The Swedish version of the attitude towards pressure ulcer prevention instrument for use in an operating room context (APUP-OR): A nationwide psychometric evaluation

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ABSTRACT

Introduction: To assess operating room (OR) nurses’ attitudes towards pressure ulcer prevention, the Attitude towards Pressure Ulcer Prevention (APuP) instrument was developed.

Aim: The aim of this study was to psychometrically evaluate the Attitude towards Pressure Ulcer Prevention (APuP) instrument in a Swedish OR context.

Materials and methods: A psychometric evaluation study was conducted, using a convenience sample, between February and August 2020. Validity (content, construct, discriminatory power) and reliability (stability and internal consistency) were evaluated.

Results: The first survey (test) was completed by 284 Swedish OR nurses, of whom n = 50 (17.6%) completed the second survey (retest). A Principal Component Analysis was conducted for the 13-item instrument. The KMO value for this model was 0.62. Bartlett’s test for sphericity was statistically significant (p = 0.001). Five factors were identified which accounted for 56% of the variance in responses related to attitudes towards pressure ulcer prevention. The Cronbach’s α for the instrument “attitude towards Pressure Ulcer Prevention” was 0.66. The intraclass correlation coefficient was 0.49 (95% CI = 0.25–0.67).

Conclusion: This Swedish version of the APuP-OR is the first step in the development of an instrument to measure OR nurses’ attitudes towards PU prevention in a Swedish OR context. The reliability of the instrument was low and the validity moderate. A larger sample and the revision or addition of items related to the context of the operating room should be considered in order to confirm aspects of the psychometric properties.

1. Introduction

Pressure ulcers (PU) are a common but largely preventable condition in hospitalised surgical patients [1]. The National Pressure Injury Advisory Panel (NPIAP) reports that pressure ulcers in the operating room (OR) occur in 4%–45% of patients admitted to the hospital [2]. Studies found prevalence rates of pressure ulcers of 8.8% or higher in surgical patients [4–6]. It is not possible to reposition the patient during surgery, and surgical positioning can lead to local concentrations of stress and deformation in the soft tissues. Surgical positioning combined with the use of surgical instruments (scalpels and retractors) and life support devices (endotracheal tubes and intravenous lines), which may cause localised compressive and shear forces on the body surface, result in a decrease in tissue perfusion. Anaesthetics and sedatives used in surgery are also associated with a higher PU incidence because they lower blood pressure and cause hypoperfusion, which affects tissue metabolism and pain response [7]. During recovery from surgery, surgical patients are at high risk for the development of PUs due to their...
immobility and impaired sensation [8,9]. Pressure ulcers are associated with patient suffering, reduced quality of life and increased healthcare costs (at patient and societal level). Prevention is needed [10].

Work in the OR department is highly specialized, with different professional groups working together in teams. All team members have different priorities and goals that need to be considered. OR Nurses play a key role in ensuring patient safety, including PU care. To assess, prevent and/or treat patients for PU, knowledge and skills are essential [11]. Higher levels of education, responsibility, and experience may be reflected in differences in knowledge and attitude. Despite the contradictory results of the relationship between knowledge and attitudes in PU prevention [12-14], research confirms that nurses’ attitudes influence adherence to PU prevention strategies, and that nurses’ knowledge influences their perceptions of the need for and importance of PU prevention [12-15]. An attitude may be defined as a summary evaluation of an object of thought [16]. It consists of feelings and beliefs that influence decisions and guides the behaviour of individuals [17]. Identifying and understanding nurses’ attitudes towards pressure care can reveal their beliefs and behaviours about PU prevention and risk assessment [18,19], which may affect the PU preventive practices in the OR [11,19].

To assess attitudes towards PU prevention, the Attitude towards Pressure Ulcer Prevention (APuP) instrument was developed [20]. The APuP is a questionnaire developed to measure nurses’ attitudes toward PU prevention. The original version of the APuP contains a short multiple-choice questionnaire consisting of five factors: personal competence to prevent PU (3 items), priority of PU prevention (3 items), impact of PU (3 items), responsibility for PU prevention (2 items), and confidence in the effectiveness of prevention (2 items). Each item is scored on a 4-point Likert scale. Total scores range from 13 to 52. The Cronbach’s alpha of the instrument at the time of its development was 0.79 [20]. The APuP instrument has been evaluated in several cultural contexts [21,22] and it has been translated from English into Swedish [21]. However, the instrument has yet to be validated in a Swedish context with OR nurses.

2. Aim

The aim of this study was to psychometrically evaluate the Attitude towards Pressure Ulcer Prevention (APuP) instrument in a Swedish OR context.

3. Method

3.1. Study design

A nationwide psychometric evaluation study of the Swedish version of the Attitudes towards Pressure Ulcer Prevention (APuP) instrument was undertaken in 2020. Validity (construct, discriminatory power) and reliability (stability and internal consistency) were evaluated in a convenience sample of Swedish OR nurses.

3.2. Sample and procedure

An online questionnaire was developed using LimeSurvey™ software. The survey included information on the procedure and confidentiality, demographic questions, and the skin tear knowledge assessment instrument. All county councils in Sweden (n = 21) were asked to provide the e-mail addresses of all active OR nurses in Sweden so that the researchers could ask them to participate in the study. Of the approximately 4000 OR nurses registered in Sweden, the questionnaire was sent to the 2247 OR nurses on the list who could be reached and who agreed to participate in the study. After one week, a reminder was sent to the participants. Data were collected between August and September 2020. To assess test-retest reliability, the questionnaire was sent twice to the same group of OR nurses. The testing interval was one week. To assign both questionnaires to the same OR nurse, OR nurses were required to provide a unique identification number consisting of the last two digits of their computer number and zip code. Before the survey was closed, a reminder email was sent.

3.3. Ethical considerations

The study was approved by the Ethics Review Board in Linköping (Sweden). The registration number was 2020-01212. The participant information sheet and a link to the survey were sent as an e-mail. Informed consent was taken from the participants when returning the questionnaire. The confidentiality of the participants was guaranteed, and the data were kept confidential in separate data files on the servers of Ghent University, protected by firewalls, in accordance with Swedish Law of Personal Data Protection (GDPR).

4. Data analysis

Statistical analyses were performed using the software package IBM SPSS v24.0 (SPSS Inc., Chicago, IL, USA). A significance level of 0.05 was used for all statistical tests. A sample size calculation was not performed.

4.1. Analysis of APuP

4.1.1. Construct validity

Construct validity was evaluated by (1) factor analysis using principal component analysis and (2) discriminant power (known-groups technique).

Varimax rotation with Kaiser normalisation was used in factor analysis. The number of factors was determined by eigenvalues (>1). The Kaiser-Meyer-Olkin (KMO) measure of Sampling Adequacy above 0.50, Bartlett’s test for sphericity, Scree plot, factor loadings above 0.40, and explainable variance proportions (at least 5% reported variance per factor) were evaluated [23].

For the final model, analyses of discriminatory power, internal consistency, and stable reliability were performed.

Discriminant power was assessed using the known groups technique to evaluate the ability of the instrument to discriminate between groups with theoretically expected different levels of attitude toward pressure ulcers [24-26]. The following theoretical differences between the following groups were to be expected:

- Operating room nurses without leadership roles have more negative attitudes toward PU prevention than OR nurses with leadership roles.
- Nurses with a bachelor’s or professional degree have more negative attitudes toward PU prevention than nurses with a master’s degree.
- Nurses with a professional degree have more negative attitudes toward PU prevention than nurses with a bachelor’s degree.
- Nurses without professional training have more negative attitudes than nurses with professional training.
- Nurses with ten years or less experience have more negative attitudes than nurses with more than ten years of experience.
- Nurses who indicated that PU training could be useful have more positive attitudes than nurses who indicate that PU training is not useful.

The scores for the negatively worded items were reversed. Total scores for attitude and total scores for areas received were calculated with sum scores. The independent samples t-test was used to detect differences between the attitude scores of the predefined groups [25].

4.1.2. Reliability (intraclass correlation)

Internal consistency was assessed by calculating Cronbach’s α inter-item correlations using a two-way random model [24]. Results were interpreted using the Streiner and Norman (2015) criteria for
Cronbach’s α (0.70 < Cronbach’s α < 0.90) [27]. The test-retest procedure was used to assess the stable reliability of the instrument. The intraclass correlation coefficients (ICC) were calculated for each domain using a two-way random model. Reliability coefficients ≥0.70 were considered satisfactory and coefficients ≥0.80 were considered preferable [25].

5. Results

5.1. Participant characteristics

A total of 284 participants [93.0% female, age (mean ± SD) 48.2 ± 9.4 years] completed the first survey (test), of whom 50 (17.6%) also completed the second survey (retest). Most participants were OR non-managerial nurses (94.0%), and 63.4% had more than 10 years of professional experience. More than half of the participants (64.1%) had a bachelor’s degree or higher and rated their expertise in pressure ulcers as competent or higher (61.3%). Of all participants, 247 (87.0%) nurses would find PU training useful. A summary of the sample demographics is presented in Table 1.

5.2. Psychometric evaluation of the APuP instrument

5.2.1. Construct validity

Factor analysis. A principal component analysis was conducted for a 13-item instrument. The model chosen included five factors covering the 13 items. The KMO value for this model was 0.62. Bartlett’s test for sphericity was statistically significant ($\chi^2 = 371.724, \text{df} = 78, p = 0.001$). Factors were defined as follows:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Attitude towards personal competence to prevent pressure ulcers.</td>
</tr>
<tr>
<td>2.</td>
<td>Attitude towards the priority of pressure ulcer prevention.</td>
</tr>
<tr>
<td>3.</td>
<td>Attitude towards the impact of pressure ulcers.</td>
</tr>
<tr>
<td>4.</td>
<td>Attitude towards confidence in the effectiveness of prevention.</td>
</tr>
<tr>
<td>5.</td>
<td>Attitude toward responsibility in pressure ulcer prevention.</td>
</tr>
</tbody>
</table>

Factor analysis using principal component analysis is shown in Table 2.

5.2.2. Discriminating power

For two groups, the group scores of participants with a theoretically expected more positive attitude were significantly higher than those of participants with a theoretically expected more negative attitude. Nurses with a master’s degree were found to have more positive attitudes than nurses with only a bachelor’s degree (mean difference = 1.23; 95% CI = 0.61–3.05) and were more positive than nurses with a professional degree [EQ (F5)] [28] (mean difference = 0.14; 95% CI = –0.76–1.04) (see Table 3).

For two groups, the group scores of participants with theoretically expected more positive attitudes were significantly lower than those of participants with theoretically expected more negative attitudes. Nurses with ten years or less of professional experience were found to have more positive attitudes than nurses with more than ten years of professional experience (mean difference: 1.2; 95% CI = 0.29–2.08) (see Table 3). Non-expert nurses showed more positive attitudes than expert nurses (respectively, mean difference = –1.23; 95% CI = 0.36–80) (see Table 3). No significant differences in attitudes were found between OR nurses with or without leadership roles, between nurses with professional and bachelor’s degrees, and between nurses who would or would not find PU training useful.

5.2.3. Internal consistency

The Cronbach’s α for the domains of the APuP-OR instrument ranged from 0.25 to 0.67. (see Table 4).

5.2.4. Stability reliability (intraclass correlation)

A total of 50 nurses completed the instrument twice with a 1-week interval between administrations. A total of 78 questionnaires could not be linked to the first survey because of a problem in matching and comparing identification numbers. The ICCs for the domains varied from 0.14 (95% CI = 0.0–0.40) to 0.50 (95% CI = 0.27–0.69) (see Table 4). The final version of the APuP is shown in Table 5.

6. Discussion

All team members in the OR department have different priorities and goals that now need to be brought together [29]. OR Nurses play a key role in ensuring patient safety, including PU care [11,30,31]. Adherence to PU prevention strategies is influenced by nurses’ attitudes toward PU prevention [12–15]. Although the APuP instrument has been evaluated in various contexts [20–22], no psychometric evaluation has been conducted in a Swedish OR context.

The Swedish version of the APuP was the first step in developing a valuable instrument to measure OR nurses’ attitudes towards PU prevention. The results of the psychometric evaluation of the APuP-OR showed that the instrument and subscales had moderate validity and low reliability. Construct validity was acceptable, but if internal consistency had been higher, this would have further increased validity [32].

The KMO value, which was above 0.50, indicated that factor analysis could be performed. Factor analysis was used to identify the underlying relationships between items. The KMO value, which measures sampling adequacy, was just below the cut-off point of 0.70. Although this was below the cut-off point for acceptability, it might indicate a possible...
trend towards a possible relationship in which pairs of variables could be explained by other variables. A larger sample size would be needed to confirm this. Bartlett’s test for sphericity showed that the variables correlated with themselves and with other items [23]. The final model contained 13 items, all with factor loadings above 0.50. The five factors explained 56% of the variance in responses related to attitudes toward PU prevention. No items were removed from the original instrument [20,21].

The composition of the items deviated from the structure proposed by Beeckman et al. (2010) [20] which could be explained by differences in sample characteristics, cultural factors (such as the health care system, nursing education, nursing standards and policies), and among OR staff. In this version of the instrument, the item “I personally have an important role in PU prevention” (Q 2.2) and the item “The financial impact of pressure ulcers on society is high” (Q 2.3) were placed in the “priority” factor instead of the “responsibility” and “impact” factors. The item “Too much attention is paid to the prevention of pressure ulcers” was assigned to the factor “Impact” and the item “PU Prevention is not so important” to the factor “Responsibility” instead of the factor “Priority”. Restructuring of the items revealed that the original instrument may not be suitable for investigating attitudes towards PU prevention in a Swedish OR context [20,21].

Construct validity was also tested using the known-groups technique. The discriminant validity of the APuP was supported by the mean differences in attitudes by educational level, expertise, and work experience. Nurses with a master’s degree had more positive attitudes toward PU prevention compared with nurses with a bachelor’s or professional degree [EQ (F5)] [28]. This result may reflect differences in knowledge and attitudes due to higher levels of education, responsibility and experience. However, in a study comparing attitudes between different

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**Table 2**

Factor analysis using principal component analysis.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 Competence</th>
<th>Factor 2 Priority</th>
<th>Factor 3 Impact</th>
<th>Factor 4 Responsibility</th>
<th>Factor 5 Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am well trained to prevent pressure ulcers.</td>
<td>0.88</td>
<td>0.07</td>
<td>0.02</td>
<td>0.01</td>
<td>−0.02</td>
</tr>
<tr>
<td>2. I feel confident in my ability to prevent pressure ulcers.</td>
<td>0.85</td>
<td>0.06</td>
<td>0.06</td>
<td>0.13</td>
<td>−0.05</td>
</tr>
<tr>
<td>3. Pressure ulcer prevention should be a priority.</td>
<td>0.15</td>
<td>0.70</td>
<td>0.07</td>
<td>0.15</td>
<td>0.00</td>
</tr>
<tr>
<td>4. I personally have an important task in pressure ulcer prevention.</td>
<td>−0.10</td>
<td>0.70</td>
<td>0.17</td>
<td>0.04</td>
<td>−0.05</td>
</tr>
<tr>
<td>5. The financial impact of pressure ulcers on society is high.</td>
<td>0.01</td>
<td>0.70</td>
<td>−0.07</td>
<td>0.02</td>
<td>0.07</td>
</tr>
<tr>
<td>6. The financial impact of pressure ulcers on a patient should not be exaggerated.</td>
<td>−0.07</td>
<td>0.01</td>
<td>0.68</td>
<td>0.08</td>
<td>−0.18</td>
</tr>
<tr>
<td>7. Too much attention goes to the prevention of pressure ulcers.</td>
<td>0.1</td>
<td>0.24</td>
<td>0.63</td>
<td>−0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>8. Pressure ulcer prevention is too difficult. Others are better than me.</td>
<td>0.42</td>
<td>0.04</td>
<td>0.50</td>
<td>−0.12</td>
<td>0.11</td>
</tr>
<tr>
<td>9. A pressure ulcer almost never causes discomfort for a patient.</td>
<td>0.01</td>
<td>−0.17</td>
<td>0.47</td>
<td>0.32</td>
<td>0.26</td>
</tr>
<tr>
<td>10. Pressure ulcers are almost never preventable.</td>
<td>0.06</td>
<td>0.00</td>
<td>0.09</td>
<td>0.78</td>
<td>0.01</td>
</tr>
<tr>
<td>11. Pressure ulcers are preventable in high risk patients.</td>
<td>0.04</td>
<td>0.25</td>
<td>−0.04</td>
<td>0.75</td>
<td>−0.03</td>
</tr>
<tr>
<td>12. I am not responsible if a pressure ulcer develops in my patients.</td>
<td>0.09</td>
<td>0.00</td>
<td>0.24</td>
<td>0.21</td>
<td>−0.74</td>
</tr>
<tr>
<td>13. Pressure ulcer prevention is not that important.</td>
<td>0.04</td>
<td>0.04</td>
<td>0.24</td>
<td>0.19</td>
<td>0.63</td>
</tr>
</tbody>
</table>

(1) Student’s t-test.
(2) Degrees of freedom.
(3) Operation room.
(4) Self-estimated expertise in relation to the assessment and management of pressure ulcers (based on the levels of proficiency defined by Patricia Benner [1982]).

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**Table 3**

Known-groups technique APuP instrument.

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>Mean difference</th>
<th>95% CI</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR nurse vs. OR nurse with lead function</td>
<td>267</td>
<td>1.23</td>
<td>−0.61 −3.05</td>
<td>−1.41</td>
</tr>
<tr>
<td>vs. Bachelor’s degree (B)</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree (A)</td>
<td>75</td>
<td>0.14</td>
<td>−0.76 −1.04</td>
<td>−0.18</td>
</tr>
<tr>
<td>vs. Master’s degree (B)</td>
<td>105</td>
<td>1.02</td>
<td>0.14 −1.9</td>
<td>−2.50</td>
</tr>
<tr>
<td>Professional degree (A)</td>
<td>105</td>
<td>1.16</td>
<td>0.28 −2.03</td>
<td>−2.25</td>
</tr>
<tr>
<td>vs. Master’s degree (B)</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤10 years’ work experience (A)</td>
<td>104</td>
<td>1.2</td>
<td>0.29 −2.08</td>
<td>2.63</td>
</tr>
<tr>
<td>vs. &gt;10 years’ work experience (B)</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-expert (novice and competent) vs. Expert (proficient and expert)</td>
<td>110</td>
<td>1.51</td>
<td>0.36 −0.80</td>
<td>4.22</td>
</tr>
<tr>
<td>vs. Expert (proficient and expert) (B)</td>
<td>174</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure ulcer training could be useful (B)</td>
<td>247</td>
<td>0.16</td>
<td>−0.89 −1.22</td>
<td>−0.51</td>
</tr>
<tr>
<td>vs. Not useful (A)</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(A): Group with theoretically expected more negative attitude (B): Group with theoretically expected more positive attitude.

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**Table 4**

Internal consistency and stability reliability APuP instrument.

<table>
<thead>
<tr>
<th>Domains</th>
<th>Items</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency</td>
<td>1. I am well trained to prevent pressure ulcers</td>
<td>ICC (95% CI)</td>
</tr>
<tr>
<td></td>
<td>2. I feel confident in my ability to prevent pressure ulcers</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>3. Pressure ulcer prevention is too difficult. Others are better than me</td>
<td>0.06</td>
</tr>
<tr>
<td>Priority</td>
<td>4. Pressure ulcer prevention should be a priority</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>5. I personally have an important task in pressure ulcer prevention</td>
<td>0.28</td>
</tr>
<tr>
<td>Impact</td>
<td>7. The financial impact of pressure ulcers on a patient should not be exaggerated</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>8. Too much attention goes to the prevention of pressure ulcers</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>9. A pressure ulcer almost never causes discomfort for a patient</td>
<td>0.14</td>
</tr>
<tr>
<td>Responsibility</td>
<td>12. I am not responsible if a pressure ulcer develops in my patients</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>13. Pressure ulcer prevention is not that important</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Multiple statistical tests were performed to determine the consistency and reliability of the APuP questionnaire. The Cronbach’s alpha was calculated for each domain and the internal consistency reliability (ICC) for the domains was determined. The results showed that the APuP instrument is internally consistent and reliable. The Cronbach’s alpha values for the domains were 0.74–0.89, indicating acceptable internal consistency. The ICC values for the domains were 0.72–0.89, indicating good test–retest reliability. Therefore, the APuP instrument is suitable for use in future studies to assess the attitudes towards PU prevention among OR staff.

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(A): Independent sample t-test.
(B): Degrees of freedom.
(C): ICC (95% confidence interval).
(D): Cronbach’s alpha.

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The composition of the items deviated from the structure proposed by Beeckman et al. (2010) [20] which could be explained by differences in sample characteristics, cultural factors (such as the health care system, nursing education, nursing standards and policies), and among OR staff. In this version of the instrument, the item “I personally have an important role in PU prevention” (Q 2.2) and the item “The financial impact of pressure ulcers on society is high” (Q 2.3) were placed in the “priority” factor instead of the “responsibility” and “impact” factors. The item “Too much attention is paid to the prevention of pressure ulcers” was assigned to the factor “Impact” and the item “PU Prevention is not so important” to the factor “Responsibility” instead of the factor “Priority”. Restructuring of the items revealed that the original instrument may not be suitable for investigating attitudes towards PU prevention in a Swedish OR context [20,21].
The reliability of the instrument was assessed using the test-retest procedure. The overall ICC was 0.49, which is considered low. The ICCs per domain ranged from 0.14 to 0.50, which is considered very low. One possible reason for this could be the operational definitions of certain concepts, such as high-risk patients and financial impact. Nurses may interpret these terms differently. Therefore, the items may need to be revised. In addition, items could be included that relate to the context of the operating room, such as the concept of Medical Device-Related Pressure Ulcers (MDRPU). In addition to nurses’ attitudes and knowledge, organisational factors should also be considered, as these factors may also hinder or promote nurses’ attitudes and ability to perform optimally in the prevention of pressure ulcers [37].

The low response rate in the retest might have contributed to the width of the confidence interval, but also showed low similarity and stability in terms of the test and retest ICC. In addition, 78 questionnaires in the retest could not be linked to the first survey due to problems with identification numbers. In future research, securing a larger sample should be considered. Additionally, the use of a more reliable linkage method between test and retest questionnaires is needed.

### 6.1. Strengths/limitations

OR Nurses from across Sweden, representing eleven surgical specialties, participated in the study. However, the response rate was low which could lead to a smaller spectrum of opinions and consequently non-response bias [36]. An analysis of non-responders was not performed because of the study design. There are several possible reasons for the low response rate, one of which is the timing of the questionnaire mailing, which occurred during the Covid 19 pandemic. Another reason could be the functionality and design of the questionnaire invitation, which was made by attaching a link in an email. Despite the fact that computer-based surveys can reach a wide audience, response rates are generally lower compared with paper surveys [25]. A possible reason for this might be that they discourage participants who are unfamiliar with computer-based surveys. Attitude measurements may be unduly positive due to participants exhibiting social desirability bias.

Nevertheless, the APuP- OR is the first step in developing an instrument to measure OR nurses’ attitudes towards PU prevention in a Swedish OR context. The instrument may help to identify OR team members who have less positive attitudes, and once refined could be of help with the development and evaluation of future intervention strategies. Such refined interventions would be valuable in the future, both on an individual level and from a management and organisational perspective, in order to improve the safety of patient care.

### 7. Conclusion

This Swedish version of the APuP- OR is the first step in the development of an instrument to measure OR nurses’ attitudes towards PU prevention in a Swedish OR context. The reliability of the instrument was low and the validity moderate. A larger sample and the revision or addition of items related to the context of the operating room should be considered in order to confirm the psychometric properties of the instrument.

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### Declarations of competing interest

The authors have no conflicts of interest.
Acknowledgements

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