Psychometric validation of the Korean Pressure Ulcer Knowledge Assessment Tool

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Introduction

The purpose of this study was to evaluate the psychometric properties, including content validity, validity of multiple choice items, and the reliability of the Korean version of the Pressure Ulcer Knowledge Assessment Tool (K-PUKAT 2.0), using classical test theory (CTT) and item response theory (IRT).

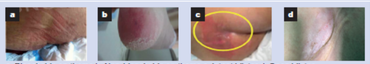
Method

Linguistic validation process and factor analysis were conducted among wound care nurses, staff nurses and nursing students. Items were analysed according to the CTT and IRT using a two-parameter logistic model. Intraclass correlation coefficients were used to examine reliability.

Result

A total of 378 wound care nurses, staff nurses and nursing students participated in this study. While most items showed moderate

difficulty based on the CTT, difficulty index values based on the IRT were more broadly distributed (low: 5 items; moderate: 9 items; high: 1 item). The intraclass correlation coefficient for K-PUKAT 2.0 was 0.72.

Theme 1: Aetiology	
1. The use of a ring cushion (donuts) is effective to prevent pressure ulcers when patients are seated in a chair or wheelchair. Is this statement correct?	a. Yes, because the pressure near the bony prominence is reduced b. Yes, because it redistributes pressure and shear effectively around the area at risk c. No, because the contact surface between the patient's skin and the surface is smaller d. No, as it is only effective if a patient had a pressure ulcer in the past e. I don't know the answer
2. A patient sits with the head of bed elevated to 60°. What happens when his skin sticks to the underlying surface when he slides down in bed?	a. The pressure increases b. Problems with the microclimate occur (temperature and relative humidity) c. Shear increases d. Friction/rubbing increases e. I don't know the answer
3. Which statement is correct?	a. The use of moisture-absorbing pads decreases the risk of pressure ulcers b. The use of water and soap can erode the skin barrier, thereby increasing the risk of superficial skin damage c. Massaging the skin (during washing and drying) is effective to prevent pressure ulcers d. Dressing the heels (with a bandage) will decrease the risk of heel pressure ulcer development e. I don't know the answer
Theme 2: Assessment and observation	
4. Which of these statements about the frequency of skin assessment on pressure points in hospitals is correct?	a. The frequency of skin assessment is a medical decision (made by a medical doctor) b. Skin areas with an increased risk for pressure ulcer development should be inspected at least once a week c. The skin of patients at risk should be inspected at least twice a week d. The skin of all patients should be inspected at least daily e. I don't know the answer
5. **Case:** The nurse observes a bony structure in a wound. In which category can you classify this pressure ulcer?	a. Category 4 b. Category 3 c. Category 2 d. Category 1 e. I don't know the answer
6. Which repositioning protocol is most effective to prevent pressure ulcers? Starting with the patient supine, then…	a. Lateral 30° left – supine-lateral 30° right – supine-lateral 30° left b. Lateral 90° left – supine-lateral 90° right – supine-lateral 90° left c. Lateral 30° left – supine-lateral 30° right – supine-lateral 90° left – supine-lateral 90° right d. Lateral 30° left – lateral 90° left – supine-lateral 30° right – lateral 90° right – supine e. I don't know the answer
Theme 3: Classification and equipment	
7. In which of these categories can necrotic tissue be present?	a. Category 1, 2, 3 and 4 b. Category 2, 3 and 4 c. Category 3 and 4 d. Category 1 and 4 e. I don't know the answer
8. Which of these pictures is a pressure ulcer category 1?	 a. Blanchable erythema b. Non-blanchable erythema c. Intact blister d. Open blister e. I don't know the answer
9. **Case:** Your patient is lying on a pressure-redistributing foam mattress. Do you take other measures to prevent pressure ulcers on the heels?	a. No. A pressure redistributing foam mattress is sufficient b. No. A pressure redistributing foam mattress combined with repositioning is sufficient c. Yes. I will place a pillow from the knee to the Achilles tendon to offload the heels d. Yes. I will place a pillow under the Achilles tendon to offload the heels e. I don't know the answer
Theme 4: Risk factor and location	

Theme 4: Risk factor and location (continued)	
11. Which is the location on the body where babies have the highest risk to develop a pressure ulcer?	a. Occiput b. Heels c. Shoulders d. Sacrum e. I don't know the answer
Theme 5: Immobilisation	
12. **Case**: A patient is sitting in a chair in the morning and in the afternoon, each time for 2 hours. The rest of the day he spends in bed. He cannot mobilise himself. When does this patient have the highest risk to develop a pressure ulcer (if no prevention is applied)?	a. There is no higher risk to develop a pressure ulcer if a seated position in chair is combined with a lying position in bed b. The risk to develop a pressure ulcer is highest when he is seated in a chair because high pressure is applied during a short period of time c. The risk to develop a pressure ulcer is highest when he is lying in bed because lower pressure is applied during a longer period of time d. The risk to develop a pressure ulcer is high in this specific case, both when seated in a chair and lying in bed. A short-term high pressure can have the same effect as a long-term low pressure e. I don't know the answer
13. **Case:** Your colleague informs you that she positioned a patient in bed in a semi-Fowler's position. What does this mean?	a. The patient lies on his side in an angle of 30° b. The patient lies on his side in an angle of 45° c. The patient lies in a supine position, with both head of bed and upper legs elevated up to an angle of 30° d. The patient lies in a supine position, with the head of bed elevated up to an angle of 45° e. I don't know the answer
Theme 6: Vulnerability	
14. What type of patients (in terms of body weight) have an increased risk to develop pressure ulcers?	a. Extremely thin patients b. Obese patients c. Both extremely thin and obese patients d. Body weight and body mass index (BMI) are not associated with pressure ulcer risk e. I don't know the answer
15. Which of these statements is correct about the development of pressure ulcers in the operating room? I-CVI = 1.00 S-CVI = 1.00	a. Pressure ulcers are not likely to occur during surgery. If redness is observed just after surgery. It is most likely to be a burn wound b. Immobilisation after surgery causes pressure ulcers to develop, not the immobilisation during the surgery itself c. When pressure ulcers develop during surgery the first visible signs appear a few days later; making people think they developed after surgery d. A pressure ulcer appearing postoperatively is always the result of immobilisation during surgery e. I don't know the answer

I-CVI—item-level content validity index; S-CVI—scale-level content validity index

Conclusion

The K-PUKAT 2.0 demonstrated concise and good psychometric properties. Based on the results of this study, repetitive use of K-PUKAT 2.0 will not only help in distinguishing whether an individual has sufficient clinical knowledge, but will also play a key role in supporting learning.