Caring behaviors perceived by elderly residents of long-term care facilities: Scale development and psychometric assessment

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ABSTRACT

Background: To meet the growing need for relationship-centered nursing practice and for nursing school accreditation in Taiwan, nursing school curricula must include training in care for elderly populations in institutional settings. However, educators lack tools for evaluating student performance in such settings. The few tools currently available for measuring the caring in nurses perceived by elderly residents of long-term care facilities (LTCFs) are either inappropriate for education purposes or are culturally inappropriate for elderly populations in Taiwan.

Objectives: To develop a scale for measuring the caring behaviors of caregivers or student volunteers as perceived by a Taiwanese population of elderly residents of LTCFs and to establish the psychometric characteristics of the scale.

Methods: This study was conducted in two phases. In Phase 1, the researchers comprehensively reviewed the literature on caring. Based on the review, an Elderly Resident-Perceived Caring Scale (EPCS) was developed to measure the caring behaviors perceived by LTCF residents. To establish content and face validity, the items on the scale were reviewed by six experts in two rounds of Delphi study and by four elderly laypersons. In Phase 2, a convenience sample of 297 elderly residents from 18 representative elderly care facilities (i.e., skilled nursing facilities, independent living facilities, and assisted living facilities) in Taiwan were recruited to test the construct validity and reliability of the EPCS.

Results: The 14-item, 2-dimension questionnaire developed in this study explained 64.33% of the variance in caring perceived by the residents. Factor I, Comforting, included 11 items. Factor II, Encouraging, included 3 items. Cronbach’s α values were .924 for the total scale and .930 and .844 for the Comforting and Encouraging, respectively.

Conclusion: The psychometric qualities of the EPCS were supported. However, further testing of the scale is needed to confirm its psychometric properties in a larger sample.

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What is already known about the topic?

- Training in caring is now a nursing accreditation requirement in Taiwan.
- Numerous tools have been developed to evaluate caring behaviors and attitudes in nurses and in senior nursing students, but not been tested for psychometric qualities among junior nursing students in Asian.

What this paper adds

- The Elderly Resident-Perceived Caring Scale including comforting and encouraging two factors and has sound psychometric qualities for elder residents of the long-term care facilities in Taiwan.
- The Elderly Resident-Perceived Caring Scale is a useful measure of caring in health care providers and in student
volunteers as perceived by elderly residents of long-term care facilities.

1. Background

To meet the growing demand for relationship-centered nursing practice and for nursing accreditation in Taiwan, a tool is needed to measure the caring perceived by elderly residents of LTCFs. The emphasis on caring in relationship-centered care is complementary to other cost control measures applied in care facilities (Manning-Walsh et al., 2004). Rather than merely a set of physical tasks, caring can be viewed as a manifestation of being that requires knowledge, continuous exploration, and learning (Watson and Smith, 2002). Since caring is a core professional value in nursing, training in caring is now an accreditation requirement in Taiwan nursing education (TNAC, 2011). Although nursing educators are required to provide training in caring, no tool has been developed for measuring caring in junior nursing students who have limited clinical experience and limited experience taking care of elderly populations. For example, development of the Caring Behavior Inventory for Elders, a tool for measuring the caring in nurses as perceived by elderly patients in the United States, was based on expert surveys and a literature review (Wolf et al., 2006). Its measurement items include nursing behaviors related to specific care plans, treatments and pain relief. The measure is unsuitable for the educational purpose envisioned in this study, which was to evaluate caring behaviors in junior nursing students during visits with elderly residents of LTCFs over a 6-week period (2 hr per week). Similarly, items in the Caring Professional Scale developed by Swanson (2008) such as clinical competence, technical skill, and informative descriptions, are unrealistic measures for junior nursing students with limited practical experiences.

Except the need for academic accreditation in caring, two other concerns motivated this effort to develop a tool for measuring perceived caring. First, most instruments for measuring caring were developed for western populations (Watson, 2008a). Cultural differences limit their applicability in Asian countries such as Taiwan. For example, item 3 on the Caring Behavior Inventory for Elders, Helping you and your family to make decisions, is usually inapplicable in the family-oriented culture of Taiwan, in which frail elders rarely make decisions about their own care. Additionally, item 14, Knowing your likes, dislikes, and routines, is ambiguous because it measures three different aspects of caring. Second, currently available tools that do not use factor analysis or principal component analysis for measuring caring may not be psychometrically sound. For the factor extraction method needed for exploratory factor analysis, some statistical theorists suggest that principal axis factor extraction method is preferable to principal component analysis if the data have a non-normal distribution and if the aim is to acquire latent variables (Costello and Osborne, 2005). A growing body of literature conurs that parallel analysis is the best empirical method of factor retention in exploratory factor analysis (Dinno, 2009; Hayton et al., 2004; Thompson and Daniel, 1996). However, neither the Caring Behavior Assessment (Cronin and Harrison, 1988) nor the Caring Behavior Inventory for Elders has applied principal axis factor extraction method and parallel analysis. Therefore, a tool is needed to assist nursing educators in evaluating and optimizing their strategies for training students and for assessing the care quality perceived by elderly populations.

The Swanson Theory of Caring, which embraces five caring processes (Swanson, 1991), is one proposed theoretical framework for measuring caring. Currently available measurement instruments based on the above theory include the Caring Professional Scale and the Patient Perception of Hospital Experience with Nursing (Dozier et al., 2001). The factor structures in these measures, however, differ from the original theoretical construct and are appropriate for assessing western patients during hospitalization. For example, there is only one factor in the 15-item Patient Perception of Hospital Experience with Nursing and named as ‘feeling cared for’, and there is no factor structure on the Caring Professional Scale. Thus, in measuring caring perceived by Taiwanese elderly populations, the factor structure based on the Swanson theory needs further clarification.

2. Methods

2.1. Design and participants

This study was conducted in two phases. Item generation and assessment of content validity and cultural appropriateness were performed in the first phase, and psychometric properties of the instrument were evaluated in the second phase. In the first phase, the researchers performed a literature review to define the concept and to generate measurement items for the proposed Elderly Resident-Perceived Caring Scale (EPCS) suited for evaluating student volunteers. To establish content and face validity, the items were reviewed by six experts in two rounds of Delphi study and by four elderly laypersons. In the second phase, the construct validity and reliability of the EPCS were tested in a cross-sectional study with convenience sampling.

The inclusion criteria for this study were current residence in a LTCF, including skilled nursing facilities and intermediate care facilities (i.e., independent and assisted living facilities) in Southern Taiwan, age over 60 years, and ability to communicate, and score of 7 or higher on the Short Portable Mental Status Questionnaire. Residents with dementia were excluded because they could not accurately recall caring behaviors or understand the measurement scale. The final population was drawn from 18 LTCFs.

2.2. Ethical considerations

The study was approved by the Institutional Review Board at this facility (KMUH-IRB-980300). Questionnaire interviews were conducted after approval from all 18 participating LTCFs, and all participants indicated their consent to the study by signature or by fingerprint.
2.3. Item generation

To evaluate the caring behaviors of the staff of care facilities as perceived by their elderly residents, this study defined caring as the actions or attitudes of caregivers to understand, accompany, assist, and encourage elderly residents and to treat them as unique individuals. For item generation, the theoretical categories developed by Swanson (1991), including knowing, being with, doing, and enabling, were modified as understanding, accompanying, assisting, and encouraging, respectively. The four dimensions were defined as follows: (1) understanding: the sensitivity of staff to the emotions, language, and needs of the resident; (2) accompanying: the concern, patience, and honesty of staff and their willingness to share experiences with the resident and to listen actively; (3) assisting: the extent to which the staff ensured the safety of the residents and addressed their needs; and (4) encouraging: the extent to which staff appreciated, assured, and enabled the resident.

The initial item pool for the EPCS was also generated by comprehensive review of existing instruments, including the Caring Behavior Inventory for Elders (Wolf et al., 2006), Caring Professional Scale (Swanson, 2008) and the Caring Behaviors Measurement (Lee-Hsieh et al., 2005). To comprehensively capture the context of caring behavior in nursing students, the research team also interviewed three junior nursing students in group to determine their perceptions, abilities, and caring behaviors. To broaden the assessment, perceived behaviors were assessed in all personnel in the examined facilities, whether medical or non-medical. Questionnaires related to non-medical staff were modified by excluding items that involved professional skills such as administering medications and treatment or relieving ailments. To comprehensively assess the caring behaviors perceived by the residents, the scale included generalized items such as greeting me and personalized items such as appreciating my life story. Participants may respond to each item either on themselves or with assistance. A high score on the final 26-item scale indicated that the resident had a strong perception of caring behavior.

2.4. Description of the instrument

The questionnaires included written and verbal instructions and were administered to participants by trained interviewers or by the primary researcher. The demographic data were collected from the staff with permission from the residents. The participants were required to rate the care they perceived in general and to respond to each item on the EPCS using a 5-point Likert-type format ranging from 1 (absolutely disagree) to 5 (absolutely agree). Participants who lived in independent living homes completed the questionnaire with minimal assistance, but most participants residing in assisted living centers and nursing homes required individual interviews due to poor eyesight or illiteracy. Depending on factors such as hearing ability and the lucidity of the interviewee and the detail of the responses, each interview took 20–40 min to complete.

2.5. Assessment of content validity and face validity

To establish content validity, the 26 items were reviewed by Delphi technique. The review was performed by a panel of six members with expertise in either gerontological care or in caring behavior, including three nursing professors, one nursing home director, and two nursing home social workers. The experts reviewed all items on a 4-point scale for clarity, appropriateness, and representativeness regarding the concept of caring behavior perceived by elderly residents of LTCFs. Items that were identified as unclear, inappropriate or unrepresentative of the concept (i.e., rated below 4 on a 4-point scale) were either deleted or revised for use in the second round of the Delphi study, which was administered by email. Finally, 23 items that rated 4 by a consensus of the experts were selected. To evaluate the items relevant to the examined elderly LTCF residents in terms of face validity, four LTCF residents who were lay persons, who had varying demographic characteristics (i.e., age, gender, education, religion, and duration of LTCF residence), and who met the inclusion criteria for the study were invited to comment on the cultural appropriateness of the items and the clarity of their wording, which resulted in the revision of two items to improve readability. The final scale included 23 items (Table 1).

2.6. Recruitment and data collection

In Phase 2 of instrument development performed between September, 2009 and March, 2010, a convenience sample of elderly residents was recruited from 18 LTCFs across three different facility types, including nursing homes, independent living homes (i.e., veterans homes and senior residential homes), and assisted living centers. After obtaining approval from the participating institutions, potential participants were screened by assistants who

Table 1
Phase 1 version of EPCS.

1. Communicating with me in language I can understand.
2. Showing concern for me.
3. Ensuring my safety.
4. Showing no interest in my personal belongings. (reverse coded)
5. Recognizing how I feel.
6. Being honest with me.
7. Making me feel comfortable.
8. Appreciating my life story.
10. Treating me politely.
11. Helping me without being asked.
12. Praising me and acknowledging my achievements.
13. Being impolite to me. (reverse coded)
14. Being pleasant with me.
16. Greeting me.
17. Being impatient with me.
18. Forcing me to do what I do not want to do. (reverse coded)
19. Listening to me carefully.
20. Inviting me to participate in activities and showing me how.
21. Treating me gently.
22. Doing things that I enjoy.
23. Keeping promises made to me and giving me an explanation when they are broken.
had experience in caring for elders; three had masters’
degrees in social work or nursing and two had associate
degrees in nursing. After a 2-h on-site demonstration and
discussion to ensure scoring consistency, the assistants
assisted the residents in completing the questionnaire by
simply reading the questionnaire items. The inter-rater
reliability for the assistants’ interviews was tested by
randomly selecting five participants to complete the
instrument and then comparing the five scores given by
all assistants with those given by the primary researcher.
This procedure yielded an alpha coefficient of .91 and an
intra-class correlation coefficient of .83. All selected
participants also gave written consent to the study after
receiving a detailed explanation of the study by inter-
viewers. To encourage the participants to reply candidly,
all were assured that the questions had no right or wrong
answers and that all responses were confidential and
would not be disclosed to their caregivers or admin-
istrators. In the test–retest phase, 11 participants from a
various facilities voluntarily repeated the EPCS after 2
weeks.

When performing exploratory factor analysis, Tabach-
nick and Fidell (2001) recommended at least 300
participants to obtain a stable factor structure, regardless
of the participant-to-item ratio. To obtain an adequate
sample size, 315 residents were invited to participate in
the study. After eliminating those with incomplete data,
the final sample included 297 subjects, which was a 5%
(n = 18) attrition rate. The respondent-to-item ratio for
the final sample size was 12.91, which was considered
acceptable.

2.7. Data analysis

Data were analyzed using the Statistical Package for
Social Sciences (SPSS) for Windows version 17.0. Descrip-
tive statistics were used to summarize demographic
characteristics. The exploratory factor analysis was applied
to investigate inter-correlation patterns among items.

3. Results

3.1. Participant demographics

Table 2 presents the demographic data for all partici-
pants. The mean age of the participants was 80.73 years
(SD = 6.89; range, 60–99 years), and most (78.5%) were
aged 75 years or older. Of the subjects enrolled in the
study, 45.1% were widowed, 42.8% had an elementary level
education, and 31.6% were illiterate. More than half (58.2%)
were male, and more than half (62%) had activities of daily
living (ADL) scores above 60. Most (71%) lived in assisted-
living homes or nursing homes, and most (60%) had lived in
a home for longer than 1 year (range, 5 days to 34 years).

3.2. Data checking and item analysis

Item 23, which was generated from the dimension of
understanding and adopted from the Caring Behaviors
Measurement, was deleted because it is generally not
considered a caring behavior by elderly residents of LTCFs
(i.e., the item was inapplicable in more than 20 partici-
pants). Residents of LTCFs are often concerned that they
are inconveniencing caregivers when they request help
and rarely request explanations when promises to help are
broken. They typically ask for help only when they are
confident of receiving it. For item analysis, the criterion for
selecting scale items was a critical ratio (a measure of the
extent to which a given statement differs between
respondents with high and low scores on the instrument)
exceeding 3.0 or a correlation with remaining scale items
exceeding .4. Item 18 was selected by the research team for
inclusion in the understanding dimension. However, its
corrected item-total correlation coefficient was lower than
.4, and its critical ratio was lower than 3.0. Thus, item 18
was excluded from further item analysis.

3.3. Exploratory factor analysis

Data screening tests indicated that the 21-item EPCS
met the assumptions of factor analysis. The Measures of
Sampling Adequacy in all diagonal elements of the anti-
image correlation matrix exceeded .8, and off-diagonal
correlations were minimal (Field, 2006). The Kaiser–
Meyer–Olkin measure produced a coefficient of .93, which
indicated an adequate sample for factor analysis. The
Bartlett test of Sphericity obtained a value of 3408.43
(p < .001), indicating that the correlation matrix was
unlikely to be an identity matrix and was therefore
suitable for factor analysis (Tabachnick and Fidell, 2001).
The exploratory factor analysis of the 21-item EPCS was
performed using principal component extraction and
direct oblique minimum rotation to obtain a simple
solution with a highly loaded variable on each factor that
reflected the caring perceived by each subject. The initial
factor analysis showed a four-factor solution.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>mean: 80.73; SD: 6.89</td>
<td></td>
</tr>
<tr>
<td>&lt;75</td>
<td>64 (21.5)</td>
</tr>
<tr>
<td>≥75</td>
<td>233 (78.5)</td>
</tr>
<tr>
<td>ADL (Barthel index)</td>
<td></td>
</tr>
<tr>
<td>mean: 67.93; SD: 28.49</td>
<td></td>
</tr>
<tr>
<td>&lt;60</td>
<td>113 (38)</td>
</tr>
<tr>
<td>≥60</td>
<td>184 (62)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>173 (58.2)</td>
</tr>
<tr>
<td>Male</td>
<td>124 (41.8)</td>
</tr>
<tr>
<td>Type of institution</td>
<td></td>
</tr>
<tr>
<td>Assisted living facility</td>
<td>152 (50.7)</td>
</tr>
<tr>
<td>Nursing home</td>
<td>61 (20.3)</td>
</tr>
<tr>
<td>Independent living facility</td>
<td>87 (29)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>74 (24.9)</td>
</tr>
<tr>
<td>Married</td>
<td>75 (25.3)</td>
</tr>
<tr>
<td>Widowed</td>
<td>134 (45.1)</td>
</tr>
<tr>
<td>Divorced</td>
<td>14 (4.7)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>No formal education</td>
<td>94 (31.6)</td>
</tr>
<tr>
<td>Primary</td>
<td>127 (42.8)</td>
</tr>
<tr>
<td>Secondary</td>
<td>54 (18.2)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>22 (7.1)</td>
</tr>
</tbody>
</table>


Table 2
Demographic characteristics of participants (N = 297).

The factor analysis revealed four factors that explained
61% of the variance in the remaining items. The
four-factor structure is shown in Table 3.
To avoid component overextraction when using principal components analysis for exploratory factor analysis, parallel analysis is the recommended method of determining significant principal components (Franklin et al., 1996). A parallel analysis involves comparison of random eigenvalues obtained by the RanEigen program (Enzmann, 1997) with initial eigenvalues obtained in the initial factor analysis. Components are retained if their eigenvalues exceed their respective parallel analysis eigenvalues from the random data. This parallel analysis resulted in two factors retained.

A second factor analysis using principal axis factor extraction with two fixed factors was conducted using 21 items. To reduce the incidence of items cross-loading onto other factors and to suppress items that were weakly associated with the factors, only factor loadings of 0.5 were interpreted. Seven items (4, 5, 9, 20, 22, 13, 17) failed to acquire salient loading. Thus, 14 of the original items were retained. Finally, the same factor analysis was performed a third time on the remaining 14 items to confirm the stability of the factor structure. The resulting two-factor structure included 11 items attached to Comforting (an understanding and respectful attitude toward the residents as well as concern about their safety and comfort) in Factor 1 and 3 items attached to Encouraging (appreciation or praise in response to the life story or performance of the residents) in Factor 2. The summary in Table 3 shows that the 2-factor solution accounted for 64.33% of the variance in caring perceived by the residents. No items in the pattern matrix were bi-dimensional.

### 3.4. Internal consistency and reliability

Internal consistency and reliability of the total scale and subscales were assessed using Cronbach’s alpha. An alpha coefficient above .80 indicates acceptable internal consistency and reliability (Streiner and Norman, 2003). The alpha coefficient was .92 in the total scale and ranged from .84 to .93 in the two subscales. The split-half Spearman–Brown coefficient of .88 further confirmed the internal consistency and reliability of the EPCS. The stability of the EPCS was confirmed by a test–retest Pearson correlation coefficient of .98 (p < .001) with intra-class correlation of .98 (95% CI 0.93–0.99).

### 4. Discussion

Although convenience sampling limits generalizability, the sample in this study includes three ethnic groups (Ho-Lo, Hakka, and Mainland Chinese) living in LTCFs (including independent-living care homes, nursing homes, and assisted-living care homes) in Taiwan. Since the Taiwanese population includes mainly the above three ethnicities. Thus, the elderly Taiwanese population in this study was considered adequately represented. Applying exploratory factor analysis to explore the EPCS patterns synthesized from western scales and conceptual frameworks resulted in a different structure for the Taiwanese elderly population. However, the resulting two-factor structure incorporated 14 items and was theoretically bound to the Swanson concept of the caring process and to other scales. Items in Factor 1 (Comforting), which involve three dimensions of caregiver attitudes and behaviors (i.e., understanding, accompanying, and providing assistance), correspond to the three processes (knowing, being with, and doing for) in the Swanson conceptualization of caring and are consistent with the observed overlap in processes in that study (Swanson, 1993). Factor 1 was also analogous to attending to individual needs in the Caring Behavior Inventory for Elders (Wolf et al., 2006), to assistance and supportive behavior in the Caring Behavior Assessment (Cronin and Harrison, 1988), and to healing environment and meeting human needs in the Caring Assessment Tool (Duffy et al., 2007) and is consistent with the Watson definition of a supportive/protective/corrective environment (Watson, 2008b). Like the Caring Behavior Inventory for Elders, this factor contained the most items and had the highest variance in perceived caring. Our findings were also consistent with Chao and Roth (2005), who showed that residents expect to be treated as family, to have their needs met, and to be respected.

Factor 2, Encouraging, which encompassed appreciating the life stories of the residents, acknowledging their achievements, and praising their performances, is analogous to Humanistic Care in the Caring Nurse–Patient Interaction short scale (Cossette et al., 2008) and to encouraging manner in the Caring Assessment Tool (Duffy et al., 2007). This factor is consistent with the Swanson concepts of enabling and maintaining belief and also with the Watson concepts of instilling faith–hope and existential-phenomenological-spiritual forces. Providing encouraging implies that, when elderly residents of LTCFs are treated as capable, they are empowered and encouraged to live with confidence and hope. This view of encouraging behaviors is consistent with the Watson notion that sensitivity to environmental triggers promotes caring and healing processes and is also consistent with the dwelling notion that caring allows one to see with the heart with a consciousness of the dignity of others (Watson, 2008b). However, exploratory factor analysis showed only

### Table 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loadings</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Factor 1</td>
</tr>
<tr>
<td>2</td>
<td>.840</td>
</tr>
<tr>
<td>6</td>
<td>.836</td>
</tr>
<tr>
<td>10</td>
<td>.796</td>
</tr>
<tr>
<td>3</td>
<td>.761</td>
</tr>
<tr>
<td>21</td>
<td>.724</td>
</tr>
<tr>
<td>11</td>
<td>.716</td>
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<td>19</td>
<td>.700</td>
</tr>
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<td>7</td>
<td>.695</td>
</tr>
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<td>14</td>
<td>.681</td>
</tr>
<tr>
<td>1</td>
<td>.648</td>
</tr>
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<td>16</td>
<td>.630</td>
</tr>
<tr>
<td>12</td>
<td>.058</td>
</tr>
<tr>
<td>8</td>
<td>.004</td>
</tr>
<tr>
<td>15</td>
<td>.236</td>
</tr>
<tr>
<td>Cumulative percentage of total variance explained</td>
<td>52.60%</td>
</tr>
<tr>
<td>Cronbach’s alpha (95% CI)</td>
<td>.930</td>
</tr>
<tr>
<td>(918–941)</td>
<td>(811–872)</td>
</tr>
<tr>
<td>Total alpha (95% CI)</td>
<td>.924</td>
</tr>
</tbody>
</table>
three items in Factor 2. Item selection for this scale, after a thorough literature review, assumed that expertise in gerontological care alone may be inadequate for improving care of the elderly. Future studies may consider generating additional factors associated with encouragement of elderly residents of LTCFs.

The wordings of the items in EPCS are similar to Caring Behavior Inventory for Elders, Caring Professional Scale, and Patient Perception of Hospital Experience with Nursing. For example, all items for measuring caring behaviors are worded positively. Although patients in clinical setting can discriminate between caring and uncaring behavior, Riemen (1986) proposed that uncaring behaviors such as emotional distance and belittling and inhumane behaviors can still cause negative feelings. In the current study, three negatively worded items that were grouped together were deleted because two of them (items 17 and 18) had factor loadings lower than .5, which suggested method bias rather than a substantive structure of a scale (Podsakoff et al., 2003). These two items were originally obtained by evaluating the tone of the participants during interviews and were intended to minimize their response bias. For social and cultural reasons, the participants in this study may have been reluctant to indicate agreement with negatively worded items used to assess their perceptions of their caregivers. The results were consistent with the findings of Chao and Roth (2005) that socio-cultural determinants of appropriate behavior reduce complaints by residents and were also consistent with those of Anderson et al. (2003), who proposed that power relations between caregivers and elderly residents are inherently unequal. Elderly residents of long-term care facilities who depend on caregivers may be reluctant to characterize their caregivers as impolite or impatient, which could disrupt harmonious interpersonal relationships. However, these artifactual response factors may be resolved by rephrasing reverse-coded items as positive statements (Idaszak and Drasgow, 1987). Thus, in future studies, items designed to measure uncaring behaviors should be worded cautiously.

One limitation of this study was the difficulty in recruiting elderly participants to conduct confirmatory factor analysis and to confirm the theoretical framework. Although the parallel analysis confirmed that a two-factor solution explained 60% or more of the variance in the caring perceived by the residents to be indicators of caring, this two-factor structure requires further verification by confirmatory factor analysis in larger samples. Additionally, although all participants were ensured of confidentiality, some may have been reluctant to criticize their facilities or their caregivers, which is not considered socially acceptable, especially in Taiwanese populations in this age group. In future studies, negatively worded items should be worded carefully so that questionnaire responses accurately reflect the views of the residents. Further analysis using the item response theory model may also improve measurement precision.

5. Conclusion

To conclude, this study proposed some initial steps in assessing the validity and reliability of the EPCS. Although caring perceived by elderly residents of LTCFs is a core measure of the efficacy of their caregivers, few scales have been developed to assess the perceptions of such residents in Taiwanese populations. Further research is needed to develop such measures, which would be of great value to employers, nurses, assistants, volunteers, and multidisciplinary teams in LTCFs. The results of the 14-item factor analysis have implications for clinical practice, education and research. First, the two factors in the EPCS that measure explicit acts of caring provide a reference for therapeutic interaction with elderly residents of LTCFs. Caregivers can use these 14 indicators to implement resident-centered care and to address the varying needs of residents, including the needs for physical assistance, social interaction, and psychological comfort. In terms of educational applications, the EPCS provides indicators for (1) curriculum evaluation for college courses in gerontological nursing and long-term care and for (2) development of institutional orientation and education programs for caregivers or volunteers. As with any new instrument, additional study is needed to assess its utility over time and in different populations. Future studies of EPCS may examine (1) whether this scale provides an accurate measure of living quality of institutional residents, (2) whether application of this scale in a sample of nursing students has instructional value for improving perceived caring in this population as construct validity assessment is an ongoing process, and (3) whether additional items associated with the encouraging factor are warranted.

Conflict of interest: There are no conflicts of interest.

Funding: National Tainan Institution of Nursing supported via research fee on research assistance and sending official document for doing research on the sites.

Ethical approval: The study was approved by the Institutional Review Board at Kaohsiung Medical University Hospital with reference number of KMUH-IRB-980300.
Appendix A

請依與這裡的工作人員相處的實際情境來回答評分之：5分（極符合），表示此描述完全合乎事實；4分（符合），表示此描述八成合乎事實；3分（中等符合），表示此描述一半合乎；2分（有點符合），表示描述有一點符合事實；1分（不符合），表示此描述不符合事實。

Please use the following scale to respond to each item regarding your interaction with the staff: 5: absolutely agree, 4: mostly agree, 3: partially agree, 2: mostly disagree, 1: absolutely disagree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 用您懂得話跟您說</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. 有問您</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. 注意您的安全</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. 對您的事沒興趣</td>
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References


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