Original article

Translation, modification and validation of the Chinese version of a knowledge assessment instrument regarding pressure ulcer prevention

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Objective: This study sought to translate, modify and validate an instrument developed by Beckman and colleagues to assess the knowledge of clinical nurses regarding pressure ulcers.

Methods: A methodological study design was used. The instrument was translated into Chinese and back-translated into English. A six-expert panel was invited to evaluate the content validity, and a pilot test was subsequently performed on the test-retest stability of the translated instrument. A convenience sampling method was used to recruit 240 nurses from a university teaching hospital in the Mainland of China. In total, 186 valid questionnaires were collected with a 77.5% valid return rate. The validity of the multiple-choice test items (item difficulties and discriminating indices) and internal consistency reliability were evaluated.

Results: The translated and modified instrument demonstrated acceptable psychometric properties, as follows: (1) the overall content validity index (CVI) was 0.91, (2) the overall test-retest reliability was 0.826, (3) the item difficulty indices were between 0.46 and 0.93, (4) the overall values for discrimination were 0.28–0.55, and (5) the Cronbach’s α for the internal consistency were 0.792 for the overall instrument and 0.426–0.804 for the sub-themes.

Conclusions: This study represents the first trial to translate and modify an existing instrument that measures the knowledge of pressure ulcers in a Chinese Mainland sample. The instrument demonstrated acceptable psychometric properties and could be applied in cross-cultural nursing practices, including nursing education, research and practice, to evaluate knowledge about pressure ulcer prevention.

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1. Introduction

Pressure ulcers are painful, costly, and often preventable complications that challenge many individuals in hospitals, nursing homes and home care. Pressure ulcers particularly affect those who are old, seriously ill and immobile. Pressure ulcer patients’ physical sufferings include pain, a smell, fluid leakage and immobility, and emotional stresses include changes in appearance, body image, loss of independence and control, worries about healing and social isolation. Patients with pressure ulcers cost 50% more than patients without this condition in acute care hospitals in the United States. The cost attributable to pressure ulcer care in the year 2006–2007 was 9.89 million pounds in the UK. Xue and colleagues reported that pressure ulcers elicit substantial financial burdens for patients, families and health care systems in the Mainland of China. Kallman and colleagues stated that “the risks to the patient for developing pressure ulcers can actually be assessed, and measures to prevent ulcers from occurring and growing can be taken. Nevertheless, all depends on caregivers’ (knowledge, skills and attitudes)’. Nurses are patients’ primary caregivers and thus have the greatest responsibility for preventing the development of pressure ulcers. A European study demonstrated that no more than 10% of patients who are at risk receive adequate preventive care...
due to inadequate knowledge among nurses.9 King suggested that nurses’ knowledge of the wound healing process and management was limited and that nurses found it difficult to keep up to date with current advances due to poor staffing and low morale and motivation.9 Similarly, a preliminary survey conducted in the Mainland of China revealed that due to the shortage of the nursing workforce, constrained resources, and inadequate knowledge about pressure ulcers, pressure ulcer prevention measures were quite inadequate.10

A valid and reliable assessment tool is crucial for determining whether clinicians have appropriate knowledge of pressure ulcer prevention. The literature revealed that Beeckman et al.11 developed a knowledge assessment instrument about pressure ulcer prevention that is the most updated and has been widely used in Europe. However, no Chinese version is available. Based on strong requests from our clinical colleagues, our research team decided to create a Chinese version.

The aim of this study was to translate, modify and validate the instrument developed by Beckman and colleagues for assessing pressure ulcer knowledge among clinical nurses.

2. Methods

2.1. Design

A methodological study design was applied. The study consisted of the following 3 phases: (1) translation and back-translation of the original instrument, (2) evaluation of content validity and stability of the translated version of the instrument, and (3) evaluation of the internal consistency reliability and other psychometric properties of the translated version of the instrument.

2.2. Sample

The population consisted of 240 registered nurses who were working in hospital units that included surgical, medical, geriatric, oncologic, and gynecologic wards and the intensive care unit. The inclusion criteria were being a full-time registered nurse, the abilities to read and write Chinese, and the willingness to participate in the study. In total, 186 valid questionnaires were collected from 240 samples for a 77.5% valid return rate.

2.3. Ethical considerations

Before beginning the research project, the permission to use the questionnaire and ethical approval were obtained from the corresponding author Dr. Dimitri Beeckman and the Macao Polytechnic Institute, respectively. All participants were informed about the purposes and the methods of the study and assured that their participation in the study was voluntary and that they could withdraw from the study at any time. Written consent was obtained from each participant.

2.4. Instruments

The instrument consisted of two parts, i.e., the Demographic Data Form and the Questionnaire of Knowledge Assessment Instrument for Pressure Ulcer Prevention. The instrument consisted of 6 themes with 26 items that included the following: i. etiology and development (6 items), ii. classification and observation (5 items), iii. risk assessment (2 items), iv. nutrition (1 item), v. reduction in the amount of pressure/shear (7 items), and vi. reduction in the duration of the pressure/shear (5 items). The content validity was 0.78–1.00. The item difficulty indices of the questions ranged from 0.27 to 0.87, and the item discrimination values ranged from 0.29 to 0.65. The overall internal consistency reliability (Cronbach’s α) was 0.77.11

2.5. Procedure

In the first phase, the original version of the instrument was translated into the Chinese language and a back-translation was created. A six-expert panel was invited to evaluate the content validity using a 4-point Likert scale (ranging from 1 = not relevant to 4 = very relevant). Additionally, the expert panel was instructed to comment on each item regarding the accuracy, clarity and cultural relevance of the translation and to provide suggestions about the addition or deletion of any item. In the first round, 3 of the 6 experts suggested the addition of item(s) to themes iii (risk assessment) and iv (nutrition). Based on an extensive literature review and the experts’ opinions, single new items were added to themes iii and iv, which resulted in an instrument composed of 28 items (Appendix). A second round involving the evaluation of the content validity was conducted, and the content validity indices each item (CVI = 0.79–0.97) and the overall score were calculated (CVI = 0.91). The items were modified to yield a final Chinese version of the Instrument of Assessing Knowledge of Pressure Ulcer Prevention, which was abbreviated as IAKPUP.

In the second phase, the test-retest reliability of the IAKPUP was evaluated. A convenience sampling method was used to recruit 20 nurses over a 20-week interval. Pearson’s r was used to estimate the stability of the instrument.

In the third phase, a cluster sampling method was used to recruit 240 participants from a university teaching hospital. Cronbach’s alpha was used to estimate the internal consistency reliability of the IAKPUP, and the item difficulties and discriminating indices were applied to evaluate the validities of the multiple-choice test items of the IAKPUP.

2.6. Data analysis

The data were analyzed using SPSS 19.0. The answers to the questions were re-coded as dichotomous variables (i.e., correct and incorrect). Descriptive analysis was employed to describe the demographic characteristics of the participants. The item difficulties and discriminating indices were applied to evaluate the validities of the multiple-choice test items of the IAKPUP. The internal consistency of the IAKPUP was determined using Cronbach’s alpha.

3. Results

3.1. Demographic characteristics of the participants

The majority of participants were female (96.2%), the mean age was 35.3 years (SD = 10.9), and the majority of the participants held associate degrees (44.1%) followed by bachelor degrees (34.4%).

3.2. Test-retest reliability

The overall intraclass correlation coefficient was 0.826, and these values were 0.671–0.892 for the sub-themes (Table 1).

3.3. Validity of the multiple-choice test items

The item difficulty indices of the IAKPUP items varied between 0.46 (or 45.6%) and 0.93 (or 92.5%). The overall discrimination values (D-values) were between 0.28 and 0.55. None of the items had a negative discriminating value (Table 2).
3.4. Internal consistency reliability

The internal consistency reliabilities for the overall instrument and the sub-themes are presented in Table 3. The Cronbach’s α were 0.792 for the overall instrument and 0.426–0.804 for the sub-themes.

4. Discussion

The purpose of this methodological study was to translate, modify and evaluate an existing instrument to create a new version of the instrument with sound psychometric properties for use in the assessment of a wide range of essential pressure ulcer knowledge among clinical nurses. Examinations of the accuracy of the translation and the cultural relevance are critical steps in the adoption of an instrument that was developed in another language. Discrepancies in translation, wording and grammar were examined and modified by the first author and a bilingual expert, and these measures effectively confirmed the semantic equivalence of the translated instrument.12 Content validity is the most important psychometric property of an instrument. The evidence regarding the content validity of the IAKPUP was based on the judgments of six experts. Although some experts did not provide a score in the first round, they provided constructive suggestions regarding the addition of items to two of the sub-themes (i.e., risk assessment and nutrition). Based on an extensive literature review and the experts’ opinions, single new items were added to each of these two themes. These modifications were congruent with the suggestion of Beeckman and colleagues that “the instrument should be modified each time that fundamental aspects within this body of knowledge change.”13 The content validity indices (CVIs) of modified version ranged from 0.79 to 0.97 for the items, and the CVI of the overall instrument was 0.91. These values generally met the acceptable CVI of 0.80 or greater that is considered to indicate good content validity.13

The stability of the IAKPUP was examined using test-retest reliability in a pilot study with 20 samples. The overall intraclass correlation coefficient was 0.826, and these values were 0.671–0.892 for the sub-themes. These values were considered satisfactory based on the recommendations of Polit and Hungler.13 However, the intraclass correlation coefficients for the individual items varied from 0.671 (reduction of the amount of pressure/shear) to 0.892 (nutrition). One possible explanation for these observations is that there were only two items in the nutrition theme. The participants’ responses on the second administration of the questionnaire might have been influenced by the memory of their responses on the first administration. This memory-related interference resulted in a spuriously high reliability coefficient.1 The lowest correlation coefficients were for the reduction of the amount of pressure/shear ($r = 0.671$) and the duration of pressure/shear ($r = 0.689$) themes. These results contradict those of the study by Beeckman and colleagues in which the reduction of the duration of pressure/shear theme exhibited the highest correlation coefficient ($r = 0.94$).11 It is difficult to explain the exact reason for this discrepancy, but one possible explanation is that several questions within these two themes included numeric answers, which might have led to confusion when answering them as confirmed by the percentage of correct answers illustrated in Table 2. Another possibility is that there were more items in these two themes than in the other themes. The participants’ responses were not influenced by their memories.

The validities of the multiple-choice test items were determined with item difficulty and instrument discrimination indices. Based on the results, it could be argued that the discrimination ability of the IAKPUP was established. The overall values for item difficulty were satisfactory, although one item in the nutrition theme resulted in a high percentage of correct answers (92.5%), which is consistent with the results of the original study by Beeckman et al.11 This item

### Table 2

<table>
<thead>
<tr>
<th>Theme</th>
<th>Question number</th>
<th>Item difficulty (percentage of correct answer, %)</th>
<th>Intraclass correlation coefficient</th>
<th>D-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme I</td>
<td>1</td>
<td>58.6</td>
<td>0.68**</td>
<td>0.49</td>
</tr>
<tr>
<td>Etiology &amp; development</td>
<td>2</td>
<td>89.4</td>
<td>0.49**</td>
<td>0.31</td>
</tr>
<tr>
<td>Classification &amp; observation</td>
<td>3</td>
<td>46.0</td>
<td>0.51**</td>
<td>0.33</td>
</tr>
<tr>
<td>Risk</td>
<td>4</td>
<td>50.1</td>
<td>0.67**</td>
<td>0.52</td>
</tr>
<tr>
<td>Nutrition</td>
<td>5</td>
<td>56.8</td>
<td>0.71**</td>
<td>0.48</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>6</td>
<td>90.5</td>
<td>0.58**</td>
<td>0.28</td>
</tr>
<tr>
<td>Theme II</td>
<td>1</td>
<td>67.8</td>
<td>0.81**</td>
<td>0.55</td>
</tr>
<tr>
<td>Classification &amp; observation</td>
<td>2</td>
<td>87.9</td>
<td>0.66**</td>
<td>0.36</td>
</tr>
<tr>
<td>Risk assessment</td>
<td>3</td>
<td>80.1</td>
<td>0.72**</td>
<td>0.44</td>
</tr>
<tr>
<td>Nutrition</td>
<td>4</td>
<td>68.4</td>
<td>0.75**</td>
<td>0.51</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>5</td>
<td>62.3</td>
<td>0.64**</td>
<td>0.39</td>
</tr>
<tr>
<td>Theme III</td>
<td>1</td>
<td>92.1</td>
<td>0.50**</td>
<td>0.29</td>
</tr>
<tr>
<td>Risk assessment</td>
<td>2</td>
<td>87.5</td>
<td>0.81**</td>
<td>0.45</td>
</tr>
<tr>
<td>Nutrition</td>
<td>3</td>
<td>91.3</td>
<td>0.60**</td>
<td>0.32</td>
</tr>
<tr>
<td>Theme IV</td>
<td>1</td>
<td>89.4</td>
<td>0.59**</td>
<td>0.30</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>2</td>
<td>92.5</td>
<td>0.47**</td>
<td>0.29</td>
</tr>
<tr>
<td>Theme V</td>
<td>1</td>
<td>51.6</td>
<td>0.48**</td>
<td>0.32</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>2</td>
<td>67.8</td>
<td>0.73**</td>
<td>0.46</td>
</tr>
<tr>
<td>Theme VI</td>
<td>1</td>
<td>52.6</td>
<td>0.49**</td>
<td>0.31</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>2</td>
<td>57.7</td>
<td>0.50**</td>
<td>0.33</td>
</tr>
<tr>
<td>Theme VII</td>
<td>1</td>
<td>88.2</td>
<td>0.53**</td>
<td>0.36</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>3</td>
<td>49.7</td>
<td>0.50**</td>
<td>0.30</td>
</tr>
<tr>
<td>Theme VIII</td>
<td>2</td>
<td>70.1</td>
<td>0.66**</td>
<td>0.51</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>3</td>
<td>89.1</td>
<td>0.61**</td>
<td>0.47</td>
</tr>
<tr>
<td>Theme IX</td>
<td>1</td>
<td>76.7</td>
<td>0.55**</td>
<td>0.46</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>3</td>
<td>49.7</td>
<td>0.48**</td>
<td>0.32</td>
</tr>
<tr>
<td>Theme X</td>
<td>2</td>
<td>51.1</td>
<td>0.48**</td>
<td>0.35</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>5</td>
<td>45.6</td>
<td>0.52**</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Note: **P < 0.01.

### Table 3

<table>
<thead>
<tr>
<th>Theme</th>
<th>Number of item</th>
<th>Percentage of correct answer (%)</th>
<th>Cronbach’s α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etiology &amp; development</td>
<td>6</td>
<td>65.2</td>
<td>0.804</td>
</tr>
<tr>
<td>Classification &amp; observation</td>
<td>5</td>
<td>73.3</td>
<td>0.691</td>
</tr>
<tr>
<td>Risk</td>
<td>3</td>
<td>91.0</td>
<td>0.581</td>
</tr>
<tr>
<td>Nutrition</td>
<td>2</td>
<td>92.9</td>
<td>0.426</td>
</tr>
<tr>
<td>Reduction of the amount of pressure/shear</td>
<td>7</td>
<td>58.3</td>
<td>0.802</td>
</tr>
<tr>
<td>Duration of pressure/shear</td>
<td>5</td>
<td>62.4</td>
<td>0.723</td>
</tr>
<tr>
<td>Overall instrument</td>
<td>28</td>
<td>73.9</td>
<td>0.792</td>
</tr>
</tbody>
</table>

Note: **P < 0.01.
was retained because “it makes it possible to emphasize the limited evidence about the relation between nutrition and pressure ulcer prevention”. Additionally, the 0.03 item difficulty value is still within the acceptable range because Feldt indicated that items with difficulties close to or above 0.95 fail to differentiate between respondents. Cronbach’s α were used in the present study to estimate the reliabilities of the total instrument and each sub-theme. The IAPKUP yielded an overall Cronbach’s α of 0.792, and these values for the six sub-themes ranged from 0.426 to 0.804. The lowest internal consistency was observed for the nutrition theme (Cronbach’s α = 0.426), and the highest was observed for the etiology & development theme (Cronbach’s α = 0.804). These results can be explained by using Beeckman and colleagues’ idea that the “Cronbach’s α was dependent not only on the magnitude of the correlations among items but also on the number of items in the scale”. The nutrition theme had fewer items than the other five themes, which might be an explanation for this low correlation coefficient.

Therefore, caution should be exercised regarding the claim that the nutrition theme exhibited satisfactory internal consistency.

5. Conclusions

This study represents the first trial that translated and modified an existing instrument that measures the knowledge of pressure ulcers for a Chinese Mainland sample. The findings from the study indicate that this Chinese version of the instrument has acceptable psychometric properties and can be applied in the Chinese population. Further studies may be needed to evaluate the applicability of the modified version to other Asian language-speaking populations and English-speaking populations.

Conflicts of interest

All contributing authors declare no conflicts of interest.

Appendix A. Final instrument

<table>
<thead>
<tr>
<th>Theme 1: Aetiology and development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Which statement is correct?</td>
</tr>
<tr>
<td>a. Malnutrition causes pressure ulcers.</td>
</tr>
<tr>
<td>b. A lack of oxygen causes pressure ulcers.*</td>
</tr>
<tr>
<td>c. Moisture causes pressure ulcers.</td>
</tr>
<tr>
<td>2 Extremely thin patients are more at risk of developing a pressure ulcer than obese patients.</td>
</tr>
<tr>
<td>a. Correct. The contact area involved is small and thus the amount of pressure is higher.*</td>
</tr>
<tr>
<td>b. Incorrect. The pressure is less extensive because the body weight of those patients is lower than the body weight of obese patients.</td>
</tr>
<tr>
<td>c. Incorrect. The risk of developing a vascular disorder is higher for obese patients. This increases the risk of developing a pressure ulcer.</td>
</tr>
<tr>
<td>3 What happens when a patient, sitting in bed in a semi-upright position (60°), slides down?</td>
</tr>
<tr>
<td>a. Pressure increases when the skin sticks to the surface.</td>
</tr>
<tr>
<td>b. Friction increases when the skin sticks to the surface.</td>
</tr>
<tr>
<td>c. Shearing increases when the skin sticks to the surface.*</td>
</tr>
<tr>
<td>4 Which statement is correct?</td>
</tr>
<tr>
<td>a. Soap can dehydrate skin and thus the risk of pressure ulcers is increased.</td>
</tr>
<tr>
<td>b. Moisture from urine, faeces, or wound drainage causes pressure ulcers.</td>
</tr>
<tr>
<td>c. Shear is the force which occurs when the body slides and the skin sticks to the surface.*</td>
</tr>
<tr>
<td>5 Which statement is correct?</td>
</tr>
<tr>
<td>a. Recent weight loss which has brought a patient below his or her ideal weight, increases the risk of pressure ulcers.*</td>
</tr>
<tr>
<td>b. Very obese patients using medication that decreases the peripheral blood circulation are not at risk of developing pressure ulcers.</td>
</tr>
<tr>
<td>c. Poor nutrition and age have no impact on tissue tolerance when the patient has a normal weight.</td>
</tr>
<tr>
<td>6 There is NO relationship between pressure ulcer risk and:</td>
</tr>
<tr>
<td>a. Age</td>
</tr>
<tr>
<td>b. Dehydration</td>
</tr>
<tr>
<td>c. Hypertension*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Theme 2: Classification and observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Which statement is correct?</td>
</tr>
<tr>
<td>a. A pressure ulcer extending down to the fascia is a grade 3 pressure ulcer.*</td>
</tr>
<tr>
<td>b. A pressure ulcer extending through the underlying fascia is a grade 3 pressure ulcer.</td>
</tr>
<tr>
<td>c. A grade 3 pressure ulcer is always preceded by a grade 2 pressure ulcer.</td>
</tr>
<tr>
<td>2 Which statement is correct?</td>
</tr>
<tr>
<td>a. A blister on a patient’s heel is always a pressure ulcer of grade 2.</td>
</tr>
<tr>
<td>b. All grades (1,2,3, and 4) of pressure ulcers involve loss of skin layers.</td>
</tr>
<tr>
<td>c. When necrosis occurs, it is a grade 3 or a grade 4 pressure ulcer.*</td>
</tr>
<tr>
<td>3 Which statement is correct?</td>
</tr>
<tr>
<td>a. Friction or shear may occur when moving a patient in bed.*</td>
</tr>
<tr>
<td>b. A superficial lesion, preceded by non-blanchable erythema is probably a friction lesion.</td>
</tr>
<tr>
<td>c. A kissing ulcer (copy lesion) is caused by pressure and shear.</td>
</tr>
<tr>
<td>4 In a sitting position, pressure ulcers are most likely to develop on:</td>
</tr>
<tr>
<td>a. Pelvic area, elbow and heel.*</td>
</tr>
<tr>
<td>b. Knee, ankle and hip.</td>
</tr>
<tr>
<td>c. Hip, shoulder and heel.</td>
</tr>
<tr>
<td>5 Which statement is correct?</td>
</tr>
<tr>
<td>a. All patients at risk of pressure ulcers should have a systematic skin inspection once a week.</td>
</tr>
<tr>
<td>b. The skin of patients seated in a chair, who cannot move themselves, should be inspected every two or 3 h.</td>
</tr>
<tr>
<td>c. The heels of patients who lie on a pressure redistributing surface should be observed minimum a day.*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Theme 3: Risk assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Which statement is correct?</td>
</tr>
<tr>
<td>a. Risk assessment tools identify all high risk patients in need of prevention.</td>
</tr>
<tr>
<td>b. The use of risk assessment scales reduces the cost of prevention.</td>
</tr>
</tbody>
</table>

(continued on next page)
Theme 6: Preventive measures to reduce the duration of pressure/shear

2. Which statement is correct?
   a. The risk of pressure ulcer development should be assessed daily in all nursing home patients.
   b. Absorbing pads should be placed under the patient to minimize the risk of pressure ulcer development.
   c. A patient with a history of pressure ulcers runs a higher risk of developing new pressure ulcers.*

3. When assessing a patient’s likelihood of development a pressure ulcer the nurse should:*
   a. Seek advice form a specialist.
   b. Use an evidence based assessment tool together with own clinical judgment.*
   c. Use an evidence based assessment tool.

Theme 4: Nutrition

1. Which statement is correct?
   a. Malnutrition causes pressure ulcers.
   b. The use of nutritional supplements can replace expensive preventive measures.
   c. Optimizing nutrition can improve the patients’ general physical condition which may contribute to a reduction of the risk of pressure ulcers.*

2. Which statement is correct?#
   a. Nutrition is an uncontrollable factor of pressure ulcer development.
   b. Optimal level of albumin contributes to pressure ulcers’ healing and decreasing rates of infection.*
   c. Hydration contributes nothing to pressure ulcers’ healing

Theme 5: Preventive measures to reduce the amount of pressure/shear

1. Which preventive methods can be used to reduce pressure ulcer risk the most?*
   a. Preventive measures.
   b. Nutritional supplements.
   c. Nutritional supplements can be used to reduce pressure ulcer risk the most.

2. Which statement is correct?
   a. Patients who are able to change position while sitting should be taught to shift their weight minimum every 60 min while sitting in a chair.
   b. In a side lying position, the patient should be at a 90° angle with the bed.
   c. Shearing forces affect a patient’s sacrum maximally when the head of the bed is positioned at 30°.

4. If a patient is sliding down in a chair, the magnitude of pressure at the seat can be reduced the most by:
   a. A thick air cushion.*
   b. A donut shaped foam cushion.
   c. A gel cushion.

5. For a patient at risk of developing a pressure ulcer, a visco-elastic foam mattress ...
   a. Reduces the pressure sufficiently and does not need to be combined with repositioning.
   b. Has to be combined with repositioning every 2 h.
   c. Has to be combined with repositioning every 4 h*

6. A disadvantage of a water mattress is:
   a. Shear at the buttocks increases.
   b. Pressure at the heels increases.
   c. Spontaneous small body movements are reduced.*

7. When a patient is lying on a pressure reducing foam mattress ...
   a. Elevation of the heels is not necessary.
   b. Elevation of the heels is important.*
   c. He or she should be checked for “bottoming out” at least twice a day.

Theme 6: Preventive measures to reduce the duration of pressure/shear

1. Repositioning is an accurate preventive method because ...
   a. The magnitude of pressure and shear will be reduced.
   b. The duration of pressure and shear will be reduced.
   c. The duration of pressure and shear will be reduced.*

2. Fewer patients will develop a pressure ulcer if ...
   a. Food supplements are provided.
   b. The areas at risk are massaged.
   c. Patients are mobilized.*

3. Which statement is correct?
   a. Patients at risk lying on a non pressure reducing foam mattress should be repositioned every 2 h*
   b. Patients at risk lying on an alternating air mattress should be repositioned every 4 h.
   c. Patients at risk lying on a visco – elastic foam mattress should be repositioned every 2 h.

4. When a patient is lying on an alternating pressure air mattress, the prevention of heel pressure ulcers includes:
   a. No specific preventive measures.
   b. A pressure reducing cushion under the heels.
   c. A cushion under the lower legs elevating the heels.*

5. If a bedridden patient cannot be repositioned, the most appropriate pressure ulcer prevention is:
   a. A pressure redistributing foam mattress.
   b. An alternating pressure air mattress.*
   c. Local treatment of the risk areas with zinc oxide paste.

* indicates the correct answer.
# indicates newly added question.
附件 2 量表中文版

主题 I：压疮病因与发展过程

1. 请选出一项正确的描述：
   a) 营养失调会导致压疮
   b) 缺氧会导致压疮
   c) 潮湿会导致压疮

2. 过瘦的病人比肥胖的病人更容易产生压疮。
   a) 正确，因体表接触面积较小所以承受的压力更大*
   b) 不正确，由于过瘦的病人体重比肥胖病人轻，所以承受的压力比较少
   c) 不正确，因为肥胖的病人较易发生血管疾病，发生压疮的危险性也随之增加

3. 当于床上呈半坐卧位（60°）的病人滑下时，会出现：
   a) 当皮肤与床表面接触时，压力增加
   b) 当皮肤与床表面接触时，摩擦力增加
   c) 当皮肤与床表面接触时，剪切力增加*

4. 请选出一项正确的描述：
   a) 肥皂会使皮肤干燥，进而增加（发生）压疮的风险
   b) 尿液、粪便及伤口引流所造成的潮湿会导致压疮
   c) 「剪切力」是身体滑动时，皮肤与床表面接触所产生的力*

5. 请选出一项正确的描述：
   a) 近期体重降低并低于理想体重的病人，发生压疮的风险也随之增加*
   b) 正在使用药物控制周围血液循环的肥胖病人，不容易发生压疮
   c) 正常体重的病人，营养不良和年龄的因素对组织的耐受力没有影响

6. 下列何项与压疮无关：
   a) 年龄
   b) 脱水
   c) 高血压*

主题 II：压疮分类与观察

1. 请选出一项正确的描述：
   a) 第一期压疮是指侵犯到真皮层的压疮*
   b) 第二期压疮是指已穿过真皮层的压疮
   c) 第二期压疮通常会进展为第三期压疮

2. 请选出一项正确的描述：
   a) 足跟处出现水泡，皆为第二期压疮
   b) 所有压疮（第 I 至 IV 期）均有皮肤破损
   c) 当皮肤出现坏死时，已是第三期或第四期压疮*

3. 请选出一项正确的描述：
   a) 当移动床上的病人时，可能产生摩擦力或剪切力*
   b) 由指压时不会消失的红斑演变成的表皮破损可能是由于摩擦力所造成的损伤
   c) 对称性溃疡（又称“单纯溃疡”）是由压力及剪切力造成的

4. 采取坐位时，最容易发生压疮的部位是：
   a) 骶骨部位、肘及足跟*
   b) 膝盖、脚踝及臀部
   c) 臀部、肩膀和足跟

5. 请选出一项正确的描述：
   a) 对发生压疮的高危病人，应每周进行一次系统性皮肤评估
   b) 对坐在椅子上无法自行活动的病人，应每 2-3 小时评估皮肤 1 次
   c) 对使用减压床的卧床病人，至少每天要评估其足跟 1 次*
主题 III：压疮风险评估

1. 请选出一项正确的描述：
   a) 压疮风险评估量表能确认所有需要采取预防措施的高危病人
   b) 运用压疮风险评估量表能减少压疮预防措施的开支
   c) 压疮风险评估量表，需与临床判断相互结合，才能准确地预测发生压疮的风险

2. 请选出一项正确的描述：
   a) 对住护理院的病人，应每天为其做压疮评估
   b) 躺在病床上应该放置吸水垫，以减少发生压疮的风险
   c) 有溃疡的病人更容易发生新的压疮

3. 当评估患者发生压疮的可能性时，护士应该：
   a) 咨询压疮护理方面的专家
   b) 将评估量表的依据与自己的临床判断相结合
   c) 采用评估量表作为依据

主题 IV：营养方面

1. 请选出一项正确的描述：
   a) 营养不良会造成压疮
   b) 使用营养补充品能取代昂贵的预防措施
   c) 加强营养能改善病人的健康状况，进而减少发生压疮的风险

2. 请选出一项正确的描述：
   a) 营养状态是压疮发生的不可控制因素
   b) 最佳的蛋白质水平有助于压疮的愈合并降低感染的发生
   c) 补充水分对压疮愈合没有作用

主题 V：减少压力/剪切力的预防措施

1. 使身体承受最小剪切力的坐姿是：
   a) 直立坐姿，双脚放在脚蹬上
   b) 直立坐姿，双脚放在地上的
   c) 后靠坐姿，双脚放在脚凳上

2. 下列最能减少压疮风险的体位变换措施是：
   a) 仰卧位 - 90°侧卧位 - 90°侧卧位 - 仰卧位
   b) 仰卧位 - 30°侧卧位 - 30°侧卧位 - 仰卧位
   c) 仰卧位 - 30°侧卧位 - 坐位 - 30°侧卧位 - 仰卧位

3. 请选出一项正确的描述：
   a) 指导能自行变换体位的坐姿病人，坐在椅子期间应至少每 60 分钟移动重量支撑点 1 次
   b) 当采取侧卧位时，病人身体应与床面成 90°度角
   c) 当床头抬高 30°时，剪切力对病人膝部影响最大

4. 当病人在坐椅上向下滑动时，何项最能减低压力的强度：
   a) 厚的空气垫
   b) 环形的泡沫坐垫
   c) 胶质坐垫

5. 对于有罹患压疮风险的病人，使用泡沫海绵床(也叫“高密度海绵床垫”)
   棕床：
   a) 能有效地减少压力，并不需要更换体位
   b) 仍需每 2 小时更换体位 1 次
   c) 仍需每 4 小时更换体位 1 次
6. 使用水床的缺点是:
   a) 增加臀部的剪切力
   b) 增加足跟部的压力
   c) 降低身体微细的自主运(动)*
7. 当病人处于减压海绵床垫时:
   a) 不需要抬高足跟部
   b) 抬高足跟部很重要*
   c) 每天至少检查两次病人是否已下陷到床垫的底部

主题VI: 减少压力剪切力持续时间的预防措施

1. 更换体位是一种正确的预防方法，因为:
   a) 能减少压力和剪切力的强度
   b) 能减少压力和剪切力的总量及持续时间
   c) 能减少压力和剪切力的持续时间*

2. 下列哪项能减少压疮的发生:
   a) 提供充足营养
   b) 按摩高危部位
   c) 鼓励病人多活动*

3. 请选出一项正确的描述:
   a) 使用非减压型泡沫床的病人应每 2 小时更换体位
   b) 使用气压交换床垫的病人应每 4 小时更换体位*
   c) 使用太空记忆泡沫床的病人应每 2 小时更换体位 1 次

4. 当病人躺在气垫床上时，预防足跟发生压疮的措施包括:
   a) 无需特定的预防措施
   b) 在足跟下放置减压软垫
   c) 下肢放置软垫用来抬高足跟*

5. 卧床病人无法自行更换体位时，预防压疮最适当的措施是:
   a) 使用减压海绵床垫
   b) 使用气压交换床垫*
   c) 局部涂抹氧化锌药膏于好发部位

注：# 为新问题
   * 为旧问题

References