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Validity and reliability of the Turkish version of the PEER-U scale

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ABSTRACT

Background: Antenatal care is necessary for mother and infant by reducing or eliminating the risks which may occur in the antenatal and postnatal period. Ultrasound is one of the most commonly used examination methods in antenatal monitoring. Evaluating the expectations, experiences and reactions of both parents during routine ultrasound examinations is essential to provide the best antenatal care.

Objective: This study aims to test the validity and reliability of the PEER-U scale developed for Sweden by Ekelin et al.

Method: The PEER-U scale consists of before and after ultrasound scales. Four hundred and thirty-six parents participated in the study. Interviews were conducted with all participating parents in a private room 15 minutes before and five minutes after the ultrasound. Researchers analysed the PEER-U scale for language, content, construct, criterion-referenced validity and internal consistency reliability.

Results: The Turkish version of PEER-U has 21 items in the before ultrasound scale and 21 items in the after ultrasound scale. Cronbach's alpha was 0.65 for the before ultrasound scale and 0.89 for the after ultrasound scale.

Conclusion: The study determined that the Turkish version of the PEER-U scale is a valid and reliable scale for Turkish society.

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KEYWORDS

PEER-U; pregnancy; ultrasound; validity-reliability; Turkey

Introduction

Prenatal care is the first space where safe motherhood services are provided to pregnant women by healthcare professionals in order to reduce the number and intensity of problems that may arise during pregnancy, labour and the postpartum period (Sönmez, 2007; Taşkın, 2016). Certain diagnostic tests are run to evaluate pregnant women and fetuses in prenatal monitoring. Currently, the most commonly used test is the obstetric ultrasound. Turkish Population and Health Research (TNSA) data for 2008 indicated that 73.7% of pregnant women in Turkey receive prenatal care at least four times and that 96.0% of them use ultrasound (US) technology in at least one of these visits. TNSA data for 2013 indicated an increase in the percentages: while 88.9% of pregnant women receive prenatal care at least four times, 98.0% of them use US in at least one of these visits (Turkish Population and Health Research, 2008, 2013).

A US examination in prenatal visits is an important milestone for parents because it confirms the presence of a new life (Ekelin, Crang Svalenius, & Dykes, 2004). US examinations conducted during the prenatal period may be perceived as a health check that is only relevant for pregnant women and fathers may be excluded from this process. However, this is an important process for both parties. The inclusion of fathers in obstetric US examinations increases their sense of responsibility for the baby, aiding the transition to fatherhood and the development of fatherly emotions (Dheensa, Metcalfe, & Williams, 2013; Walsh, Tolman, & Davis et al., 2014). Including fathers in obstetric US examinations is important to prepare couples to become families.

Studies indicate that US examinations in prenatal visits affect parents' anxiety levels as well as their bonding with the baby (Alhusen, 2008; Bricker, Garcia, & Henderson et al., 2000; Ekelin, Crang Svalenius, & Larsson et al., 2009; Larsson, Svalenius, & Maršál et al., 2009; Molander, Alehagen, & Bertero, 2010). Usually, the anxiety level of parents with a healthy fetus significantly decreases following the obstetric US examination (Ekelin et al., 2009). However, it is worth noting that some parents worry US examinations can harm the fetus (Bricker et al., 2000). In addition, obstetric US examinations positively affect feelings of parental bonding with the baby which start in the prenatal period (Molander et al., 2010). Evaluating parents' expectations, experiences and reactions in routine US examinations during pregnancy is important to providing the best possible prenatal care.

No scale exists to evaluate parents' expectations, experiences and reactions to routine US examinations during pregnancy in Turkey. This study aims to test the validity and reliability of the Parents' Expectations, Experiences and Reactions to Routine Ultrasound Examination (PEER-U) scale. This paper describes the development and psychometric testing of a Turkish translation of the original Swedish PEER-U scale.

Methods

Research design

This is a methodological study which aims to adapt the PEER-U scale to the Turkish context, as well as to test its validity and reliability.

Target population and sample

The research population consists of pregnant women and their husbands who consulted the pregnancy polyclinics of a private hospital in Adana, Turkey between 1 January and 30 April 2016. Because husbands are not admitted to the polyclinic during pregnancy examinations in Adana's state hospitals, many prefer a special hospital in gynaecology. The sample was calculated based on the recommendation that the sample size in methodological studies be 5–10 times more than the number of items on the scale (Büyüköztürk, 2002). The PEER-U scale has 30 items for the 'Before Ultrasound' section and 23 items for the 'After Ultrasound' section; therefore, 436 people were included in the validity-reliability test of the scale.

Interviews were conducted with all participating parents in a private room 15 minutes before and five minutes after the ultrasound.

Recruitment criteria were as follows.

- Participants voluntarily joined the study.
- First pregnancy/fatherhood experience.
- Being in second trimester (13–24 weeks) of the pregnancy.
- Receiving normal ultrasound data following the ultrasound examination.
- Not having any communication difficulty and/or mental insufficiency.

Data collection tools

The researchers developed a 'Personal Information Form (Male – Female)' to collect data along with the 'PEER-U scale', 'State–Trait Anxiety Inventory (STAI-I)', and 'Sense of Coherence (SOC) Scale.' Because STAI-I and SOC were used to test the validity of the original PEER-U scale, we preferred these scales in this study.

Personal information form – female

Developed by researchers, this form consists of 33 questions and aims to identify pregnant women's sociodemographic characteristics, current health histories, obstetric histories and feelings and thoughts regarding the ultrasound.

Personal information form – male

Also developed by the researchers, this form consists of 24 questions and aims to identify male participants' sociodemographic characteristics, current health histories and feelings and thoughts regarding the ultrasound.

Parents' expectations, experiences and reactions to routine ultrasound examination scale

Ekelin et al. developed the original PEER-U scale for Sweden to evaluate parents' expectations, experiences and reactions to routine ultrasound examinations (Ekelin, Svalenius, & Dykes, 2008). The PEER-U scale consists of two separate scales; one before ultrasound and one after ultrasound. The Likert-type scale consists of four points: '1 = I do not agree at all, 2 = I somewhat agree, 3 = I quite agree, and 4 = I completely agree'. The before ultrasound section has 30 items and seven subdimensions while the after ultrasound section has 23 items and five subdimensions.

State–trait anxiety inventory

Spielberger et al. developed STAI-I in 1970; Öner and Le Comte translated it into Turkish in 1983. STAI-I consists of 20 questions in total. In this scale, if more than three questions are unanswered, the form is considered invalid and excluded from analysis. In STAI-I, individuals are asked to describe how they feel at a given moment. Scoring is based on '1 = None, 2 = A little, 3 = Very much and 4 = Completely'. The scale has direct and reverse type questions. Question numbers 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20 are scored

as reverse questions. The possible score ranges between 20 and 80 theoretically. Higher scores on the scale refer to higher levels of anxiety, while lower scores indicate lower anxiety levels (Öner & Le Compte, 1983; Spielberger, Gorsuch, & Lushane, 1970).

Sense of coherence scale

The first version of the SOC consisted of 29 questions. Our study used the short version, which was developed by Antonovsky in 1987. Scherler and Lajunen translated it to Turkish in 1997. It is a self-evaluation scale consisting of 13 questions. In the short version of the scale, five questions evaluate 'understandability', four questions 'meaningfulness' and four questions 'manageability'. It is a seven-point Likert-type scale. Each of the questions is scored between one and seven. The possible total score ranges between 13 and 91. As the total score from the scale increases, the individual sense of coherence also increases (Antonovsky, 1983, 1993; Antonovsky & Sagy, 1986; Scherler & Lajunen, 1997).

Data analysis

The data were analysed with the Statistical Package for Social Sciences (SPSS) for Windows 20.0 program and Analysis of Moment Structures (AMOS) 22.0 SPSS package program using proper analysis methods (Table 1).

To test the validity of the PEER-U scale, researchers conducted language, content, construct and criterion-referred validity analyses. Group and back-translation methods were used to determine the PEER-U scale's language validity. The researchers first carried out the original PEER-U scale's translation from English into Turkish, and this was then

Table 1. Techniques and statistical methods used in the study.

| Characteristics | Methods |
|---|--|
| The analysis of the participants' sociodemographic, obstetric and obstetric ultrasound related characteristics and their answers for PEER-U scale questions | Number and percentile distribution |
| Validity analysis of the scale | |
| <ul style="list-style-type: none"> • Language validity | <ul style="list-style-type: none"> • Group translation from English to Turkish • Back-translation from Turkish to English |
| <ul style="list-style-type: none"> • Content validity | Expert view <ul style="list-style-type: none"> • Arithmetic average, • Davis Technique; Content Validity Index (CVI) |
| <ul style="list-style-type: none"> • Construct validity | Convenience of sample size and data set for factor analysis; <ul style="list-style-type: none"> • Kaiser–Mayer–Olkin (KMO) Index • Barlett Tests |
| <ul style="list-style-type: none"> • Criterion-referenced validity/concurrent validity | Confirmatory Factor Analysis (CFA) Explanatory Factor Analysis (EFA) Pearson product–moment correlation coefficient technique |
| Reliability analysis of the scale | |
| <ul style="list-style-type: none"> • Internal consistency reliability | Total item correlation Cronbach's alpha reliability coefficient |

continued by specialists in the field, three bilingual (English–Turkish) lecturers working in the Midwifery Department in Turkey. After the researchers organised all the translations, the most appropriate expressions were selected and the Turkish version of the scale was created. A Turkish language expert evaluated this version and necessary modifications were made in line with the suggestions. Three separate bilingual (English–Turkish) specialists in the field who had never previously heard of the survey carried out the back-translation of the scale from Turkish to English. After that, the back-translation of the scale was compiled and submitted to the author of the scale. Expert opinions were then consulted to assess the content validity of the PEER-U scale. For this purpose, the final version of the scale was presented to expert opinions. Experts were reached via e-mail. Ten experts, including six midwife/nurse academicians, three obstetricians and one lecturer, evaluated the representativeness and appropriateness of the scale items using a four-point Likert scale.

Expert opinions were analysed using the Davis technique (Davis, 1992), which is a technique used in the content validity test. This technique evaluates the opinions of experts according to their suitability. Thus, the Content Validity Index (CVI) is obtained. After the translation and expert opinions process, a pilot practice was conducted. Before factor analysis, the Kaiser–Mayer–Olkin (KMO) and Barlett criteria were used to test the variables' suitability in the factor analysis as well as to test the sample size (Barlett, 1950; Kaiser, 1974).

Finally, the scale's construct validity was tested with Confirmatory Factor Analysis (CFA) and Explanatory Factor Analysis (EFA) methods (Alpar, 2016; Tavşancıl, 2014). Criterion-referred validity analysis of the PEER-U scale analysed correlations between STAI-I and SOC (Table 1).

Internal consistency analysis was conducted to test the reliability of the PEER-U scales before and after ultrasound. Total item score correlations and the Cronbach's alpha coefficient were calculated for internal consistency reliability (Table 1).

Ethical considerations

Permission was obtained from Maria Ekelin, the corresponding author who developed the PEER-U scale. The Cukurova University Medical Faculty Noninvasive Clinical Research Ethics Committee's confirmation was received. The relevant hospital's permission and participating parents' informed consent were also obtained.

Results

Participants' characteristics

The ages of 38.5% of the participants range from 26 to 29 and the average age is 28.08 ± 4.705 (min. = 17, max. = 47). Of the participants, 50.5% are female, 99.1% are in a civil marriage and 95.0% have a nuclear family; 50.5% have a bachelor's degree or above; 69.0% are employed; 97.5% of the participants have social security, 95.0% consider their income level medium, 65.2% have equal income and expenses and 75.0% live in cities; 8.3% of the participants stated that they have a chronic illness. Thirteen mothers and six fathers refused to participate in the study.

Findings on validity analysis of PEER-U scale

Translation and language validity

After the translation process, the scale was applied to 20 parents not included in the study who fit the sample's characteristics, as a pilot practice. After the practice, the necessary modifications were made in line with the participants' opinions, finalising the scale.

Content validity

The content validity index of all items belonging to the scale was above 0.80. For this reason, no item has been removed from the scale due to content validity. Before ultrasound the CVI score was 0.97 and after ultrasound it was 1.00. After this application, appropriate changes have been made in accordance with the recommendations. The Turkish form of the PEER-U scale has been obtained.

Construct validity

In construct validity analysis of the scale, KMO and Barlett tests were run before factor analysis. Before ultrasound the KMO value of the PEER-U scale was 0.800 and after ultrasound the KMO value was 0.930. The Barlett test indicated $X^2 = 2273.285$, $p < 0.001$ for the before ultrasound scale and $X^2 = 3707.049$, $p < 0.001$ for the after ultrasound scale.

Explanatory and confirmatory factor analyses were conducted in construct validity analysis of the scale. In the original PEER-U scale, the before ultrasound scale consisted of seven subdimensions and 30 items and the after ultrasound scale consisted of five subdimensions and 23 items. Following the EFA, 58.41% of variation in the before ultrasound scale could be explained, while explained variation in the after ultrasound scale was 61.03%.

Following the confirmatory factor analysis, item 27 in the 'anxiety about baby's health' subdimension, item 2 in the 'expectation about interaction with staff' subdimension, items 7 and 29 in the 'attachment' subdimension, items 22 and 25 in the 'reservation' subdimension, item 19 in the 'deciding' subdimension and items 9 and 24 in the 'interpretation' subdimension of the before ultrasound scale were omitted due to their insufficient item factor loads. Table 2 lists the results of the CFA. After omission of the items with insufficient factor loads, fit indices of the before ultrasound scale were calculated as Comparative Fit Index (CFI) 0.901 and Root Mean Square Error of Approximation (RMSEA) 0.052 (Table 2). The factor structure of the PEER-U scale's before ultrasound items because of CFA are presented in the PATH diagram (Figure 1). In the after ultrasound scale, item 12 in the 'attachment' subdimension and item 7 in the 'family affinity' subdimension were omitted due to their insufficient item factor loads. After omission of the items with insufficient factor loads, fit indices of the after ultrasound scale were calculated as CFI 0.940, and RMSEA 0.053 (Table 2). The factor structure

Table 2. Fit indices for confirmatory factor models in the Turkish PEER-U scale.

| Fit index of before ultrasound scale | Results | Fit index of after ultrasound scale | Results |
|--------------------------------------|---------|-------------------------------------|---------|
| X^2/SD | 2.194 | X^2/SD | 2.214 |
| CFI | 0.901 | CFI | 0.940 |
| GFI | 0.923 | GFI | 0.915 |
| AGFI | 0.898 | AGFI | 0.888 |
| RMSEA | 0.052 | RMSEA | 0.053 |
| SRMR | 0.0458 | SRMR | 0.0461 |

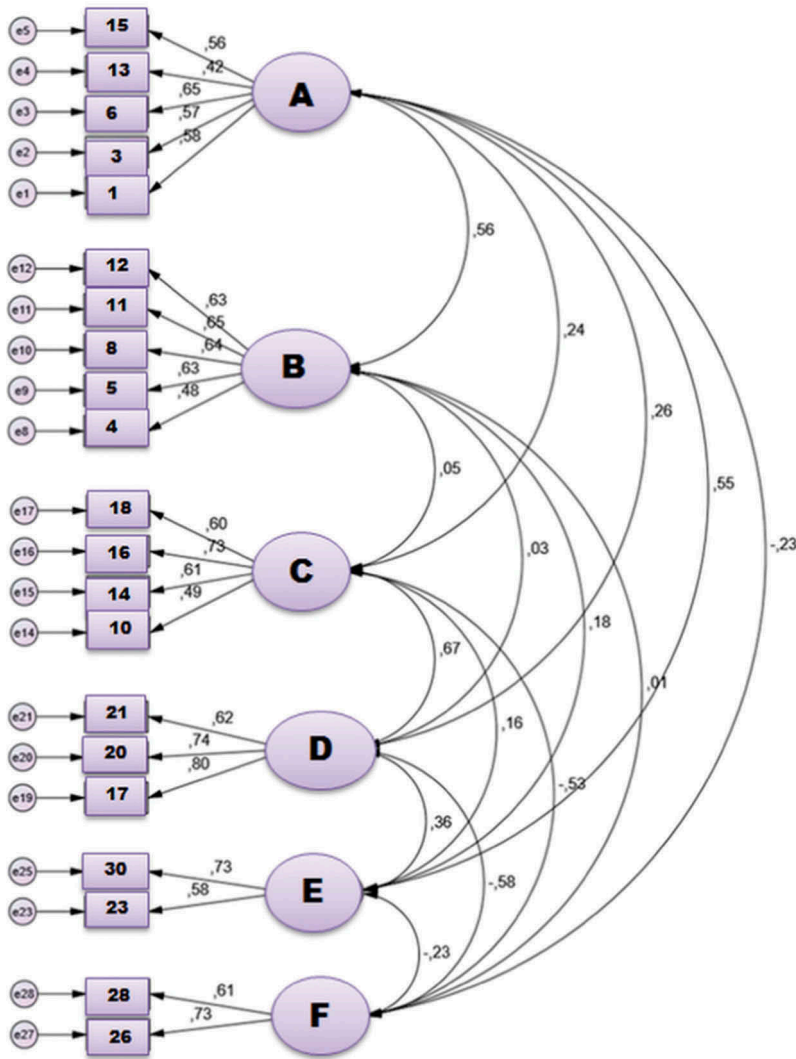


Figure 1. As a result of Confirmatory Factor Analysis, obtained factor structure of before ultrasound scale. A, Anxiety about baby's health; B, expectation about interaction with staff; C, attachment; D, verification; E, reservation; F, deciding.

of the after ultrasound items of the PEER-U scale because of CFA is presented in the PATH diagram (Figure 2).

Because of validity and reliability tests, the factor loads of question numbers 2, 7, 9, 19, 22, 24, 25, 27 and 29 for before ultrasound and 7 and 12 for after ultrasound sections of the original PEER-U scale were found insufficient in the Turkish version and omitted. The final version of the form was composed accordingly.

The Turkish version of the PEER-U before ultrasound scale has six subdimensions: anxiety about the baby's health (1, 3, 6, 13, 15), expectation about interaction with staff (4, 5, 8, 11, 12), attachment (10, 14, 16, 18), verification (17, 20, 21), reservation (23, 30) and deciding (26, 28), adding up to 21 questions in total. The after

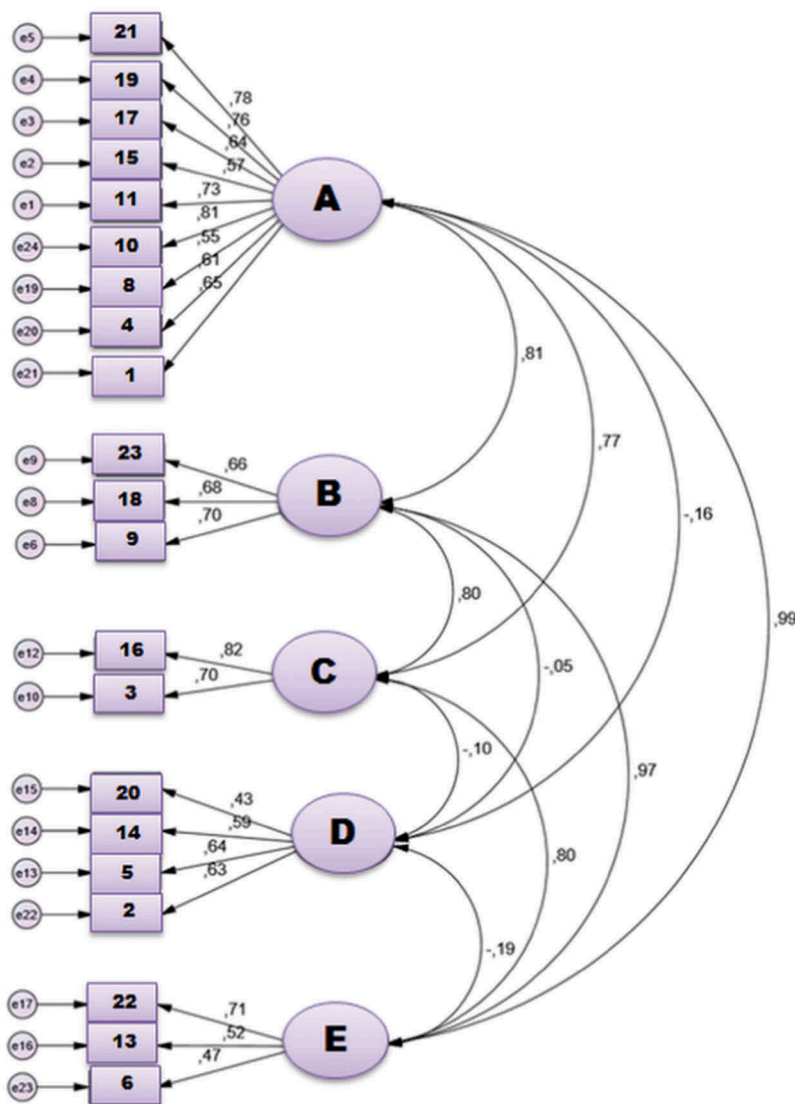


Figure 2. As a result of Confirmatory Factor Analysis, obtained factor structure of after ultrasound scale.

A, Information during examination; B, attachment; C, family affinity; D, anxiety about the results; E, sense of security.

ultrasound part of the scale consists of five subdimensions: information during examination (1, 4, 8, 10, 11, 15, 17, 19, 21), attachment (9, 18, 23), family affinity (3, 16), anxiety about the results (2, 5, 14, 20) and sense of security (6, 13, 22), also adding up to 21 questions in total.

Criterion/concurrent validity

Criterion-referred validity analysis of the PEER-U scale analysed correlations between STAI-I and SOC analysed. A linear relation was found between the subdimensions of the PEER-U scale and STAI-I and a reverse relation was found between SOC and

Table 3. Correlations Between the Turkish PEER-U scale and the other scales (STAI-I and SOC).

| Scales | STAI-I | | SOC | |
|--|--------------|------------------|---------------|------------------|
| | <i>r</i> | <i>p</i> | <i>r</i> | <i>p</i> |
| Before ultrasound | 0.323 | <0.001 | -0.411 | <0.001 |
| Anxiety about baby's health | 0.167 | <0.001 | -0.196 | 0.074 |
| Expectation about interaction with staff | 0.155 | 0.001 | -0.198 | 0.072 |
| Attachment | 0.221 | <0.001 | -0.262 | 0.016 |
| Verification | 0.127 | 0.008 | -0.239 | 0.028 |
| Reservation | 0.136 | 0.004 | -0.204 | 0.063 |
| Deciding | 0.114 | 0.017 | -0.137 | 0.212 |
| After ultrasound | 0.216 | <0.001 | -0.233 | 0.033 |
| Information during examination | 0.193 | <0.001 | -0.162 | 0.140 |
| Attachment | 0.106 | 0.027 | -0.134 | 0.223 |
| Family affinity | 0.258 | <0.001 | -0.306 | 0.005 |
| Anxiety about the results | 0.122 | 0.011 | -0.159 | 0.150 |
| Sense of security | 0.149 | 0.002 | -0.192 | 0.081 |

subdimensions. A statistically significant, positive and linear relationship was found between STAI-I and subdimensions of the PEER-U scale ($p < 0.05$). A statistically significant, negative and reverse relation was found between SOC and the before ultrasound scale's attachment and verification subdimensions, as well as the after ultrasound scale and its family affinity subdimension ($p < 0.05$) (Table 3).

Internal reliability

For internal reliability analysis of the PEER-U scale, total item score correlations and Cronbach's alpha values were calculated. Total item score correlations range between 0.308 and 0.645 for subdimensions of the before ultrasound scale (Table 4). Total item score correlations range between 0.334 and 0.764 for subdimensions of the after ultrasound scale (Table 5). Total item score correlations of Turkish PEER-U scale items were found higher than 0.20. The Cronbach's alpha value was calculated as 0.65 for the before ultrasound scale and as 0.89 for the after ultrasound scale. The Cronbach's alpha values ranged between 0.59 and 0.76 for subdimensions in the before ultrasound scale and between 0.56 and 0.88 for subdimensions in the after ultrasound scale (Tables 4 and 5).

The Turkish PEER-U scale

The Turkish PEER-U scale also consists of separate before ultrasound and after ultrasound scales. The before ultrasound scale has 21 items and six subdimensions and the after ultrasound has 21 items and five subdimensions. The four-point Likert-type scale consists of '1 = I do not agree at all, 2 = I somewhat agree, 3 = I quite agree, and 4 = I completely agree'. Before ultrasound questions 10, 14, 16, 17, 18, 20, 21, 26 and 28, as well as 1, 3, 4, 6, 8, 9, 10, 11, 13, 15, 16, 17, 18, 19, 21, 22 and 23 for the after ultrasound section of the Turkish PEER-U scale are calculated as reverse questions. The evaluation of scale scores is based on factors and the total scale scores are not used. For each scale and its subdimensions, higher scores are considered 'negative' while lower scores are considered 'positive'.

Table 4. Item statistics, reliability analysis based on the corrected item total correlation and Cronbach's alpha coefficient if one item deleted of before ultrasound scale.

| | Item number | Mean \pm SD | Item total correlation | If the item is deleted, Cronbach's alpha |
|--|-------------------------|------------------|------------------------|--|
| Anxiety about baby's health | 1 | 2.00 \pm 1.032 | 0.502 | 0.596 |
| | 3 | 1.63 \pm 0.891 | 0.472 | 0.614 |
| | 6 | 1.73 \pm 0.971 | 0.476 | 0.609 |
| | 13 | 2.89 \pm 1.089 | 0.308 | 0.690 |
| | 15 | 1.65 \pm 0.883 | 0.433 | 0.630 |
| | Cronbach's alpha | | | |
| Expectation about interaction with staff | 4 | 1.79 \pm 1.030 | 0.419 | 0.725 |
| | 5 | 1.72 \pm 0.951 | 0.521 | 0.674 |
| | 8 | 1.44 \pm 0.760 | 0.532 | 0.673 |
| | 11 | 1.42 \pm 0.725 | 0.514 | 0.681 |
| | 12 | 1.48 \pm 0.777 | 0.525 | 0.675 |
| | Cronbach's alpha | | | |
| Attachment | 10 | 1.39 \pm 0.815 | 0.421 | 0.660 |
| | 14 | 1.23 \pm 0.644 | 0.510 | 0.610 |
| | 16 | 1.34 \pm 0.736 | 0.577 | 0.558 |
| | 18 | 1.47 \pm 0.848 | 0.413 | 0.669 |
| | Cronbach's alpha | | | |
| Verification | 17 | 1.52 \pm 0.918 | 0.596 | 0.678 |
| | 20 | 1.70 \pm 0.963 | 0.645 | 0.620 |
| | 21 | 1.70 \pm 1.036 | 0.543 | 0.742 |
| | Cronbach's alpha | | | |
| Reservation | 23 | 2.17 \pm 1.064 | 0.425 | * |
| | 30 | 2.14 \pm 1.164 | 0.425 | * |
| | Cronbach's alpha | | | |
| Deciding | 26 | 1.76 \pm 1.076 | 0.445 | * |
| | 28 | 1.61 \pm 1.026 | 0.445 | * |
| | Cronbach's alpha | | | |
| Total Cronbach's alpha | | | | 0.654 |

Discussion

Discussion on characteristics of demographic of participants

This study's sample consisted of 436 parents and the mean age of participants was 28.08 ± 4.705 years (min. = 17, max. = 47). The sample of Ekelin et al.'s study was composed of 44 parents and the mean age ranged from 22 to 41 years (Ekelin et al., 2004). Ekelin et al.'s review of developing PEER-U scale studies consisted of 156 parents, with the age of participants ranging from 21 to 48 years (Ekelin et al., 2008). Of the participants, 50.5% had a bachelor's degree or above in this study. Ekelin et al. reported that 52.3% of the participants were university graduates (Ekelin et al., 2008). The age distributions and education levels of the participants in our study were in line with the age distributions and education levels of the participants in the original study.

Discussion on validity of the PEER-U scale

The Turkish version of the PEER-U scale is a proper scaling tool in terms of its language and content (Alpar, 2016; Yurdagül, 2005). In the original scale, the KMO value was 0.75

Table 5. Item statistics, reliability analysis based on the corrected item total correlation and Cronbach's alpha coefficient if one item deleted of after ultrasound scale.

| | Item number | Mean ± SD | Item total correlation | If the item is deleted, Cronbach's alpha |
|--------------------------------|-------------------------------|-------------------------|------------------------|--|
| Information during examination | 1 | 1.53 ±0.890 | 0.655 | 0.864 |
| | 4 | 1.70 ±0.998 | 0.571 | 0.872 |
| | 8 | 1.81 ±1.045 | 0.532 | 0.877 |
| | 10 | 1.50 ±0.824 | 0.764 | 0.856 |
| | 11 | 1.55 ±0.844 | 0.713 | 0.860 |
| | 15 | 1.72 ±0.954 | 0.542 | 0.874 |
| | 17 | 1.65 ±0.949 | 0.599 | 0.869 |
| | 19 | 1.49 ±0.795 | 0.648 | 0.865 |
| | 21 | 1.41 ±0.723 | 0.686 | 0.864 |
| | | Cronbach's alpha | | |
| Attachment | 9 | 1.61 ±0.883 | 0.570 | 0.590 |
| | 18 | 1.63 ±0.910 | 0.578 | 0.581 |
| | 23 | 1.36 ±0.746 | 0.480 | 0.699 |
| | | Cronbach's alpha | | |
| Family affinity | 3 | 1.22 ±0.585 | 0.573 | * |
| | 16 | 1.25 ±0.593 | 0.573 | * |
| | | Cronbach's alpha | | |
| Anxiety about the results | 2 | 1.50 ±0.851 | 0.463 | 0.569 |
| | 5 | 1.36 ±0.775 | 0.489 | 0.555 |
| | 14 | 1.55 ±0.889 | 0.450 | 0.579 |
| | 20 | 1.37 ±0.825 | 0.350 | 0.645 |
| | | Cronbach's alpha | | |
| Sense of security | 6 | 1.65 ±1.000 | 0.334 | 0.521 |
| | 13 | 1.83 ±1.045 | 0.337 | 0.523 |
| | 22 | 1.53 ±0.829 | 0.465 | 0.346 |
| | | Cronbach's alpha | | |
| | Total Cronbach's alpha | | | 0.891 |

for the before ultrasound scale and 0.69 after ultrasound (Ekelin et al., 2008). In our study, the KMO value was 0.80 for the before ultrasound scale and 0.93 after ultrasound. These values indicate that the sampling number is sufficient for factor analysis (Alpar, 2016; Field, 2000; Tavşancıl, 2014). The Barlett test result indicated $p < 0.001$ for the before and after ultrasound scales of the original PEER-U (Ekelin et al., 2008). In our study, the Barlett test results indicated $p < 0.001$ for before and after ultrasound scales. These findings indicate that the data distribution is suitable for factor analysis (Alpar, 2016; Tavşancıl, 2014).

In the original scale, the EFA indicated that the explained variation of the before ultrasound scale is 59.20% and the explained variation of the after ultrasound scale is 48.09% (Ekelin et al., 2008). In our study, the explained variation of the before ultrasound scale was 58.41% and the explained variation of the after ultrasound scale was 61.03%. In line with the literature, it can be claimed that the explained variation is sufficient based on the EFA findings in our study (Alpar, 2016; Tavşancıl, 2014).

The original PEER-U scale consists of two separate scales, one before and one after ultrasound. The before ultrasound section has 30 items and seven subdimensions while the after ultrasound section has 23 items and five subdimensions.

In the literature, the lower value for the factor load of the items included in the scale is specified as 0.30–0.40 (Tavşancıl, 2014). In this study, according to the results of CFA,

items 2, 7, 9, 19, 22, 24, 25, 27 and 29 of the before ultrasound and items 7 and 12 after ultrasound were found to be lower than 0.40 (Figure 1 and Figure 2). CFA results indicated that the factor loads of the before ultrasound scale ranged between 0.42 and 0.80 and the factor loads of the after ultrasound scale ranged between 0.43 and 0.82 (Figures 1 and 2). The findings in our study indicate that the scale's fit indices are within acceptable values and that the scale has adequate construct validity (Table 2) (Çapık, 2014; Çelik & Yılmaz, 2016; Waltz, Strickland, & Lenz, 2010; Wang & Wang, 2012).

The forms used for the original PEER-U scale were preferred for concurrent validity analysis of the scale's Turkish version. The correlation between the original PEER-U before ultrasound scale and STAI-I was $r = 0.530$; the correlation between the after ultrasound scale and STAI-I was $r = 0.374$ ($p < 0.001$) (Ekelin et al., 2008). In addition, the correlation between the original PEER-U before ultrasound scale and SOC was $r = -0.293$, while the correlation between the after ultrasound scale and SOC was $r = -0.269$ ($p < 0.05$) (Ekelin et al., 2008). The correlation between the Turkish PEER-U before ultrasound scale and STAI-I was $r = 0.323$; the correlation between the after ultrasound scale and STAI-I was $r = 0.216$. A statistically significant, positive (linear) and weak correlation was found between the before and after ultrasound scales of PEER-U and STAI-I ($p < 0.05$) (Table 3). The correlation between the Turkish PEER-U before ultrasound scale and SOC was $r = -0.411$ and the correlation between the after ultrasound scale and SOC was $r = -0.233$ ($p < 0.05$) (Table 3). A statistically significant, reverse (negative) and weak correlation was found between the before and after ultrasound scales of PEER-U and SOC (Table 3). These findings are similar to the results of concurrent validity analysis of the original scale.

Discussion on reliability of the PEER-U scale

None of the items were omitted from the scale as all the items were positive, their total item score correlations were higher than 0.20 and thus the correlations of all the items were considered sufficient (Tavşancıl, 2014) (Tables 4 and 5). The Cronbach's alpha value was 0.77 for the before ultrasound scale and 0.75 for the after ultrasound scale of the original PEER-U (Ekelin et al., 2008). In our study, the Cronbach's alpha value was 0.65 for the Turkish version of the before ultrasound scale and 0.89 for the after ultrasound scale (Tables 4 and 5). These findings indicate that the before ultrasound scale of PEER-U is reliable and the after ultrasound scale highly reliable (Tavşancıl, 2014).

Although this study was conducted in a private hospital, homogeneous distribution of educational levels of the participants was an important advantage. In Adana, the research was carried out in a private hospital because no partners were admitted to pregnancy examination in the public hospitals, so this situation can be considered a limitation. If institutional arrangements allow partners to be admitted to pregnancy examination in state hospitals, this limitation can be overcome.

This study determined that the Turkish version of the PEER-U scale is a valid and reliable scale for Turkish society. Because the Turkish PEER-U scale is a valid and reliable measurement tool, it is advisable to use it to determine the expectations, experiences and reactions of parents during routine pregnancy ultrasound examinations.

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