The reliability and validity of the Turkish version of the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) with pregnant women

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Accessible summary

- The reliability and validity of the Turkish version of the Wijma Delivery Expectancy/Experience Questionnaire suggests that the Turkish version of the Wijma Delivery Expectancy/Experience Questionnaire has good comprehensibility, internal consistency and validity and is an adequate and useful instrument for the evaluation of fear of childbirth in Turkish pregnant women.

Abstract

This methodological study was planned to translate the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) into Turkish and to investigate its reliability for both nulliparous and parous women in Turkish population. A total of 660 healthy women with normal pregnancies at gestational ages of between 28 and 40 weeks were recruited. The internal consistency reliability (Cronbach's α) was used for determining the reliability of the W-DEQ. Construct validity was also determined utilizing the known-groups method. In this study, independent sample *t*-tests were used to compare the nulliparous and parous groups differing in known fear status. In order to test the construct of the W-DEQ, Beck Anxiety Inventory, Depression Anxiety and Stress Scale and Brief Measure of Worry Severity scales were chosen as these scales are expected to correlate with the W-DEQ. Analysis of the construct validity of the W-DEQ version A using Pearson's correlation coefficients was performed for both nulliparous and parous women separately. All the scales in both groups showed a statistically significant correlation with the W-DEQ. The alpha coefficient (0.89) is well above the 0.70 criterion for internal consistency reliability. Turkish form of Wijma Delivery Expectancy/Experience Questionnaire Version A was fixed as reliable and valid means to measure the level of fear of childbirth among Turkish pregnants.

Introduction

Pregnancy and childbirth are major life processes for women (Hofberg & Ward 2004); they are transition periods in a women's life associated with heightened levels of emotion and anxiety (Green *et al.* 2003). They are normal physiological processes and significant and emotional events in the life of a woman and her family (Fisher *et al.* 2006). However, the conception, pregnancy and postnatal periods are influenced by the women's personality, experience and sexuality (Hofberg & Ward 2004, Fisher *et al.* 2006).

The Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ version A and B) has been developed to measure women's feelings and fear about childbirth by means of the woman's cognitive appraisal regarding the

delivery process and its first psychometric properties was evaluated by Wijma *et al.* (Wijma *et al.* 1998). It is a self-scale assessment instrument and has been used both in scientific and clinical studies by many researchers (e.g. Johnson & Slade 2002, Heimstad *et al.* 2006, Ryding *et al.* 2007, Wiklund *et al.* 2008). The W-DEQ has previously been factor analysed twice by Johnson & Slade (2002) and Wiklund *et al.* (2008) and was found to measure four clear dimensions that are conceptually distinct: fear, lack of positive anticipation, isolation and riskiness. Several other scales have been developed for the evaluation of anxiety, depression and worry. Three commonly used such scales are the Beck Anxiety Inventory (BAI), Depression Anxiety and Stress Scale (DASS) and Brief Measure of Worry Severity (BMWS) scales. Although the BAI, DASS and BMWS scales have been translated into Turkish, up to date no Turkish version of the W-DEQ has been psychometrically validated. As a widely used scale in the evaluation of fear of childbirth, the W-DEQ awaits formal translation and validation into Turkish to achieve an equivalent questionnaire and to allow comparability of the results with other studies such as Wijma *et al.* (1998), Johnson & Slade (2002) and Wiklund *et al.* (2008).

Background

Although up to 80% of women identify common concerns, just over 20% report more specific or intense worries with between 6–10% of women experiencing severe fear of labour and birth that is dysfunctional or disabling (Zar *et al.* 2001, Saisto & Halmesmaki 2003, Fisher *et al.* 2006). Some women may abstain from pregnancy or request an elective cesarean section, as a result of phobic fear of vaginal birth, or tocophobia (Ryding *et al.* 2007). Type of fear, primary fear of delivery, might manifest during first pregnancies and childbirth (Saisto *et al.* 2001). In a study by Areskog *et al.* fear of childbirth was expressed more frequently by primiparas than by multiparas (Areskog *et al.* 1981). Fear of childbirth is more intensive in nulliparous women than in parous women (Alehagen *et al.* 2000).

Although women's fear of vaginal childbirth seems to have important consequences, little is known about the factors associated with this fear (Melender 2002, Saisto & Halmesmaki 2003). Pregnant women with low income and low education more often fear the childbirth (Hildingsson *et al.* 2002). Saistro *et al.* showed that the occurence of fear of childbirth was associated with unemployment, lack of social support and low satisfaction with partner (Saisto *et al.* 2001). It has been hypothesized that women's fear of childbirth during the third trimester of pregnancy, if significantly high, may result in obstetric complications, negative delivery experience and/or an increased risk of

emergency caesarean section (Johnson & Slade 2002). Also the fear of childbirth was more common in anxious, vulnerable women with low self-esteem (Saisto *et al.* 2001). Personal conditions are a reflection of women's anxieties about maintaining a sense of personal control (Wijma *et al.* 2002, Fisher *et al.* 2006).

Studies report that women's fear related to childbirth is multidimensional and detailed, concerned with pain, obstetric injuries, their own incapability, loss control, insufficient support and loss of the baby's or their own life and being left without assistance during labour (Sjögren 1998, Eriksson *et al.* 2006). In a study of 100 Scandinavian women identified as suffering intense childbirth fear, over 65% were worried about their performance in labour and their own body's ability to birth (Saisto & Halmesmaki 2003). Antenatal fears may predict pain and distress during labour and increase the risk of severe emotional instability post-natally (Melender 2002). In a Turkish sample, the scores of 19 nulliparous women were grouped into five main categories: labour pain, problems that can develop during labour, procedures carried out during labour, attitudes of health care personnel and sexuality (Serçekuş & Okumuş 2009).

Maternal anxiety has been associated with both premature and post-term delivery, and birth asphyxia have been shown to be particularly common fetal outcomes in anxious women, perhaps because of increased uterine artery resistance (Saisto *et al.* 2001). Also the fear of childbirth implies an increased risk of intrapartum complications, such as prolonged labour or fetal asphyxia (Johnson & Slade 2002).

The aims of the present study are to translate the W-DEQ into Turkish, to perform its cross-cultural adaptation for Turkish pregnant women and to investigate its reliability for both nulliparous and parous women in Turkish population. Cross-cultural validation of an existing scale, such as the W-DEQ, has the great advantage of avoiding the initial stages of development of a new questionnaire, which is a lengthy process. Furthermore, translation and adaptation of a scale into different languages makes it possible to use the questionnaires in comparative international multicenter studies. This is why we decided first to translate, retranslate and then proceed to check the validity, reliability and psychometric properties of the scale for a Turkish population.

Materials and methods

Objective

This research is a methodological study that is carried out in order to evaluate the validity and reliability of the W-DEQ scale to be used in determining the fear of childbirth.

Study population

A total of 660 healthy women with normal pregnancies were recruited in this study. A written invitation to participate in the study was sent to all pregnant women who were scheduled for a routine ultrasound scan at three maternity health clinics, Akdeniz University Hospital ($n = 220$), Atatürk State Hospital ($n = 220$), Antalya Research and Education Hospital ($n = 220$) between February 2007 and March 2008. They were asked to return the questionnaires at gestational ages of between 28 and 40 weeks when attending the routine scan, and we did not send a reminder to the non-respondents.

Inclusion criteria

- Visiting to Akdeniz University Hospital, Atatürk State Hospital, Antalya Research and Education Hospital for routine controls
- Gestational ages of between 28 and 40 weeks with a healthy baby
- Age superior to 15 and inferior to 45 years
- Being able to read Turkish and willing to participate in this study

Exclusion criteria

- Having a chronic illness
- Having a sexually transmitted disease
- Having complications during pregnancies
- Experienced cesarean section in previous pregnancy/pregnancies

Procedure

The necessary permissions were obtained from the management of the institutions to conduct this study. The adaptation and validation of an instrument involves several stages. Initially, the translation process provides an initial version of the questionnaire. An examination of reliability usually follows, and finally construct validity. The latter stage will also provide information about the scale performance (for example, item total correlations), which may be used to compare the original and newly adapted instruments.

A systematic literature review was undertaken by conducting multiple searches of the Cochrane Library, CINAHL, Nursing Research Center, MEDLİNE, Ebsco-HOST, Science Direct, ProQuest, Ovid, Blackwell Synergy up until 2008. The MeSH heading 'fear', and the free text words 'fear of childbirth', 'fear of labour', 'birth and psychology', 'birth and worry', 'fear and parturition', 'W-DEQ', 'pregnancy', 'anxiety', 'depression', 'stress', 'fear and pregnancy', 'tocophobia' in the title were used.

The research procedure consisted of two parts: (1) translation and adaptation of the W-DEQ from English into Turkish and adaptation of measures and (2) data collection. The translation of the measures was performed based on a back translation method in order to maintain the reliability and validity of translated measures. The questionnaire was first translated into Turkish and then the back translation was done by four translators who are fluent in both English and Turkish. The translation method consisted of reviewing, translating and adapting the measures from English to Turkish (and back to English again). The last back translation was then compared with the first translation done by the researcher and a high concordance between them was found.

The questionnaires took approximately 25 min to complete. The completed measures were checked by the researcher to ensure there were no obvious problems in their completion.

Measures

Several measures were used in this study. However, for the purpose of the present study, informations were obtained from the sociodemographic questionnaire, W-DEQ version A, BAI, DASS and BMWS and scales were reported here. The questionnaire therefore comprised five parts: sociodemographic questionnaire, estimation of fear of childbirth, estimation of beck anxiety, estimation of depression, anxiety and stress, and estimation of worry severity. In the first part, every woman answered a sociodemographic questionnaire assessing age in years, gestational age, level of education, partner's support, the situation of both spouses wanting the baby, prior deliveries, parity (primiparous, multiparous), number and experience of earlier childbirths and attendance in prenatal classes.

In the second part, fear of childbirth during pregnancy was measured based on the woman's cognitive appraisal of the delivery by the W-DEQ-inventory (version A, Wijma *et al*.), translated from English to Turkish by researchers fluent in both Turkish and English languages. The W-DEQ is a validated 33-item questionnaire, with scores ranging from 'not at all' (0) to 'extremely' (5), giving a minimum score of 0 and a maximum score of 165. A higher score indicates a more intense fear of childbirth. This means that the answers of those questions that are positively formulated (item numbers 2, 3, 6, 7, 8, 11, 12, 15, 19, 20, 24, 25, 27, 31) have to be reversed for the calculation of the women's individual sum score (Wijma *et al.* 1998). A W-DEQ score of greater than 100 is considered to indicate a clinical problem, i.e. a very frightening delivery experience (Ryding *et al.* 2003).

In the third part of the questionnaire, BAI (Beck & Steer 1991) was used to measure physical, emotional and cognitive aspects of anxiety and fear of losing control. The BAI is 21-item self-reported measure and responses on each item range from 0 (not at all bothered) to 3 (severely bothered), with a possible range of total scores from 0 to 63. The higher points of this scale reflect higher level of anxiety. As part of the development of the BAI, Beck *et al.* (Beck & Steer 1991) obtained the internal consistency and test–retest reliability estimates of 0.92 and of 0.75, respectively. The BAI was shown to be applicable for Turkish population by Ulusoy *et al.* (1998).

In the fourth part, the Depression Anxiety Stress Scale was used to measure current (within the past week) symptoms of depression, anxiety and stress. The DASS is a 42-item self-administered instrument developed by Lovibond and Lovibond (Lovibond & Lovibond 1995), which is increasingly used in different settings and has three scales (depression, anxiety and stress). The total scores of each scale consist of the sum of the items, and are scored separately. Respondents indicate how much the item statements have applied to them over the past week using a 4-point Likert scale, ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Turkish adaptation of DASS and the validity and reliability of the Turkish version of the scale were carried out by Akın & Çetin (2007). Language and concurrent validity coefficients were found to be high (0.96 and 0.87, respectively). Internal consistency of the entire scale was 0.89. Item-total correlations ranged from 0.51 to 0.75. Test–retest and split-half reliability coefficient scores were 0.99 and 0.96, respectively. These results demonstrate that the DASS is a valid and reliable instrument (Akın & Çetin 2007).

In the final part of the questionnaire, severity of worry was measured by the BMWS (Gladstone *et al.* 2005). The BMWS is an 8-item self-reported questionnaire, which is a widely used measure of worry. It has strong internal consistency (0.92) and has demonstrated good construct validity and discriminant clinical validity (Gladstone *et al.* 2005). The questions required subjects to judge the personal acceptability of their general worrying. Eight items are rated on a 4-point scale (scales 0–3) with options (scales 0–3) being: (1) completely acceptable, (2) somewhat unacceptable, (3) moderately unacceptable or (4) definitely unacceptable. Following a series of analyses, test–retest correlation ($r = 0.76$) and internal consistency (Cronbach's alpha 0.88) of The Turkish BMWS were found to be statistically high. Together with, the measure showed unifactorial construct, the scores of the measure differentiated between depression group and anxiety group. Furthermore, significance of the Turkish BMWS's correlations with Penn State Worry Questionnaire ($r = 0.75$) and Trait State Anxiety Inventory (for State Anxiety Inventory $r = 0.42$; for Trait Anxiety Inventory $r = 0.72$) statistically supported construct validity (Tunay & Soygüt 2007).

Item-total analysis

Item-total correlations, which are a measure of internal consistency, compare the scores for the individual items with the overall score of the scale. Items with item-total correlations less than 0.4 should be evaluated for rejection. Item-total correlations of the W-DEQ versions A were calculated using Pearson's product moment correlation coefficient.

Reliability

The internal structure and reliability of the W-DEQ scale were evaluated by means of item-internal consistency and internal consistency reliability (Cronbach's alpha coefficient). Internal consistency of the instrument that relates to its homogeneity measures the extent to which items within a scale are correlated with each other. Internal consistency estimating the average of the correlations between items within a dimension was calculated by Cronbach's alpha coefficient (Cronbach 1951), using the baseline scores of all questionnaire items. If the W-DEQ questionnaire is internally consistent in the pregnant women population, items within the individual scales (dimension) would be expected to be highly correlated with one another. The coefficients for Cronbach's alpha were calculated separately for the nulliparous group and parous group and for the combined group. The hypothesis that the standard psychometric recommendations for Cronbach's alpha was greater than or equal to 0.7 was taken as a starting point for both internal consistency. According to Streiner and Norman (Streiner & Norman 1995) a value of 0.8 is usually regarded as acceptable for high internal consistency (McHorney *et al.* 1994, Nunnally & Bernstein 1994). Measures with reliability of 0.50–0.70 or greater have been recommended for group comparison, while an alpha value >0.90 is required when analysing an individual woman's score (McHorney *et al.* 1994).

Validity

Validity refers to the ability of an instrument to measure what is intended to measure. The assessment of content validity of functional scales is rather difficult as there is no single 'gold standard' with which to compare the results. Our objective was therefore to present only construct validity of the scale. Construct validity was tested using both convergent and divergent validity. The instrument can be

compared with other measures in which there would be an expected level of agreement (convergent validity) or disagreement (divergent validity) (Streiner & Norman 1995). Convergent and discriminant validity are considered as two forms of construct validity. The scores on similar measures are expected to be correlated with each other in convergent (Bellamy 1993) and scales that measure dissimilar constructs are found to be unrelated in discriminant validity (Engelberg *et al*. 1996). In this study, to evaluate the construct validity, the relationship between our scale, the W-DEQ, and other similar anxiety, fear and worry scales completed at the same time, the BAI scores, DASS and BMWS, were all analysed using Pearson's correlation coefficient. Higher correlations were expected between dimensions that measure the same fear of childbirth aspects. The construct validity coefficients were accepted as: $r \geq 0.81$–1.0 excellent, 0.61–0.80 very good, 0.41–0.60 good, 0.21–0.40 fair and 0–0.20 poor (Feise & Menke 2001).

Construct validity was also determined utilizing the known-groups method. The known-groups method compares scale scores across groups known to differ in the fear construct being investigated (35–37). In this study, independent sample *t*-test was used to compare groups differing in known fear status (nulliparous women and parous women) on the W-DEQ scale.

Statistical analysis

To proceed with the statistical analysis, the 6-point Likert scales for the 14 negative items were recoded as −2 (no distress), −1 (little distress), 1 (some distress) and 2 (a lot of distress). All items were coded and scored, and the completed questionnaires were included in the data analysis. Individual unanswered items were excluded from the analysis. Double data entry was carried out with a subsequent validation to guarantee the quality and consistency of the data. Statistical analyses of the data obtained were performed using SPSS for Windows version 13.0 (SPSS, Inc., Chicago, IL, USA) and the SAS statistical software (SAS Institute, Cary, NC, USA). Descriptive statistics (i.e. frequencies, means and standard deviations) were determined to characterize the demographic data of the patients. The Kolmogorov–Smirnov test was conducted to assess the distribution of the variables in order to use a parametric or non-parametric tests. The Pearson correlation coefficient was used to calculate the linear correlation of two continuous variables. Results for correlations are reported in terms of correlation *r* and *P*-value. For parametric continuous data, the Student's *t*-test assessed whether the means of two groups were statistically different from each other. A statistical significance level of $P < 0.05$ was used in all statistical tests performed, unless otherwise stated.

Results

Participants

The validity and reliability studies of W-DEQ were conducted on 660 pregnant women with gestational age ranging from 28 to 40 weeks. About forty-nine per cent (49.4%) of the pregnants were nulliparous ($n = 326$), and 50.6% were parous ($n = 334$). Table 1 shows the main sociodemographic characteristics of the study population by group (nulliparous group and parous group) who visited at Akdeniz University, Atatürk State and Antalya Research and Education Hospitals during the study period. Thirty-one per cent (30.6%) of the women's age ranged between 15 and 19, 25% were between 25 and 29 and 5.1% were between 35 and above. While 32.4% of them were in gestation week between 31 and 33, 47.3% were in gestation week between 34 and 37. With regard to educational level, 43.5% completed primary school, 44.8% completed a higher grade elementary or secondary school and 11.7% completed a higher education. While 81.4% of the pregnants in the research expressed that the father of the baby supported them both physically and emotionally during their gestation, 83.9% of them expressed that the baby is wanted by both herself and her partner. Two hundred and sixty-one women (39.5%) attended childbirth classes before the delivery (Table 1).

Item-total analysis

Item-total correlations of the W-DEQ versions A are obtained for the nulliparous and parous women in gestation weeks between 28 and 40 and the results are presented in Table 2. In our analysis, the item-total correlations for the items were very high for most of the items. As can be seen, eight items in each group had an item-total correlation of less than 0.40 (after rounding to 0.40); the same six items in both group had an item-total correlations of less than 0.40. These items were tense, behave badly, let happen, lose control, dangerous and child will die. It can be easily seen that item-total correlations of the W-DEQ in nulliparous and parous women were generally the same, i.e. the 10 highest item-total scores of the items were almost the same in both groups. However, as can be noticed, the ranking of these 10 items differed in two groups. The five highest ranked items in the nulliparous group (self-confidence, strong, safe, happy and trust) may be related with strong and self-confident personality and the five highest ranked items in the parous group are almost the same as in the nulliparous group with two exception (trust, self-confidence, happy, desolate, weak/afraid) expressing ambivalent emotions and self-confident. The item-total

Table 1
Sociodemographic characteristics of the study population by group (nulliparous group, parous group and combined group)

Sociodemographic data	Frequences of the sociodemographic data					
	Nulliparous group		Parous group		Combined group	
	n (326)	%	n (334)	%	n (660)	%
Age						
15–19	181	55.5	21	6.3	202	30.6
20–24	102	31.3	48	14.4	150	22.7
25–29	33	10.1	132	39.5	165	25.0
30–34	6	1.8	103	30.8	109	16.5
35 and above	4	1.2	30	9.0	34	5.1
Hospital						
Antalya Education and Research Hospital	118	36.2	102	30.5	220	33.3
Akdeniz University Hospital	104	31.9	116	34.7	220	33.3
Antalya Atatürk State Hospital	104	31.9	116	34.7	220	33.3
Gestational Age						
28–30 weeks	44	13.5	26	7.8	70	10.6
31–33 weeks	100	30.7	114	34.1	214	32.4
34–37 weeks	160	49.1	152	45.5	312	47.3
38 weeks and above	21	6.7	42	12.6	64	9.7
Education						
Primary school	153	46.9	134	40.1	287	43.5
Elementary or secondary	121	37.1	175	52.4	296	44.8
Higher education	52	15.9	25	7.5	77	11.7
Partner support						
Yes	288	88.3	249	74.6	537	81.4
No	27	8.3	24	14.7	76	11.5
Partial	11	3.4	36	10.8	47	7.1
Attendance in prenatal classes						
Yes	129	39.6	132	39.5	261	39.5
No	197	60.4	202	60.5	399	60.5
Source of education						
Health care personels	80	24.5	91	27.2	171	25.9
Books on pregnancy education	6	1.8	3	0.9	9	1.4
Internet	12	3.7	22	6.6	34	5.2
Television	17	5.2	2	0.6	19	2.9
Mother	2	0.6	8	2.4	10	1.5
Health care personels + Internet	12	3.7	6	1.8	18	2.7

correlations were lower for most of the items in the nulliparous group than in the parous group.

Reliability

The reliability estimates for the nulliparous and parous women are presented in Table 3. As can be seen from this table, the alpha coefficients are well above the 0.70 criterion for the internal consistency reliability. They are close to or higher than 0.90. There was no difference in the reliability estimates between the nulliparous and parous groups. The W-DEQ, BAI and BMWS scales had very similar Cronbach's alpha estimates, but the DASS scale had slightly higher estimates than the W-DEQ scale. All scales showed satisfactory internal consistency according to the standards recommended by Steiner and Norman (Streiner & Norman 1995). However, the W-DEQ and DASS scales were more internally consistent than the remaining measures.

Validity

Analysis of the construct validity of the W-DEQ version A was performed for both nulliparous and parous women separately and the results are illustrated in Table 4. All the scales in both groups showed a statistically significant correlation with the W-DEQ. The BAI and DASS scales showed moderate but statistically significant correlations (range 0.416–0.464) with the W-DEQ, with the BAI in the parous group having the highest correlation (0.464). However, the BMWS showed the lowest correlations (range 0.204–0.233) with the W-DEQ. The correlation between the W-DEQ and BAI were the highest in the combined groups, but the lowest between the W-DEQ and BMWS scales.

Table 5 shows intercorrelations in the nulliparous, parous and combined groups between the questionnaires measuring fear of childbirth and other questionnaires, BAI, DASS and BMWS. Generally, higher significant correla-

Table 2
Item-total correlations of the W-DEQ versions A in nulliparous and parous women in gestation weeks between 28 and 40

Item	Nulliparous group (n = 326)	Parous group (n = 334)	Combined group (n = 660)
1. Fantastic*	0.43	0.39	0.41
2. Frightful*	0.41	0.30	0.35
3. Lonely	0.46	0.46	0.46
4. Strong*	0.64	0.52	0.58
5. Confident	0.57	0.57	0.56
6. Afraid	0.52	0.61	0.56
7. Deserted	0.46	0.54	0.49
8. Weak	0.53	0.61	0.57
9. Safe*	0.62	0.59	0.61
10. Independent	0.44	0.46	0.44
11. Desolate	0.55	0.63	0.59
12. Tense	0.23	0.28	0.25
13. Glad	0.46	0.55	0.50
14. Proud	0.40	0.45	0.43
15. Abandoned	0.42	0.52	0.47
16. Composed*	0.56	0.45	0.51
17. Relaxed	0.48	0.56	0.51
18. Happy	0.59	0.64	0.61
19. Panic	0.33	0.38	0.35
20. Hopelessness	0.48	0.54	0.51
21. Longing for child*	0.47	0.46	0.46
22. Self-confidence	0.65	0.69	0.67
23. Trust	0.59	0.76	0.67
24. Pain	0.35	0.46	0.40
25. Behave badly	0.04	0.09	0.06
26. Let happen*	−0.05	−0.01	−0.03
27. Lose control	0.05	0.11	0.08
28. Funny	0.33	0.35	0.34
29. Natural	0.35	0.45	0.40
30. Obvious	0.37	0.38	0.38
31. Dangerous	−0.05	0.07	0.02
32. Child will die*	0.30	0.24	0.27
33. Child will be injured*	0.37	0.27	0.31

W-DEQ, Wijma Delivery Expectancy/Experience Questionnaire.
*significant difference between the group of the items, $P < 0.05$.

Table 3
Reliability estimates of four questionnaires in nulliparous and parous women. Cronbach's alpha estimates of W-DEQ version A, BAI, DASS and BMWS in nulliparous, parous and combined groups

	Nulliparous group (n = 326)	Parous group (n = 334)	Combined groups (n = 660)
W-DEQ version A			
Cronbach's alpha	0.88	0.90	0.89
BAI			
Cronbach's alpha	0.90	0.88	0.89
DASS			
Cronbach's alpha	0.96	0.95	0.96
BMWS			
Cronbach's alpha	0.89	0.88	0.89

BAI, Beck Anxiety Inventory; BMWS, Brief Measure of Worry Severity; DASS, Depression, Anxiety, Stress Scale; W-DEQ, Wijma Delivery Expectancy/Experience Questionnaire.

tions were seen when comparing the W-DEQ scale with the BAI and DASS scales, with a high validity to measure depression and anxiety. Lower significant correlations were seen when comparing the W-DEQ scale with the BMWS scale, with a high validity to measure the worry. It can be easily noticed that the correlation of the W-DEQ with the other questionnaires are similar for both the nulliparous and parous groups. Especially the DASS, having a good

reliability (>0.90, Table 4) gave almost the same correlations with other scales in both groups.

In this study, independent sample *t*-tests were used to compare the nulliparous and parous groups differing in known fear status. Table 6 presents the means and standard deviations of the W-DEQ scale for the nulliparous and parous groups, and the results of *t*-tests. In one quarter of the items, nulliparous women had statistically significant

Table 4

Pearson's correlation coefficients between W-DEQ version A and BAI, DASS, BMWS in a group of nulliparous and parous women during their gestation ages between 28 and 40 weeks of pregnancy

	W-DEQ version A Nulliparous group	W-DEQ version A Parous group	W-DEQ version A Combined group
BAI	0.418**	0.464**	0.439**
DASS	0.442**	0.416**	0.429**
BMWS	0.233**	0.204**	0.219**

BAI, Beck Anxiety Inventory; BMWS, Brief Measure of Worry Severity; DASS, Depression, Anxiety, Stress Scale; W-DEQ, Wijma Delivery Expectancy/Experience Questionnaire.
**$P < 0.01$.

Table 5

Intercorrelations in the nulliparous, parous and combined groups between the questionnaires measuring fear of childbirth and other questionnaires

	W-DEQ A			BAI			DASS		
	np ($n = 326$)	P ($n = 334$)	Combined ($n = 660$)	np ($n = 326$)	P ($n = 334$)	Combined ($n = 660$)	np ($n = 326$)	P ($n = 334$)	Combined ($n = 660$)
BAI	0.418**	0.464**	0.439**						
DASS	0.442**	0.416**	0.429**	0.762**	0.743**	0.750**			
BMWS	0.233**	0.204**	0.219**	0.455**	0.338**	0.418**	0.467**	0.422**	0.446**

BAI, Beck Anxiety Inventory; combined, combined group; DASS, Depression, Anxiety, Stress Scale; np, nulliparous group; p, parous group; W-DEQ, Wijma Delivery Expectancy/Experience Questionnaire.
**$P < 0.01$.

lower mean W-DEQ scores than parous women, while in one quarter of the items parous women had statistically higher mean W-DEQ scores. In the remaining half of the items there was no difference between these groups.

Discussion

Fear of childbirth is known to be multidimensional and the W-DEQ has been developed to measure women's feelings and fear about childbirth (Wijma *et al*. 1998). This scale has been factor analysed twice for non-Turkish-speaking women (Johnson & Slade 2002, Wiklund *et al*. 2008) and was found to measure four conceptually distinct dimensions. There is a need for such a scale designed to be used in non-English-speaking countries as different cultural groups may vary in the factor structures. It is clear that the scale cannot be transferred directly from one culture to another by a simple direct translation of a questionnaire without being revalidated for the new conditions. There is a well-documented sequential process of scale's adaptation for use in different cultures (Guillemin *et al*. 1993, Beaton *et al*. 2000) and it is well known that the translation must be validated to achieve an equivalent scale and to allow comparability of data. In the current study, the adaptation of the W-DEQ scale for the Turkish language has produced an instrument that demonstrates its reliability and validity.

One aim of the study was to investigate and validate the psychometric properties of the Turkish version of the W-DEQ scale in pregnant Turkish women. The total number of 660 participants used in the current study was sufficient for reliable results for this aim. No systematic

dropout of women occurred during the investigation, which made the sample representative of the population of pregnant Turkish-speaking women in the community of southern part of Turkey. Scores on the W-DEQ were normally distributed. A significant strength of the present study is the 100% response rate compared with the 84% response rate in the Swedish study (Ryding *et al*. 1998) and 35% in the British study (Johnson & Slade 2002). In these studies, a response bias may have occurred, as participants chose to respond to a postal questionnaire. Because our study was carried out on a face-to-face clinic-based recruitment, the likelihood of such a response bias has been eliminated. Without any doubt the representativeness of pregnant women who are afraid of giving birth with high response rate is other strength of the present study. However, there are some problems of face-to-face administration in terms of social desirability.

The findings reported here suggest that the W-DEQ could offer a valid, reliable and useful instrument wherever a brief, simple method of measuring the fear of childbirth, as in this type of population, is needed.

Reliability was assessed in terms of internal consistency (Cronbach's alpha coefficient) for the Turkish version of the scale in this study. Both in nulliparous and parous women, the W-DEQ appears to have a high reliability, comparing well with previous reliability estimates. One measure of reliability, the Cronbach's alpha coefficient of internal consistency, requires only a single administration of the instrument. For internal consistency, our results suggested that the Turkish version of the questionnaire has satisfactory internal consistency and Cronbach's alpha for the Turkish

Table 6
Distribution of the item statistics of W-DEQ version A in nulliparous and parous

Items	Parous group (n = 334)		Nulliparous group (n = 326)		t-test	
	Mean	SD	Mean	SD	t-value	Sig.
1. Fantastic	3.74	0.975	3.84	1.046	−1.283	0.200
2. Frightful	3.46	1.282	3.70	1.372	−2.365	0.018
3. Lonely	2.76	1.323	2.57	1.521	1.713	0.087
4. Strong	2.78	1.253	3.07	1.383	−2.787	0.005
5. Confident	2.70	1.238	2.99	1.327	−2.937	0.003
6. Afraid	3.04	1.347	3.46	1.373	−4.006	0.000
7. Deserted	2.43	1.259	2.09	1.374	3.336	0.001
8. Weak	2.62	1.486	2.65	1.496	−0.315	0.753
9. Safe	2.73	1.210	2.67	1.370	0.645	0.519
10. Independent	2.74	1.291	2.95	1.287	−2.106	0.036
11. Desolate	2.46	1.323	2.44	1.430	0.153	0.879
12. Tense	3.55	1.320	3.71	1.439	−1.467	0.143
13. Glad	2.60	1.001	2.64	1.222	−0.383	0.702
14. Proud	2.29	1.146	2.30	1.316	−0.107	0.915
15. Abandoned	2.27	1.433	1.99	1.524	2.421	0.016
16. Composed	2.94	1.242	2.88	1.510	0.556	0.578
17. Relaxed	3.37	1.353	3.48	1.545	−1.030	0.303
18. Happy	2.46	1.164	2.18	1.206	3.035	0.002
19. Panic	3.01	1.297	3.36	1.411	−3.319	0.001
20. Hopelessness	2.39	1.265	2.16	1.333	2.241	0.025
21. Longing for child	2.30	1.205	2.02	1.178	3.029	0.003
22. Self-confidence	2.54	1.263	2.62	1.119	−0.811	0.418
23. Trust	2.63	1.249	2.52	1.266	1.095	0.274
24. Pain	3.28	1.222	3.49	1.416	−2.035	0.042
25. Behave badly	1.52	1.073	1.44	1.148	0.951	0.342
26. Let happen	1.54	1.222	1.52	1.418	0.199	0.843
27. Lose control	1.53	1.133	1.23	1.064	3.539	0.000
28. Funny	2.35	1.274	1.97	1.266	3.915	0.000
29. Natural	1.99	1.089	1.74	1.029	2.941	0.003
30. Obvious	1.96	1.020	1.82	1.094	1.691	0.091
31. Dangerous	1.45	1.295	1.26	1.189	1.883	0.060
32. Child will die	2.11	1.071	2.30	1.251	−2.162	0.031
33. Child will be injured	2.07	1.091	2.33	1.163	−2.921	0.004

W-DEQ, Wijma Delivery Expectancy/Experience Questionnaire.

version of the W-DEQ was similar to the results of the developers of the scale in addition to the results of the British version (Wijma *et al*. 1998, Johnson & Slade 2002). Cronbach's alpha coefficient of 0.89 observed in our study for the combined group demonstrates a very high internal consistency of the scale. There was no difference in the reliability estimates between the nulliparous and parous groups (0.88 for nulliparous, 0.90 and for parous and 0.89). Previously reported alpha coefficients ranged from 0.91 to 0.94 (Wijma *et al*. 1998, Johnson & Slade 2002, Heimstad *et al*. 2006).

The construct validity of the Turkish version of W-DEQ was assessed by the Pearson's correlation coefficients and known-groups method. The results of validity analyses show that the scale correlates at an expected level with other measures of anxiety, depression and worry scales and discriminates between groups differing in known fear status, nulliparous and parous women, on the W-DEQ scale. The analysis conducted to examine the criterion-related validity of the Turkish W-DEQ revealed a strong association between BAI, DASS and BMWS. All these scales in groups showed a significant correlation with the W-DEQ. As Polit and Hungler suggested, known-group method was applied in order to examine construct validity of the W-DEQ (Polit & Hungler 2006). In one quarter of the items, nulliparous women had statistically significant lower mean of W-DEQ scores than the parous women.

Conclusions

The results reported here confirm the reliability and validity of the W-DEQ questionnaire in Turkish pregnant women. The results of our study show that the W-DEQ as a short, easy to administer questionnaire has been translated into Turkish without losing the psychometric properties of the original English version. Our study suggests that the Turkish version of the W-DEQ has good comprehensibility, internal consistency, and validity and is an adequate and useful instrument for the evaluation of fear of childbirth in Turkish pregnant women. The use of it can be recommended in clinical settings and future outcome studies in Turkish-speaking pregnant women. The Turkish

version of the W-DEQ questionnaire will also increase the comparability of studies conducted in Turkey- and in English-speaking countries and facilitate international collaboration in this field.

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