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Validity and reliability of the Turkish version of the City Birth Trauma Scale (CityBiTS)

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ABSTRACT

The City Birth Trauma Scale (CityBiTS) was developed to be consistent with the current Diagnostic and Statistical Manual of Mental Disorders-DSM-5. It has been used as a complementary instrument that measures the psychological trauma related to childbirth. The aim of this study was to investigate the validity and reliability of the Turkish version of the CityBiTS. This research is a methodological study. This study was conducted with 315 women who had 6-month-old infants from August to October 2018. The CityBiTS is a 29-item instrument that was developed according to DSM-5 criteria to assess childbirth-related Post-Traumatic Stress Disorder. Test-retest measurements were performed at two-week intervals to evaluate the invariance of the scale over time. Cronbach's alpha coefficient of reliability was used to analyse internal consistency of scale. Cronbach's alpha coefficients were .76 for re-experiencing symptoms, .57 for avoidance symptoms, .77 for negative cognitions and mood, .83 for hyperarousal and .82 for dissociative symptoms. In conclusion, The Turkish version of the CityBiTS, as an instrument developed to be consistent with DSM-5 criteria in assessing childbirth-related trauma symptoms, is a valid and reliable tool.

KEYWORDS

Validity; reliability; birth; PTSD; trauma

IMPACT STATEMENT

- **What is already known on this subject?** One of the possible barriers for this is the lack of validated questionnaires that measure the postpartum PTSD.
- **What do the results of this study add?** The aim of this study was to investigate the validity and reliability of the Turkish version of the CityBiTS. The City Birth Trauma Scale has good psychometric properties and the two symptom clusters identified are consistent with previous research on symptoms of postpartum PTSD.
- **What are the implications of these findings for clinical practice and/or further research?** The City Birth Trauma Scale provides with a measure of birth-related PTSD for use in research and clinical practice.

Introduction

Childbirth is one of the most important milestones during a woman's lifetime. Many factors can make childbirth a stressful and traumatic experience. These factors are before/during pregnancy, a history of trauma, inadequate support during childbirth, experiencing the birth alone, inability to cope with labor pain, feelings of losing control, obstetric interventions, fear of losing the baby, maternal or neonate complications, etc. (Gulec et al. 2014; Reed et al. 2017; Weeks et al. 2017; Yıldız et al. 2017a, 2017b; Ayers et al. 2018).

After a traumatic childbirth experience, mothers have an increased risk of developing a psychiatric condition, such as Post-Traumatic Stress Disorder (PTSD) (Ayers 2017; Stramrood and Slade 2017). Factors such as psychological trauma before the age of 15, insufficient social support, anxiety/depressive disorder history, etc., are important in the aetiology of PTSD.

The occurrence of a complication during birth, life-threatening events such as stillbirth, bleeding (Maggioni et al. 2006; Polachek et al. 2012), loneliness at birth, obstetric interventions, fear of losing control at birth, etc. (Davey et al. 2005; Olde et al. 2006; Gulec et al. 2014) trigger postpartum PTSD development. PTSD is an anxiety disorder caused by very stressful, frightening or distressing events (American Psychiatric Association [APA] 2013). Experiencing a traumatic birth causes multifaceted adverse effects for mother, infant and family (Reed et al. 2017; Stramrood and Slade 2017).

A mother's mental health and relationships are negatively affected in after a traumatic birth experience (Ayers 2017; Yıldız et al. 2017a). Further, PTSD that cannot be diagnosed or treated has a negative impact on the mother's bonding with her baby. It is found that in the later years of a child's life, there is an increased risk of developed emotional, cognitive and behavioural problems. Moreover, the risk of postpartum depression

increases (Capik and Durmaz 2018; Stramrood and Slade 2017). A woman may be reluctant to have an other pregnancy, endure a normal labor or having a Pap smear or other screening and gynaecological check-ups in later years (Reed et al. 2017; Stramrood and Slade 2017).

It is reported that the prevalence of PTSD during postpartum period varies between 4% and 15.7% (Grekin and O'Hara 2014; Schepper et al. 2016; Stramrood and Slade 2017; Yıldız et al. 2017c). PTSD is included in the group under 'Trauma and stress-related disorders' in the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, APA 2013). There are different measurement tools that evaluate PTSD. These scales are namely Impact Event Scale (EIS-R) (Sundin and Horowitz 2002) prepared according to DSM-4, and Posttraumatic Diagnostic Scale (PDS-5) (Foa et al. 2016) based on DSM-5. It is revealed by literature review that the scales in studies assessing PTSD among Turkish women are parallel to the DSM-4-TR diagnostic criteria for PTSD. Several PTSD measurements have been developed for use in different populations, including postpartum women (Isbir et al. 2016; Yıldız et al. 2017b, 2017c). However, none of them are specifically designed to assess the birth-related PTSD based on DSM-5 criteria. Recently, the City Birth Trauma Scale (CityBiTS) was developed by Ayers et al. (2018) to specifically assess birth-related PTSD based on DSM-5 criteria for PTSD (Ayers et al. 2018). There are studies in the literature demonstrating that the CityBiTS has been validated (Handelzalts et al. 2018; Nakić Radoš et al. 2019). The validity and reliability of this scale have been made in Hebrew version (Handelzalts et al. 2018).

This study was conducted based on the thought that psychologically assessing women in the postpartum period would be beneficial. Therefore, the aim in this study was to adapt the CityBiTS to the Turkish language and culture, so that it can be used to assess PTSD after birth.

Methods and materials

This is a methodological study carried out with mothers who applied to a Family Health Center in Istanbul between August and October 2018. All mothers were in the sixth month of the postpartum period. A non-probability sampling technique was used. Women were included in the research if they met the following criteria: volunteer for participation, being able to understand and speak Turkish. There were no interviews with women such as psychotic disorder, mental problem, blind, deaf, speech handicapped and taking cancer treatment. Data were collected with the self-report method in the interview room allocated in the clinic, protecting the privacy of the women. Sample size was determined based on a formula of 10 times the number of scale items (Erdogan et al. 2014). Although the initial plan was to include 290 individuals in the sample, this number was raised to 315 to cover possible dropouts. Thus, the study was ultimately conducted with a group of 315 women. Twenty women who did not answer all of the questions were excluded from the research.

Data were collected using the CityBiTS, and a descriptive information form was developed by the researchers. *The Descriptive Information Form*: This form includes items about

sociodemographic (age, education, marital status, etc.) and obstetrics (mode of delivery, interventions at birth, etc.) characteristics of participants. *The City Birth Trauma Scale*: This scale is used to assess the symptoms of PTSD and diagnostic criteria in the postpartum period. Permission has been taken from Susan Ayers, who had developed the scale, prior to adapting it into the Turkish language. The scale is a four-point Likert-type instrument composed of 29 items. The CityBiTS evaluates symptoms of stress (items 1–2), re-experiencing (items 3–7), avoidance (items 8–9), negative cognition and mood (items 10–16) and hyperarousal (items 17–22). The scores pertaining to items 3–22 range from 0 to 60. Higher scores reflect greater risk for PTSD. Additionally, items 23 and 24 of the scale focus on the dissociative symptoms. For item 25, a score of '0' indicates the onset of PTSD prior to birth and a score of '2' indicates delayed-onset PTSD. Item 25 is a prevalence criterion. The duration of the symptoms is represented in item 26. While symptoms of distress and impairment are assessed in item 27 and item 28, the last item of the scale (item 29) relates to the exclusion criteria for PTSD. According to the City Birth Trauma Scale Assessment of Diagnostic Criteria DSM-5, it is given in Table 1.

Approval for the study was obtained from the Ethics Board of***University Health Sciences Institute (Date: February 5, 2018-Number: 41). After verbal consent was obtained from women who met the criteria, the purpose and methodology of the study were explained. Participants were also informed that they could withdraw from the study at any time they wished.

Data were analysed using SPSS version 21 (SPSS Inc., Chicago, IL, USA) and SPSS Amos (Analysis of Moment Structures) version 23. Test-retest methodology was used to assess the consistency over time, and Pearson's correlation coefficient was calculated. For evaluating the internal consistency and item-total correlation coefficients, Pearson's moment correlation coefficient was used. Cronbach's alpha reliability coefficient was performed to find the coefficient of internal consistency. The Lawshe technique was used to examine the opinions of experts on content validity. Further, an exploratory factory analysis (EFA) and a confirmatory factor analysis (CFA) were used to assess construct validity.

Results

All women included in the study are Turkish. The mean age of the women in the study was 28.97 ± 5.03 (min:17, max:43); more than half (66%) had educated over 8 years or longer. All women are married and gestational week is 39.04 ± 1.10 (min: 36.10–max: 42.00). Comparison of other characteristics of the participants with CityBiTS scores is given in Table 2.

Linguistic equivalence, content validity analysis

To evaluate the content validity of the instrument, the original version of the CityBiTS was translated into Turkish version by a psychiatric nurse and lecturer, an obstetrics and gynaecology nurse and lecturer, and an English instructor.

The researchers reviewed the translated scale and collaborated in generating a Turkish form of text. A Turkish teacher

Table 1. Assessment of the City Birth Trauma Scale according to DSM-5 Diagnostic Criteria.

[A] Stressor Criterion	:Women fulfil DSM-5 criterion A if they respond yes to Q1 or Q2
[B] Re-experiencing symptoms (1 needed):	Women score 1 or more on any question from Q3 to Q7 inclusive
[C] Avoidance symptoms (1 needed)	:Women score 1 or more on Q8 or Q9.
[D] Negative cognitions and mood (2 needed):	Women score 1 or more on 2 questions from Q10 to Q16 inclusive
[E] Hyperarousal (2 needed)	:Women score 1 or more on 2 questions from Q17 to Q22 inclusive
[F] Duration	:Women score 1 or more on Q26
[G] Distress and impairment	:Women score 1 or more on Q27 or Q28
[H] Exclusion criteria	:If women score 1 or more on Q29 then exclude them from diagnostic PTSD

PTSD with dissociative symptoms: Q23 and Q24 measure dissociative symptoms so if women score 1 or more on either of these questions the diagnosis should be 'PTSD with dissociative symptoms'.

PTSD with delayed onset: Score of 2 on Q25 means PTSD with delayed onset.

Table 2. Comparison of participants' characteristics and CityBiTS scores ($n = 315$).

Characteristic	%	<i>n</i>	CityBiTS Mean \pm SD	<i>p</i> Value
Family type	85	264	10.31 \pm 9.81	.002*
Small family				
Big family	15	47	15.40 \pm 12.92	
Financial status				
Sufficient income	14.4	44	7.31 \pm 7.09	.007**
Income equal to expenditure	67.8	212	10.87 \pm 10.27	
Insufficient income	17.8	55	15.21 \pm 12.11	
History of abuse				.000*
No	92.1	288	10.46 \pm 9.95	
Yes	7.9	24	19.00 \pm 13.32	
History of psychiatric medication				.000*
No	94.3	294	10.39 \pm 9.85	
Yes	5.7	17	23.17 \pm 13.73	
Type of delivery				.005*
Normal delivery	62.5	193	9.69 \pm 8.78	
Planned C-S	27.9	86	11.93 \pm 11.77	
Emergency C-S	9.6	30	17.93 \pm 13.35	
Continuous urinary catheterisation				.002*
No	57	176	9.52 \pm 8.93	
Yes	43	135	13.17 \pm 11.95	
Maternal complications				.001*
No	93.6	290	10.92 \pm 10.24	
Yes	6.4	20	18.95 \pm 11.29	
Newborn complications				.000*
No	87.6	274	10.18 \pm 9.75	
Yes	12.4	38	17.86 \pm 12.93	

*Student's *t* test, **one-way ANOVA test.

then evaluated the text for linguistic suitability and comprehensiveness. In the next stage, the Turkish version of the scale was blindly translated back into English by two individuals, namely a lecturer who had completed the doctorate study and lived abroad, and an individual who was studying and living abroad. The scale was then re-translated into Turkish by a lecturer. By this version, it was checked out whether it had changed the meaning of the original scale or not. Then, the final form of the scale was obtained.

Content analysis

After the linguistic equivalence of the scale was tested, the Turkish version was submitted to 11 experts for the analysis of content validity. The experts were asked to score each item on a scale between 1 and 5 (1 point: Inappropriate; 2 points: Slightly appropriate; 3 points: I'm undecided; 4 points: Appropriate; 5 points: Very appropriate). The differences in experts' opinions were examined using the Lawshe technique, and the data obtained from the experts were analysed using

the content validity index (CVI). Ultimately, the CVI for the items was found to be 83%. Once the evaluations of the experts were obtained, the agreed-upon final scale was administered to 20 participants outside of this sample in a pilot study.

Item analysis

When total score correlations of the 20 items were examined for the reliability testing of the CityBiTS, the reliability coefficient was found to vary between 0.32 and 0.74. It was found that there was a positive and statistically significant correlation between the item scores and the overall scale score ($p < .001$) (Table 3).

It was shown by investigating the item-subscale total score correlations of each subscale of the CityBiTS that the reliability coefficients (Pearson's correlation) for the five items in the 'Re-experiencing' subscale were in the range of $r = 0.45$ to 0.70. Meanwhile, for the two items in the 'Avoidance' subscale, the reliability coefficients ranged from $r = 0.47$ to 0.70. Further, the reliability coefficients for the seven items in the 'Negative Cognition and Mood' subscale were between $r = 0.32$ and 0.72; for the six items in the 'Hyperarousal' subscale, coefficients ranged from $r = 0.41$ to 0.74; and lastly, for the 'Dissociative' subscale, coefficients ranged from $r = 0.60$ to 0.61. This shows that the correlation coefficients of all items have positive and statistically significant correlations ($p < .001$) (Table 3). As in the original scale, item analysis was not performed for items 1, 2, 26, 27, 28 and 29.

The internal consistency reliability coefficient

As a result of the reliability studies, Cronbach's alpha internal consistency coefficient of the scale was found as $\alpha = 0.76$ for the 'Re-experiencing' subscale; $\alpha = 0.57$ for the 'Avoidance' subscale; $\alpha = 0.77$ for the 'Negative Cognition and Mood' subscale; $\alpha = 0.83$ for the 'Hyperarousal' subscale; $\alpha = 0.82$ for the 'Dissociative' subscale (Table 3); and $\alpha = 0.91$ for the overall scale.

Test and retest

For testing the consistency over time of the Turkish version of the CityBiTS, 315 women who participated in the first evaluation were re-invited to the Family Health Center to get a second respond. It is recommended that the test should be 2 to 6 weeks between the first assessment and the second

Table 3. City Birth Trauma Scale Subscales Item-Subscale Total Score Correlations ($n = 315$).

Scale Subscales and Items	Item-Subscale Total Score Correlation Coefficients		Item-Total Score Correlation Coefficients		Cronbach's Alpha α
	r	p Value	r	p Value	
Re-experiencing the Birth					
Item 4	.77	.000	.63	.000	.76
Item 5	.62	.000	.57	.000	
Item 6	.64	.000	.45	.000	
Item 7	.75	.000	.62	.000	
Item 8	.78	.000	.70	.000	
Avoidance					
Item 9	.89	.000	.70	.000	.57
Item 10	.76	.000	.47	.000	
Negative Cognition and Mood					
Item 11	.43	.000	.32	.000	.77
Item 12	.69	.000	.66	.000	
Item 13	.73	.000	.72	.000	
Item 14	.70	.000	.65	.000	
Item 15	.66	.000	.59	.000	
Item 16	.69	.000	.62	.000	
Item 17	.59	.000	.50	.000	
Hyperarousal					
Item 18	.75	.000	.68	.000	.83
Item 19	.46	.000	.41	.000	
Item 20	.84	.000	.72	.000	
Item 21	.83	.000	.74	.000	
Item 22	.75	.000	.66	.000	
Item 23	.76	.000	.65	.000	
Dissociative symptoms					
Item 24	.91	.000	.60	.000	.82
Item 25	.92	.000	.61	.000	

assessment, and should be performed on a group of at least 30 people with similar characteristics to the sample group (Aksayan and Gözüml 2003; Tavsancıl 2014). In this study, 75 women (23.8% of the participants) came back to the Family Health Center two weeks later to respond to the questions on the scale.

The test-retest measurements made two weeks period were assessed with a Pearson's correlation and a t -test. When the correlation between the scores of the first and second administration of the CityBiTS, and its subscales were examined using Pearson's correlation analyses, it was found that the reliability coefficients for the difference between the two measurements of the scale ranged between .97 and .99. This demonstrates a strong, statistically significant correlation ($p < .001$).

When the mean scores of the participants at the two different time period were compared using the dependent-groups t -test, a statistically significant difference was not found between the mean scores ($p > .05$).

Construct validity

The first step in testing the construct validity of the CityBiTS was to implement an EFA. Since the CityBiTS in the study had 29 items, the factor analysis was performed on data represented 10 times larger the number of items ($n = 315$). To check out whether the data were suitable for factor analysis, the Kaiser-Meyer-Olkin (KMO) test was employed. Bartlett's test was used to determine the significance of the correlations between the variables to be analysed and to test the null hypothesis.

The Kaiser-Meyer-Olkin coefficient was found to be 0.90, and the chi-squared value in the Bartlett's test was ($X^2 =$

3039.140; $df = 190$; $p = .000$). This demonstrates strong significance ($p < .001$) and confirms that the data were adequate and suitable for factor analysis.

The 20-item scale and subscales assessing the postpartum PTSD symptoms, according to the DSM-5, exhibited an eigenvalue greater than 1.00, and a two-factor structure that explained 48% of the total variance (Table 4).

The items remained the same as in the original scale, and the factors were named as follows:

1. **'Birth-Related Symptoms' subscale:** This group included a total of 11 items, of which items 3, 4, 5, 6 and 7 corresponded to 'Re-experiencing', while items 8 and 9 corresponded to 'Avoidance', and items 10, 11, 12 and 13 corresponded to 'Negative Cognition and Mood'.
2. **'General Symptoms' subscale:** This group included a total of nine items, of which items 14, 15 and 16 corresponded to 'Negative Cognition and Mood', and items 17, 18, 19, 20, 21 and 22 corresponded to 'Hyperarousal'.

After the EFA was performed, first a two-dimensional and then a four-dimensional CFA were performed.

The fit indices found in the two-factor CFA were as follows: chi-square = 531.273 ($p = .000$), degree of freedom = 166 ($X^2 = 531.273$; $df = 166$, $X^2/df = 3.20$), RMSEA = .080 ($p < .05$) SRMR = .042, CFI = .90, NNFI = .85, GFI = .86 and AGFI = .82. The factor loads for all items were found to be between .21 and .87 in the CFA. The diagram for the CFA is shown in Figure 1. As in the scale developed by Ayers et al. (2018), items 1, 2, 26, 27, 28 and 29 were not subjected to EFA or CFA.

The fit indices found in the four-factor CFA were as follows: chi-square = 533.638 ($p = .000$), degree of freedom =

Table 4. Factor construct for the scale, eigenvalues and explained variance.

Postpartum PTSD according to DSM-5 Subscales	Item No	Scale items	Symptoms related to Birth Subscale	Symptoms Starting/Worsening after the Birth Subscale	
Re-experiencing the Birth	3.	Unwanted and uncontrollable recurrent memories related to the birth (or to parts of the birth).	.611		
	4.	Seeing bad dreams or nightmares related to or about the birth.	.625		
	5.	Repeated visions of memories related to the birth and/or feeling as if re-experiencing the birth.	.432		
	6.	Feeling uncomfortable when remembering the birth.	.746		
	7.	Feeling stressed or anxious when remembering the birth.	.756		
	Avoidance	8.	Trying to avoid thinking about the birth.	.803	
		9.	Avoiding things (people, places, TV shows) that bring back thoughts of the birth.	.527	
Negative Cognition and Mood	10.	Not being able to remember the details of the birth.	.418		
	11.	Blaming oneself or others for what happened during the birth.	.680		
	12.	Having strongly negative feelings (fear, anger, shame) about the birth.	.768		
	13.	Thinking badly of oneself or thinking something bad will happen.	.594		
	14.	Thinking badly of oneself or thinking something bad will happen.		.747	
	15.	Losing interest in activities important to oneself.		.728	
	16.	Feeling disconnected from other people		.505	
Hyperarousal	17.	Not being able to feel positive emotions (happiness, excitement, etc.)		.627	
	18.	Feeling nervous or aggressive.		.413	
	19.	Acting out of control or feeling the desire to harm oneself.		.697	
	20.	Feeling stressed and anxious.		.702	
	21.	To easily feel on edge or jumpy.		.714	
	22.	Having difficulty in focussing or concentrating on a specific subject.		.698	
		Percentage of Variance Explained by the Factors		Eigenvalue	
Symptoms Related to Birth Subscale		25.205		5.041	
Symptoms Starting or Worsening after the Birth Subscale		22.736		4.547	
Total variance explained		% 47.941			

210 ($X^2 = 533.638$; $df = 210$, $X^2/df = 3.33$), $RMSEA = .079$ ($p < .05$) $SRMR = .062$, $CFI = .90$, $NNFI = .87$, $GFI = .88$ and $AGFI = .84$. The factor loads for all items were found to be between .22 and .83 in the CFA. The diagram for the CFA is shown in [Figure 2](#).

It was determined that the mean score for the women according to CityBiTS was 11.12 ± 10.47 , and it was observed that 85.4% had at least one or more symptoms of trauma. Further, 7.9% fulfilled the diagnostic criteria for PTSD according to the DSM-5. Other findings related to the CityBiTS are given in [Table 5](#).

Discussion

The findings of this study and similarly other studies ([Zambaldi et al. 2011](#); [Schepper et al. 2016](#); [Imširagić et al. 2017](#)) have indicated that living in big family and low-income level cause women to be vulnerable to trauma. Although the concept of a big family is a familiar part of Turkish culture, living in big families may be due to a low-income level.

People living at low-income level often prefer to reside with their extended families.

Consistent with the literature ([O'Donovan et al. 2014](#); [Kendall-Tackett 2015](#); [Oliveira et al. 2017](#)), it has been shown that a history of abuse, regardless of whether it is physical, emotional or financial, causes an increase in CityBiTS scores. Women with a history of abuse are a more vulnerable group for traumatic events. Hence, trauma scores have been expected to be high.

Similarly, in accordance with the previous literature, history of taking psychiatric medication in the pre-pregnancy period causes an increase in PTSD scores for the postpartum period. Therefore, women who took psychiatric medication prior to pregnancy need to be closely follow-up in terms of trauma during the perinatal period.

In previous studies, it has been found that women who have undergone medical intervention during labor are more likely to experience PTSD after birth ([Ford et al. 2010](#); [King et al. 2017](#)). In this study, it has been found that urinary catheterisation and intervention during labor in Turkey causes an increase in symptoms of PTSD. Another study previously done in Turkey found the same finding ([Isbir et al. 2016](#)).

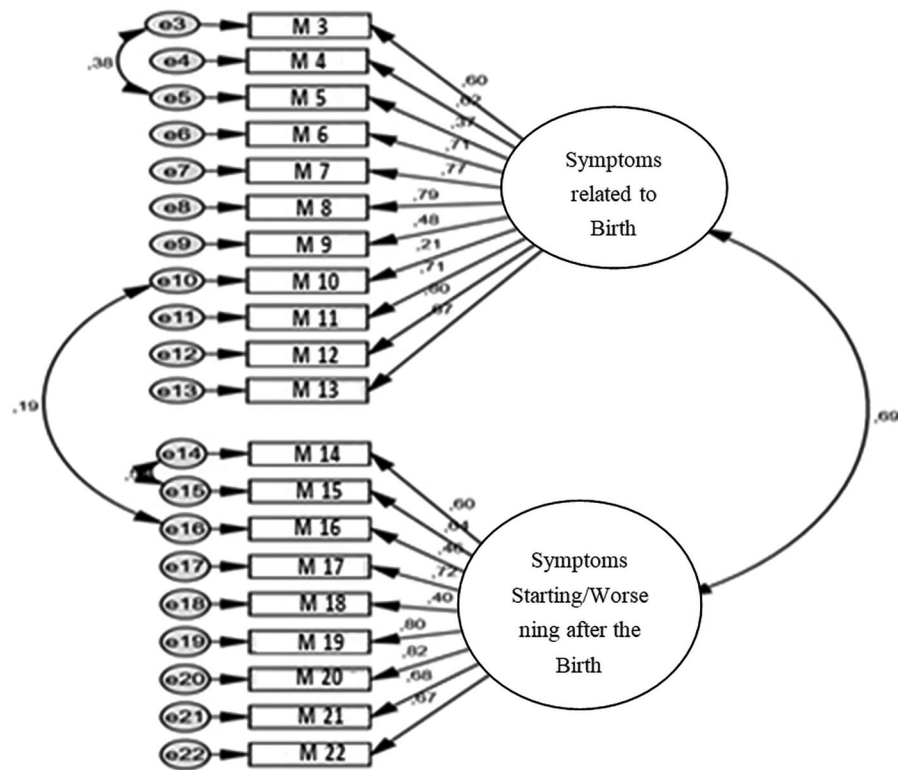


Figure 1. CityBiTS two-factor confirmatory factor analysis diagram.

Although the evidence is not yet clear, it is recommended to use intermittent catheterisation at the first stage of labor and to be strictly discontinued in the second stage (ACOG 2007).

Parallel with the literature's findings, it has been demonstrated that an unexpected emergency Caesarean in which a normal delivery had been planned causes an increase in CityBiTS scores (Vossbeck-Elsebusch et al. 2014; Furuta et al. 2016; İmşiragi et al. 2017). For this reason, it is important to give information about normal delivery and Caesarean to women in the perinatal period. This may help women prepare emotionally and be more comfortable with the idea of undergoing Caesarean labor.

It was also observed in this study that women who developed complications during or immediately after birth had higher PTSD scores in the postpartum period, which is consistent with previous studies (Vossbeck-Elsebusch et al. 2014; Schepper et al. 2016; Lopez et al. 2017; İmşiragi et al. 2017; Capik and Durmaz 2018). Also, as reported by other studies (Zambaldi et al. 2011; Polachek et al. 2014; Furuta et al. 2016), it was found that infant-related complications led to higher PTSD scores in the postpartum period. It is understandable that poor health after birth or having an infant with health problems could cause women more susceptible to negative psychological outcomes. In Turkey, women are not given an opportunity to express their emotions, thoughts and perceptions about birth or to discuss their birth experiences with care providers. It is important to provide women with a safe space to talk about their birth experience and to identify and monitor those who perceive their birth experience as negative/difficult in the first year of post-birth.

This study verifies the validity and reliability of the Turkish version of the CityBiTS. The findings of this study suggest

that the psychometric properties of the Turkish version of the CityBiTS were at appropriate levels. This scale has also been verified the validity and reliability of Hebrew Version (Handelzalts et al. 2018).

The reliability analysis of the CityBiTS was assessed with the test-retest method, as well as internal consistency and item analyses. Test-retest reliability is the ability of an instrument to produce similar results across two administrations of the same test (Erefe 2004; Oner 2006; Erdogan et al. 2014). A statistically significant test-retest correlation of the CityBiTS indicates that the scores over time are stable, which validates the instrument's consistency over a two-week period.

Another finding that supports the reliability of the scale is the level of the scale's internal consistency coefficient. The Cronbach's alpha of Likert-type scales was employed to assess the internal consistency. It is assumed that the higher the alpha coefficient of the scale, the more likely it is that the items in the scale are consistent and inter-correlated with each other. This implies that the scale includes a set of items that evaluate the same construct.

As a function of the average covariance, between the items and the variance of total score, the coefficient alpha is a number between 0 and 1. This number is used to determine whether the items in a scale can be applied to homogeneously to explain a construct (Oner 2006; Erdogan et al. 2014). On the reliability of the Turkish version of the CityBiTS, the analysis for internal consistency demonstrated that the Cronbach's alpha reliability coefficient was at the desired level across all three dimensions.

The experts reviewed the items in terms of content validity and agreed on the fact that the scale demonstrated a good content validity in its original form. The high degree of

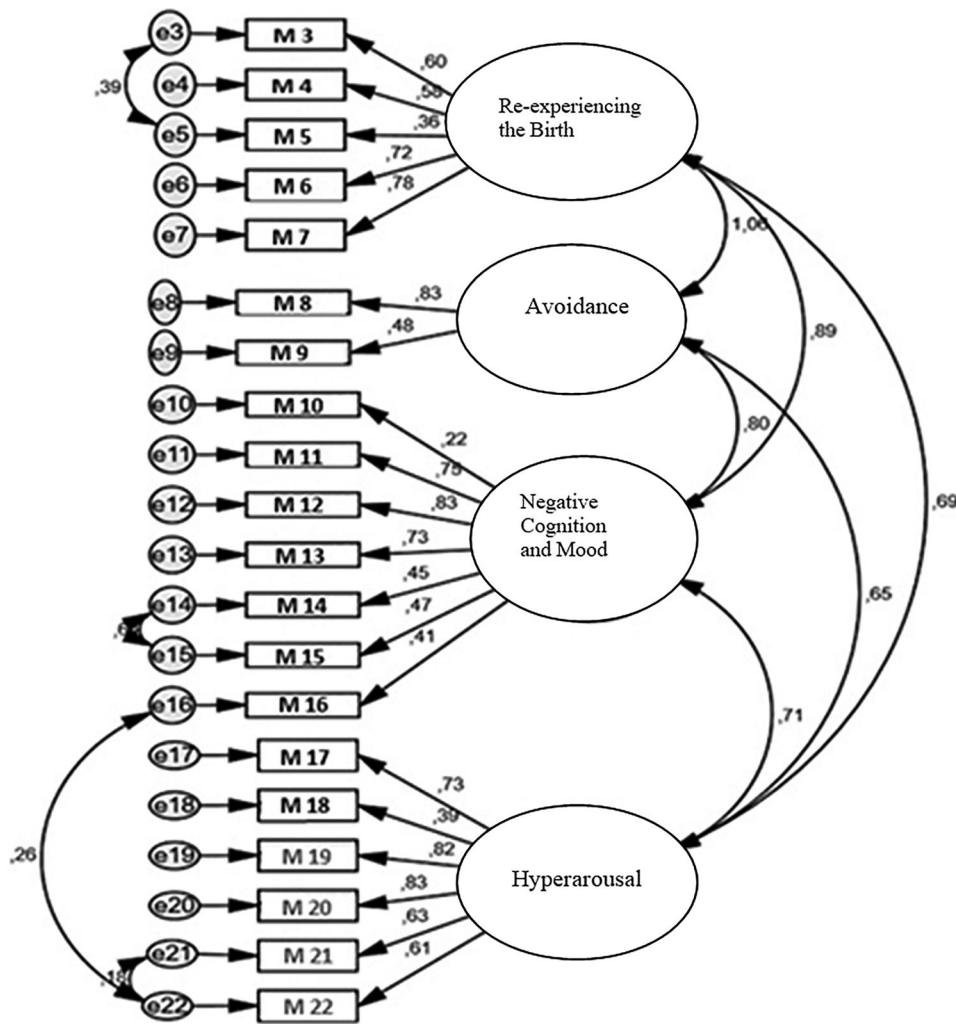


Figure 2. CityBiTS four-factor confirmatory factor analysis diagram.

experts conformity is an important finding for verifying the content validity of the Turkish version of the CityBiTS. To evaluate the factor structure and construct validity of the Turkish version of the CityBiTS, each dimension was subjected to a CFA.

The most commonly employed fit tests are the chi-square, root-mean-square error of approximation (RMSEA), standardised root-mean-square residual (SRMR), comparative fit index (CFI), non-normed fit index (NNFI), goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) (Efe 2004; Oner 2006; Erdogan et al. 2014). The fit statistics resulting from a CFA must be at the desired levels. For a model to be acceptable, the chi-square value is expected to be non-significant. In this study, the chi-square value was found to be non-significant across all dimensions. This suggested a good model fit. RMSEA value equal to or less than 0.08 with a p value of less than .05 (statistical significance) indicates a good model fit, while a value equal to or less than 0.10 is a poor model fit. In this study, RMSEA was found to be significant in each dimension, indicating a good fit. Factor loads should not be less than 0.30. The following values represent a good-fit model: SRMR values of less than 0.10; CFI, GFI, and NNFI values equal to or greater than 0.90; and AGFI values equal to or greater than 0.80 (Efe 2004; Oner 2006; Erdogan et al. 2014). In a statistical analysis, it was found that

the Turkish version of the CityBiTS satisfied all of fit criteria. Mean scores (11.7 ± 11.0) of this study were consistent with the findings of Ayers et al. (2018) for PTSD (7.1%) (Ayers et al. 2018).

In studies with Turkish women, the rate of PTSD was found as 10.6% and 9.2% in Capık and Durmaz (2018) and Yıldız et al. (2017a), respectively. In other countries, it was reported that the rate of PTSD was 0.6%–39% in Christiansen (2017) and 3.1%–15.7% in Grekin and O'Hara (2014). The wide range of rates found may be due to different populations, ages, postpartum period time and the various cultural characteristics that were mentioned in these studies.

Conclusion

In this study, it has been investigated the validity and reliability of the Turkish version of the CityBiTS. It has been shown that the Turkish version of the CityBiTS can be used as a tool to assess the birth trauma and PTSD in postpartum women. The scale may also provide guidance and be effective for early detection of other psychological symptoms related to birth trauma. It can also be used by psychotherapists, psychiatrists and other health care professionals when needed.

Table 5. CityBiTS assessment results according to the Participants' DSM-5 Criteria ($n = 315$).

Criterion	%	N
CityBiTS total mean score: 11.11 ± 10.47		
Not meeting all trauma criteria	92.1	290
Meeting all trauma criteria	7.9	25
Having no symptoms of trauma	16.2	51
Having one or more symptoms of trauma	83.8	264
[A]		
Not meeting stressor criteria	52.4	165
Meeting stressor criteria	47.6	150
[B]		
No symptoms of re-experiencing	27.6	87
Having symptoms of re-experiencing	71.7	226
[C]		
No symptoms of avoidance	56.8	179
Having symptoms of avoidance	43.2	136
[D]		
No negative cognition and mood symptoms	47.3	149
Having negative cognition and mood symptoms	52.7	166
[E]		
Not experiencing hyperarousal	54.6	172
Experiencing hyperarousal	45.4	143
[F]		
Symptoms of less than 1 month	27	85
Symptoms continuing for at least 1 month	72.7	229
[G]		
No distress or impairment	54.9	173
Showing distress or impairment	45.1	142
[H]		
Not meeting exclusion criteria	87.3	275
Meeting exclusion criteria	12.7	40
Not having symptoms of dissociation	69.8	220
Having symptoms of dissociation	30.2	95

The bold data show CityBiTS assessment results according to the Participants' DSM-5 Criteria.

Research limitations

The data based on self-reporting is an important limitation in this research. It is not possible to make a clinical diagnosis of PTSD through a use of self-report questionnaire. Although the scale forms were filled in patient interview rooms to ensure the privacy of women and express themselves, participants may have difficulties in answering the questions. This study was conducted at family health centres and so did not include women from outside these facilities. Since this study was conducted only with women who applied to the family health centres in Istanbul, the results might not be generalised to all women in the postpartum period.

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Disclosure statement

The authors declare that there is no conflict of interest involved in the conduct of the study.

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