
Gender (n=238)	
Women	210 (88.2)
Men	28 (11.8)
Profession (n=240)	
Registered Nurses	197 (82.1)
Enrolled nurses	42 (17.5)
Other	1 (0.4)
Age Group (n=239)	
20-29 years	92 (38.5)
30-39 years	45 (18.8)
40-49 years	54 (22.6)
50-59 years	38 (15.9)
60+ years	10 (4.2)
Formal Post-graduate qualification in gerontology (n=239)	
No	223 (93.3)
Yes	16 (6.7)

Table 2. Item performance of the POPAC scale (N=240)

Item In my ward…	Mean	SD	Corrected item-total correlation	Cronbach's Alpha if item deleted
1. We assess the cognitive status of our older patients on admission.	5.1	1.02	0.27	0.76
2. We make environmental adjustments to avoid over-stimulation in older people with cognitive impairment (e.g. single rooms, noise reductions etc.).	4.7	1.03	0.50	0.74
3. We diagnose symptoms of cognitive impairment (e.g. dementias, delirium etc.).	4.0	1.43	0.35	0.75
4. We spend more time with older patients with cognitive impairments as compared to cognitively intact patients.	4.5	1.03	0.34	0.75
5. We leave older people with cognitive impairments alone in the ward.	3.8	1.97	-0.30	0.84
6. We use evidence-based tools to assess cognitive status of older patients (e.g. the MMSE, SPMSQ, CAM etc.).	4.4	1.47	0.38	0.75
7. We consult specialist expertise (e.g. psychologist, gerontologist) if we find that a patient has cognitive impairment.	4.4	1.21	0.52	0.74
8. We use evidence-based care guidelines in the care of older cognitively impaired patients.	4.7	1.08	0.60	0.73
9. We use biographical information about older patients' (e.g. habits, interests and wishes etc.) to plan their care.	4.3	1.17	0.56	0.73
10. We involve family members in the care of older patients with cognitive impairment.	5.0	0.89	0.54	0.74
11. We provide staff continuity for older patients with cognitive impairments (e.g. the same nurses providing care to these patients as often as possible).	3.9	1.18	0.46	0.74
12. We systematically evaluate whether or not older patients with cognitive impairment receive care that meets their needs.	4.5	1.04	0.64	0.73
13. We involve older patients with cognitive impairment in decisions about their care (e.g. examinations, treatments etc.).	4.3	1.08	0.42	0.75
14. We ensure that older patients with cognitive impairment have tests/ examinations/ consultations in the unit rather than having to go to another department.	4.2	1.05	0.45	0.74
15. We discuss ways to meet the complex care needs of people with cognitive impairment.	4.8	0.99	0.58	0.73

Note: Cronbach's alpha for Factor 1 (items 1-5) =.42, Factor 2 (items 6-8) =.68 and Factor 3 (items 9-15) =.83. Total scale (items 1-15) =.80.

Table 3

Factor Loadings of the final items included in the POPAC-R scale (N=240)

Item In my ward…. [old number]	Individualising care (Factor 1)	Using cognitive assessments and care interventions (Factor 2)	Using evidence and expertise in cognition (Factor 3)
1. We involve family members in the care of older patients with cognitive impairment. [10]	**0.543**		
2. We provide staff continuity for older patients with cognitive impairments (e.g. the same nurses providing care to these patients as often as possible). [11]	**0.532**		
3. We systematically evaluate whether or not older patients with cognitive impairment receive care that meets their needs. [12]	**0.677**		
4. We involve older patients with cognitive impairment in decisions about their care (e.g. examinations, treatments etc.). [13]	**0.897**		
5. We ensure that older patients with cognitive impairment have tests/ examinations/ consultations in the unit rather than having to go to another department. [14]	**0.622**		
6. We assess the cognitive status of our older patients on admission. [1]		**0.620**	
7. We make environmental adjustments to avoid over-stimulation in older people with cognitive impairment (e.g. single rooms, noise reductions etc.). [2]		**0.501**	
8. We diagnose symptoms of cognitive impairment (e.g. dementias, delirium etc.). [3]		**0.837**	
9. We spend more time with older patients with cognitive impairments as compared to cognitively intact patients. [4]		**0.474**	
10. We use evidence-based tools to assess cognitive status of older patients (e.g. the MMSE, SPMSQ, CAM etc.). [6]		**0.581**	
11. We consult specialist expertise (e.g. psychologist, gerontologist) if we find that a patient has cognitive impairment. [7]			**-0.707**

12. We use evidence-based care guidelines in the care of older cognitively impaired patients. [8]			**-0.766**
13. We use biographical information about older patients' (e.g. habits, interests and wishes etc.) to plan their care. [9]			**-0.618**
14. We discuss ways to meet the complex care needs of people with cognitive impairment. [15]			**-0.546**
Eigenvalue	5.00	1.48	1.05
Variance explained by factor	36%	11%	7%
Variance explained by the factor model			54%