Construct and content validity of the Turkish-Birth Satisfaction Scale-Revised (T-BSS-R)

Abstract

Background: The Birth Satisfaction Scale-Revised (BSS-R) is a valid and reliable scale designed to assess women's experiences of labour and childbirth.

Objective: To assess factor structure, validity, and reliability of the Turkish-Birth Satisfaction Scale-Revised (T-BSS-R) using data collected from a Turkish population.

Setting: Istanbul Ministry of Health Zeynep Kamil Women's and Children's Training and Research Hospital.

Participants: A convenience sample of healthy childbearing women (n=120) who had experienced a Spontaneous Vertex Delivery (SVD) at full term.

Method: A survey was conducted post back translating the T-BSS-R, with survey data analysed using Confirmatory Factor Analysis (CFA).

Results: Factor modelling found three sub-scales embedded in the T-BSS-R, which indicated a good model fit, $\chi 2 = 44.67$, CFI = .94; RMSEA = .057; SRMR = .075. A Chi-square value of 1.33 also indicated a good fit. Means for the T-BSS-R sub-dimensions (1) Stress Experienced (T-BSS-SE-R) = (6.86 ± 3.10), (2) Women's Attributes (T-BSS-WA-R) = (2.84 ± 1.89), (3) Quality of Care (T-BSS-QC-R) = (10.69 ± 3.19), and total scale = (20.39 ± 5.98). The Cronbach alpha coefficient for total scale = (0.71), and for sub-dimensions T-BSS-SE-R = (0.55), T-BSS-WA-R = (0.44) and T-BSS-QC-R =- (0.74).

Conclusion: Data analysis determined that the T-BSS-R is a valid and reliable instrument to measure birth satisfaction in a population of Turkish women. The T-BSS-R is available for use from c.hollinsmartin@napier.ac.uk.

Key words: Assessment, Birth Satisfaction Scale-Revised (BSS-R), childbearing, midwifery, Turkey

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Introduction

Childbirth is one of the most significant events in a woman's life, and therefore it is important for healthcare services to provide a good experience amidst safe conditions (Altıparmak & Coşkun, 2016). Across the years, progressive developments in healthcare have organised a safer environment, which has freed some attention towards optimising women's experiences and satisfaction with the birth process. Prior evaluations of maternity services have measured maternal and neonatal perinatal morbidity and mortality rates, (Sawyer et al., 2013) with the new psychosocial criterion of 'birth satisfaction' now an incorporate goal of maternity care provision (Tingstig, Gottvall, Grunewald, & Waldenström, 2012). It is now important to:

1) Provide the best possible outcomes for both mother and baby.
2) Minimise interventions during the normal birth process.
3) Afford the highest possible consumer satisfaction with services provided.

Measuring 'birth satisfaction' tells us how a woman feels about her birth experience, which requires the midwife to take into consideration her personal wants and needs within confines of safety and cost (Güngör, 2009; C. H. Martin & Fleming, 2011; Özcan & Aslan, 2015). Markers of 'birth satisfaction' for example include (Hollins Martin & Martin, 2014; Hollins Martin & Fleming, 2011):

- Considering person-centred preparation for childbirth.
- Providing respect and support throughout the birth process.
- Maintaining open and honest communication.
- Affording a comfortable environment in which the woman is less likely to lose control.
- Offering acceptable methods of pain relief.
- Minimising obstetric injury.
- Helping the woman to give birth in her desired position (Hollins Martin & Martin, 2014; Hollins Martin & Fleming, 2011).

Levels of 'birth satisfaction' can affect mental health of both mother and infant, with a negative experience having potential to; reduce mother-infant attachment, willingness to breast-feed, instigate sexual dysfunction, infant neglect/abuse, Post Natal Depression (PND), Post-Traumatic Stress Disorder (PTSD), request for future elective Caesarean Section (CS),

request for sterilisation and/or abortion (Dencker, Taft, Bergqvist, Lilja, & Berg, 2010; Güngör, 2009; Sawyer et al., 2013).

The World Health Organization (WHO) determined that an acceptable cesarean rate is 15%. The rate is as approximately 53% in Turkey, compared with a rate of 15% in Holland and 20% in France (Workshop on the Evaluation of Delivery Method Preferences, Presidency of Health Institutes of Turkey, 2017, Ankara, Turkey). Evaluating birth satisfaction of women and carrying out further studies to increase birth satisfaction level may effectively reduce cesarean section rates.

Birth satisfaction is influenced by social and cultural structure of regions. The adaptation of the scale into Turkish will reveal factors that effect birth satisfaction in Turkish society. In addition, the differences in Turkish culture can be compared with other countries. Sociodemographic characteristics, expectancy of pregnant women, prenatal education, organization of service delivery, communication with health workers, quality of midwifery care, applied medical treatment and initiatives, pain control and support, adequate information and participation in decisions, postnatal care, continuity of care and early discharge were all found to effect birth satisfaction in a Turkish population (Gungör 2009). Other factors that effect birth satisfaction are characteristics of the clinical area, aspects of service providers, and level of stress experienced (Gungör and Beji, 2012). Personal characteristics of childbearing women that affect birth satisfaction, include being educated about birth, ability to cope during labour, feeling in control, and infant condition. Personal characteristics of health personnel that are important, include protection of privacy, providing information, quality of care provided, continuity of care provider, and support provided (Gençalp 2001). Environmental and institutional factors that stress women during labour include; obstetric interventions and health of the newborn infant (Güngör 2009).

Instruments validated to collect data in specified populations (Gungor & Beji, 2012; Hollins Martin, Snowden, & Martin, 2012) are required to assess puerperal women's levels of 'birth satisfaction', from which improvements can be measured. Currently, there are limited methods of measuring 'birth satisfaction' in Turkey, with need identified to produce a valid and reliable instrument (Apay & Arslan, 2009).

It was recognised that one method of producing a robust psychometric instrument to measure 'birth satisfaction' in Turkey, would be to translate a pre-existing international instrument, collect survey data from a cohort of Turkish puerperal women, and carry out psychometric

tests to evaluate scale robustness within this particular population. Such an approach would provide both Turkish understandings of 'birth satisfaction' and permit cross-cultural comparison to take place. With this in mind, the present study aimed to translate the Birth Satisfaction Scale–Revised (BSS-R) developed by Hollins Martin and Martin (2014), which is a robust psychometric instrument recommended by the International Confederation of Health Outcome Measures (ICHOM), and conduct validity and reliability tests on data collected from a cohort of puerperal Turkish women. The BSS-R is preferred due to its fast ability to collect data, its high Cronbach alpha value, and its adaptability to be translated into many different languages, which allows for cross-cultural data collection.

Method

A survey method was used, with the BSS-R (Hollins Martin & Martin, 2014) first back translated and data collected and validated using Confirmatory Factor Analysis (CFA). Taking a prospective cross-sectional approach, key psychometric properties of the T-BSS-R were tested, which involved a sequential process of instrument evaluation using classical and contemporary psychometric approaches applied to a single cohort of Turkish childbearing women. The study was conducted between 1st January and 1st December 2015, with data collected in Istanbul at the Ministry of Health Zeynep Kamil Women's, and Children's Training and Research Hospital postnatal clinic. Ethics approval was acquired from the Istanbul Zeynep Kamil Training and Research Hospital Ethical Committee for Clinical Investigations (11391090-900-).

Language and content validity of scale

The back-translation method was used to determine language equivalence of the T-BSS-R. The UK English language version of the BSS-R (Hollins Martin & Martin, 2014) was initially translated into Turkish by a team of 4 academics who were proficient in English. The back translation of the scale from Turkish to English was conducted by a faculty member who was proficient in both languages, had previously given birth, and who had not previously read the UK English language version of the BSS-R (Hollins Martin & Martin, 2014). The back translated version was compared with the original scale statements and the T-BSS-R items finalised. To assess Content Validity Index (CVI), the draft T-BSS-R was sent to 11 academic experts who were nurses, midwives, and obstetricians working in a variety of universities. These assessors were asked to evaluate on a Likert scale each T-BSS-R item for appropriateness at measuring 'birth satisfaction' (Not appropriate = 1; It should be customized

= 2; Appropriate but small modifications needed = 3; Perfectly appropriate = 4). All scale items were scored with 3 or 4 points, which calculated to a CVI score of 100%. Post CVI, a pilot was conducted in which (n=20) puerperal women completed the T-BSS-R and provided feedback. All 20 pilot participants understood what each item on the scale was asking and gave feedback on processes of administration. At this point the draft T-BSS-R was officially named the T-BSS-R.

Participants

Participants were a convenience sample of Turkish speaking, consenting, healthy, low risk childbearing women (n=120), all of whom had experienced a Spontaneous Vertex Delivery (SVD). For factor analysis to be effective, sample sizes require to be 10 times larger than the number of items on the scale. Since the T-BSS-R contains 10 items, a minimum of 100 survey completions was required. Mean age of women recruited was 26.9 years, with mean Body Mass Index (BMI) = 28.15 kg/m^2. The majority of participants were educated to primary school level (65%), were unemployed outside the home (85%), and lived in urban areas (48.3%). Obstetric characteristics found a mean gravida of 2.19 ± 1.31 and mean parity of 1.90 ± 1.02, with 40% of the participants' primigravidas and 60% multiparous.

Data collection instruments

The 30-item Birth Satisfaction Scale (BSS) developed by Hollins Martin and Fleming (2011) was psychometrically validated by Hollins Martin and Martin in 2014, and resulted in production of the valid and reliable10-item Birth Satisfaction Scale-Revised (BSS-R). When completing the scale, participants respond to items on a Likert scale that accumulates to a total score of 40, with 40 representing highest possible level of birth satisfaction that can be measured and 0 the lowest (Table 1).

Table 1. Valid and reliable *10-item-Birth-Satisfaction-Scale-Revised (10-item-BSS-R)* post psychometric statistical testing (Hollins Martin & Martin, 2014)

- Quality of care provision (4-items)
- Women's personal attributes (2-items)
- Stress experienced during labour (4-items)

(1) I came through childbirth virtually unscathed.
(2) I thought my labour was excessively long.
(3) The delivery room staff encouraged me to make decisions about how I wanted my birth to progress.
(4) I felt very anxious during my labour and birth.
(5) I felt well supported by staff during my labour and birth.
(6) The staff communicated well with me during labour.
(7) I found giving birth a distressing experience.
(8) I felt out of control during my birth experience.
(9) I was not distressed at all during labour.
(10) The delivery room was clean and hygienic.

Participants respond on a 5-point Likert scale based on level of agreement/disagreement with each of the statements placed, with a possible range of scores between 0-40. A score of 0 on the BSS represents least 'birth satisfaction' and 40 most.

- Strongly Agree
- Agree
- Neither Agree or Disagree
- Disagree
- Strongly Disagree

To obtain a copy of the *10-item-BBS-R* and marking grid contact Prof Caroline J Hollins Martin.
Email: c.hollinsmartin@napier.ac.uk

The scale has 3 sub-dimensions called (1) Quality of care provision (4-items), (2) Women's personal attributes (2-items), and (3) Stress experienced during labour (4-items) (Hollins Martin et al., 2012). To predict criterion validity of the translated T-BSS-R, a Visual Analogue Scale (VAS) and 'the Scale for Measuring Maternal Satisfaction in Normal Birth (SMMS)' scale were utilized. We used the Scale for Measuring Maternal Satisfaction in Normal Birth (SMMS) since it is the only developed tool so far that has been designed to measure birth satisfaction in Turkey. The SMMS-normal birth scale was developed by Güngör and Beji (2009) and consists of 43 items divided into 10 sub-dimensions that assess maternal satisfaction following normal birth. Participants respond to the SMMS-normal birth scale on a Likert-type scale that scores responses on a range 'I do not agree (1 point)' to 'I completely agree (5 points).' Minimum score that can be achieved is 43 and maximum 215, with 215 representing highest level of satisfaction (Gungor & Beji, 2012; Güngör, 2009).

Data collection

Data was collected from participants within the first three days post delivery at the postnatal clinic. An information sheet, consent form, and the T-BSS-R were issued during a meeting in

which questioning was encouraged. Informed consent was provided, with confidentiality and anonymity assured.

Statistical analysis

NCSS (Number Cruncher Statistical System) 2007 software (Kaysville, Utah, USA) (License No:1675948377483; Serial No: N7H5-J8E5-D4G2-H5L6-W2R7) was used for statistical analysis. The analysis processes used on data collected using the T-BSS-R can be viewed in (Table 2). Level of significance was accepted as $p < 0.05$.

Table 2. Analysis processes used on data collected using the Turkish- Birth Satisfaction Scale-Revised (T-BSS-R)

Data Analysis	**Statistical Methodology**
Descriptive information about puerperal women	Number, percentage, mean, standard deviation, median, frequency, ratio, minimum, maximum
Validity Analysis	
Language Validity	Translation – Back Translation
Content Validity	Content Validity Index (CVI)
Structural Validity	Factor Analysis
Criterion Validity	Pearson Correlation Coefficient Spearman's Correlation Coefficient
Reliability Analysis	
Internal Consistency Analysis	Cronbach Alpha Coefficient Calculation

Results

Validity of T-BSS-R

Structural validity of T-BSS-R

Factor analysis was used to assess structural validity of the T-BSS-R by determining whether scale items could be classified under different dimensions. Confirmatory Factor Analysis (CFA) (Aksayan & Gözüm, 2003) with robust maximum likelihood estimation was used to examine the three-factor correlated model proposed by Hollins Martin and Martin (2014). Consistent with Hollins Martin and Martin (2014), this model was hypothesised to comprise correlated factors of Stress (4-items), Quality of Care (4-items), and Women's attributes (2-items). Model fit was examined using a non-significant $\chi 2$, comparative fit index (CFI) $\geq$ 0.95, root mean square error of approximation (RMSEA) $\leq$ 0.080 and standardised root mean square residual (SRMR) $\leq$ 0.080 (Schreiber, Nora, Stage, Barlow, & King, 2006). The three-factor correlated model indicated a good model fit, χ 2 = 44.67, CFI = .94; RMSEA = .057; SRMR = .075. The standardised factor loadings for the T-BSS-R factor matrix can be viewed

in Table 1. The RMSEA was lower than .08, which indicates a good fit of the data. The comparative fit index within the .90–.95 range indicates that the model is satisfactory. The SRMR was less than .08, which also indicates good model fit (Schreiber et al., 2006). Corrected chi-square value was 1.33 and also indicated a good fit. The results showed that the study data had acceptable fit and the three-dimensional model was statistically significant and valid ($p = 0.050$; $p \leq 0.05$). Scale sub-dimensions were based on the three-factored structure determined in the factor analysis, and also the theoretical integrity and expert opinion included in the present study. The sub-dimensions include (1) Stress experienced, (2) Quality of Care, and (3) Women's attributes. The questions constructing the 3 subscales of the T-BSS-R can be viewed in *Table 3,* which displays the standardized loads according to the CFA results.

Table 3. Standardized factor loadings of Turkish-Birth Satisfaction Scale-Revised (T-BSS-R)

Scale Items	**Sub-Dimension Factor Values**		
	1st Sub-Dimension Stress Experienced	**2nd Sub-Dimension** Quality of Care	**3rd Sub-Dimension** Women's Attributes
5. I felt that I had excellent support from the delivery room staff during labour and delivery		0.97	
6. The delivery room staff communicated with me satisfactorily during labour		0.75	
3. The delivery room staff encouraged me to participate in the decisions during the delivery process		0.70	
10. The delivery room was clean and hygienic		0.41	
8. I felt that I lost control during delivery			0.60
4. I was very anxious during labour and delivery			0.66
9. I experienced no worries during labour	0.71		
7. I thought delivery was a worrying experience	0.87		
1. I experienced delivery almost without any damage	0.49		
2. I thought the labour was extremely long	0.26		

Criterion validity of T-BSS-R

Simultaneous validity was implemented to test criterion validity of the T-BSS-R, with correlations calculated the Scale for Measuring Maternal Satisfaction in Normal Birth (SMMS) (Gungor & Beji, 2012) and a Visual Analogue Scale (VAS) on which participants indicated

birth satisfaction on a scale of 1 to10. Correlations were calculated between the T-BSS-R, SMMS-normal birth, and VAS birth satisfaction scores. A highly significant correlation was found between the T-BSS-R and SMMS-normal birth total scores (r: 0,36, p:0,001), and a positive and statistically significant correlation was found with VAS total scores at a level of 36.0% (r: 0.360; p<0.01). These correlations validate that the T-BSS-R is a suitable instrument for collecting data from a Turkish cohort of puerperal women.

Reliability of T-BSS-R

Cronbach alpha's were calculated to assess internal consistency of the T-BSS-R, with high correlations between items indicating that sub-dimensions measure similar properties. A Cronbach alpha of .40 is the minimum acceptable criterion of scale internal reliability (Aksayan & Gözüm, 2003; Aslantekin, 2006; Erdoğan, Nahcivan, Esin, 2014; Şirin, 2011). Means for the T-BSS-R sub-dimensions (1) Stress Experienced (T-BSS-SE-R) calculated at 6.86 ± 3.10, (2) Women's Attributes (T-BSS-WA-R) = 2.84 ± 1.89, (3) Quality of Care (T-BSS-QC-R) = 10.69 ± 3.19, with total scale = 20.39 ± 5.98. Cronbach alpha coefficient for total scale was (0.71), and for sub-dimensions T-BSS-SE-R = (0.55), T-BSS-WA-R = (0.44), and T-BSS-QC-R = (0.74) (Table 4). Hence, the T-BSS-R was considered a reliable instrument for use in Turkish cohorts of puerperal women in terms of the total scale comprising all ten items.

Table 4: Internal Consistency Reliability Coefficients for Turkish-Birth Satisfaction Scale-Revised (T-BSS-R) and Sub-Dimensions

	Number of Questions	Min-Max	$\bar{x}$ ± SD	Cronbach's Alpha
T-BSS-SE-R*	4	0-14	6.86±3.10	**0.558**
T-BSS-WA-R**	2	0-8	2.84±1.89	**0.442**
T-BSS-QC-R***	4	1-16	10.69±3.19	**0.747**
BSS-TOTAL	10	6-37	20.39±5.98	**0.712**

** Turkish version of the Birth Satisfaction Scale- Revised Stress Experienced Sub-Dimension*
***Turkish version of the Birth Satisfaction Scale- Revised Women's Attributes Sub Dimension*
****Turkish version of the Birth Satisfaction Scale- Revised Quality of Care Sub-Dimension*

Cut off scores

Participants responded to items on the T-BSS-R on a Likert scale that accumulates to a total score out of 40, with 40 representing the highest possible level of birth satisfaction and 0 the

lowest. In the present study, scale cut off scores were calculated by dividing the total score into three equal parts:

- Low satisfaction < 13 points
- Moderate satisfaction 14 – 27 points
- High satisfaction ≥ 28 points

Discussion

This study was conducted to validate the English (UK) version of the BSS-R' devised by Hollins Martin and Martin (2014) and validate it for use in Turkish cohorts of puerperal women. Our construct validity findings are generally consistent with those of Hollins Martin and Martin's (2014) UK version, Greek version (Vardavaki, Hollins Martin, & Martin, 2015), and US version (Barbosa-Leiker, Fleming, Hollins Martin, & Martin, 2015), which together establish robustness of the original 10-item BSS-R (Hollins Martin & Martin, 2014) in terms of factor structure. Even though perception of care can be influenced by socio-cultural characteristics of participants, the T-BSS-R resulted in a good-fitting three-factor model (χ 2 = 44.67, CFI = .94; RMSEA = .057; SRMR = .075), which consists of a one order model of birth satisfaction that consists of 3 lower-order factors (1) Stress experienced, (2) Quality of Care, and (3) Women's attributes.

Simultaneous validity was implemented to test criterion validity of the T-BSS-R, with correlations calculated between the Scale for Measuring Maternal Satisfaction in Normal Birth (SMMS) (Gungor & Beji, 2012) and a Visual Analogue Scale (VAS), with highly significant correlations found which validate that the T-BSS-R is a suitable instrument for collecting data from Turkish cohorts of puerperal women. An increase in Cronbach alpha coefficient equates with an increase in internal consistency, with it reported in the literature that a Cronbach alpha coefficient between 0.60 and 0.80 is reliable (Aksayan & Gözüm, 2003; Erdoğan, Nahcivan, Esin, 2014). The Cronbach alpha of total scale was (0.71), and subscales T-BSS-SE-R (0.55), T-BSS-WA-R (0.44) and T-BSS-QC-R (0.74) (Table 4).

In Turkey, some of the women felt that they were not socially supported by the staff of the delivery room. Nonetheless, in general the Turkish women showed a great deal of respect to staff, which was evidenced by the high score for the item #5. Unnecessary routine practices in childbirth in Turkey are quite common (e.g., routine episiotomy & induction at birth) (Yıldırım-Rathfisch & Güngör 2009), which are events that can arouse a stress reaction. The low score for item # 2 may also be attributable to practices such as amniotomy, induction and

episiotomy, which are often applied to accelerate birth in Turkey. (Yıldırım-Rathfisch & Güngör 2009).

There are some limitations of this study. For example, collecting a total number of (n=120) (10-item) T-BSS-R scales could be perceived as limited in terms of numbers. Nonetheless, this sample size of (n=120) is considered sufficient by Child. (Child, 1990) who states that the total sample size should be 10 times larger than the number of items on the scale, or arguably 5 times larger than the number of items on the scale, (Öner, 2006) or no less than 100 total scales gathered (Hatcher, 1994; Kline, 2000). Within these contexts, (n=120) scales is considered enough, with further future data collection from larger numbers of Turkish cohorts further authenticating results. The data was collected within the first three days post delivery, which is a time that women may be affected by the variables such as the baby blues, anxiety, and reflection on negative events that happened during childbirth. It is however useful to use the scale to measure these situations in further Turkish studies.

Overall results demonstrate that the T-BSS-R is a valid and reliable tool for measuring 'birth satisfaction' in Turkish puerperal women. Consequently, the scale now available for use to evaluate services and carry out further research on what psychosocially works or does not work in terms of 'birth satisfaction' when delivering intranatal care. Assessing 'birth satisfaction' is critical to ensure delivery of a reasonable standard of maternity care provision. Measuring improvements in intranatal services is recommended, with routine assessment of women's 'birth satisfaction' carried out by health care professionals, managers, and administrators (Cosar Cetin, 2015; Göncü, 2015; Marín-Morales, Javier Carmona-Monge, Peñacoba-Puente, Olmos Albacete, & Toro Molina, 2013). At an international level, comparisons of US, UK, Turkish etc. 'birth satisfaction' will in the future help evaluators better understand cultural differences as regard delivery of intranatal services around the world. (C. R. Martin, Vardavaki, & Hollins Martin, 2016) It is anticipated that many additional countries will validate their own back translated language versions of the original UK scale, (Hollins Martin & Martin, 2014) which is available from c.hollinsmartin@napier.ac.uk.

Conclusion

The T-BSS-R can now be considered a psychometrically valid and reliable 10-item multi-dimensional self-report measure of 'birth satisfaction', specifically designed for use in

maternity care and perinatal settings in Turkey. The T-BSS-R is a back translation of the original BSS-R developed by Hollins Martin and Martin (2014), which is a psychometrically valid and reliable 10-item multi-dimensional self-report measure of birth satisfaction, specifically designed for use in maternity care and perinatal settings in the UK. Importantly, out of all measures of birth satisfaction that are currently available, the BSS-R has been appraised by international opinion leaders and consequently is now endorsed by the International Consortium of Health Outcome Measurement (ICHOM) as the measure of choice to assess 'birth satisfaction', and is incorporated as a key measure to comprehensively assess birth outcomes worldwide within the ICHOM Standard Set for Pregnancy and Childbirth ("ICHOM Standard Set for PREGNANCY & CHILDBIRTH," 2016)

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