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Readiness for Weaning Scale: Development and psychometric measurement study

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Abstract

This study was carried out to develop a measurement tool to determine the readiness of mothers and babies for weaning. At the first stage of the study, a draft of the Readiness for Weaning Scale (RWS) was created. In the second stage, this draft was presented to the opinions of experts (CVI:0.85), and in the third stage, the validity and reliability of RWS were tested by collecting data from the participants ($n = 265$). Factor analysis was performed to determine the construct validity of RWS. As a result of the exploratory factor analysis, the KMO statistic was found to be 0.802. In the factor analysis, four factors were determined, and these factors explained 60.023% of the total variance as a result of the analysis performed with the varimax vertical rotation technique (Weaning intention, Baby's readiness, Weaning technique, Mother's readiness). The internal consistency coefficient of the scale was found to indicate a quite high level of reliability (Cronbach's alpha = 0.793).

KEYWORDS

baby, mother, readiness, weaning

1 | INTRODUCTION

Breastmilk is an important source of energy and nutrients for children aged 0–23 months. Moreover, it reduces the mortality rate in malnourished children by protecting them from diseases (WHO, 2021). While breastfeeding meets the physiological needs of the baby, it also supports the psychosocial development of the baby (Bilgen et al., 2018; Gürarlan Baş et al., 2018; Kartal & Acar, 2022). For this reason, UNICEF (2021) and the World Health Organization (WHO) (2021) suggest that babies start breastfeeding within 1 hour of birth, feed with only breastmilk in the first 6 months of life, and continue breastfeeding and complementary foods until the age of 2 or longer after the 6th month.

The breastfeeding period is a special process in which the bond of love between most mothers and their babies is established, developed, and strengthened. Therefore, weaning the baby off breastmilk is very difficult for some mothers and their babies (Gök et al., 2018). The sudden end of this process, which is a pleasure for the baby, during the period of breastfeeding may lead to problems in the child's emotional, social, and cognitive development in the future (Yiğit, 2020).

WHO (2009) describe weaning as the incremental termination of breastfeeding and transition to complementary feeding that includes solid and liquid foods other than breastmilk. An appropriate course of weaning is important for the healthy growth of babies. Natural weaning should proceed as a spontaneous process between the ages of 2–4, when the baby consumes sufficient variety and amount of complementary foods. It is recommended to stop breastfeeding by first removing daytime feedings and then night feedings. The natural weaning of babies has more positive effects on mother-baby bonding. The risk of trauma decreases when both the mother and the baby are ready to stop breastfeeding (Gök et al., 2018; Kartal & Acar, 2022; Oflu, 2020). It is observed that some mothers have problems in stopping breastfeeding, and particularly mothers who breastfeed their babies until the age of 2 have more difficulties and resort to traditional methods that are not suitable for child health (Gürarşlan Baş et al., 2018). Among these methods, there are practices such as applying something to the breast, covering the nipples or bandaging the breasts, sending the baby to another place, and suddenly stopping breastfeeding (Dinç et al., 2015; Oflu, 2020; Ovalı, 2018; Yüzer Alsaç & Polat, 2018). Trying to stop breastfeeding with ineffective methods at a time when the baby/child is not mentally, emotionally, and physically, ready may cause the child to feel punished, harm their psychosocial development, and undermine the bond of trust. Various problems such as trauma and anxiety disorders, feelings of guilt and inadequacy, pain in the breast, and mastitis may occur in the mother (Al-Sagarat & Al-Kharabsheh, 2017; Kearns et al., 2016; Knowles et al., 2019; Reynolds & Askew, 2019).

To stop breastfeeding, some mothers may need the information and support provided by health professionals. As far as we know, there is no guide for health professionals to determine the readiness levels of mothers and babies for weaning. The appropriate and timely termination of breastfeeding and using the right practices can contribute to improving the general health, nutritional status, and psychological health of children. One might argue that asking mothers and observing mother-baby interaction is the best way to record readiness for weaning. However, deciding to wean the baby off breastmilk with a measurement tool rather than directly asking questions to mothers could be more beneficial for maternal and infant health (Gürarşlan Baş et al., 2018; Yıldız & Gölbaşı, 2019). The aim of this study is to develop a measurement tool to determine the readiness of mothers and babies for weaning.

2 | METHODS

2.1 | Development of the scale

2.1.1 | Development of an item pool

A review of the literature on the subject and studies conducted in Turkey were effective in the development of the scale. Key terms such as “weaning”, “stopping”, “duration”, “cessation”, “...of breastfeeding” were used in the Cochrane Library, PubMed, Scopus, and Google Scholar databases to identify publications on the cessation of breastfeeding. At the same time, thesis studies published on this subject, as well as national and international scales, were analysed, and potential dimensions were evaluated (Dinç et al., 2015; Ekşioglu et al., 2016; Ekşioglu & Ceber, 2011; Özkan, 2015; Uğur et al., 2018; Uyanik et al., 2022). The opinions of health professionals providing breastfeeding counselling were obtained. While creating the conceptual framework of the scale, it was observed that the most focused sub-areas on the subject of weaning were the factors affecting the cessation of breastfeeding, its importance for mothers and infants, social factors, and methods of cessation of breastfeeding (Gök et al., 2018; Gürarşlan Baş et al., 2018; Oflu, 2020; Yüzer Alsaç & Polat, 2018). In the literature review, few studies were found on the factors affecting the readiness of mothers for weaning, their views, and attitudes, but no measurement tool was found on this topic. Weaning is an important period

for both the mother and her baby. For this purpose, the 'Readiness for Weaning Scale' was developed in this study. Considering these subheadings, a literature review was conducted separately, and a pool consisting of a total of 33 items was formed. While writing the items, it was aimed to ensure that each item measured only one behaviour, there would not be more than one emotion, thought, or concept in the same item, and each item was written in a clear and comprehensible language that the group it would be applied could understand.

2.2 | Content validity

Content validity determines the extent to which each item in the scale serves the overall purpose of the measuring tool. The recommended practice for content validity is to get expert opinions. The first version of the scale (instructions, items, response options) was presented to 10 experts for their review in terms of relevance, comprehensiveness, comprehensibility, and ease of usage. The ten experts who agreed to participate in this review process were e-mailed the scale form with clear instructions regarding the definition of each domain, scoring and evaluation criteria. The experts whose opinions were taken about the scale consisted of one Professor and one Associate Professor who are specialised in the field of paediatric health and diseases nursing, one Professor, two Associate Professors, for Assistant Professors and one PhD Midwife who are specialist in the field of midwifery. The experts were asked to what extent each statement in the scale represented readiness to wean, and written feedback was received to indicate a word that was difficult to understand and any missing detail. The Content Validity Index (CVI) was calculated by using the Lawshe technique in the evaluation of the specialist opinions. The experts were asked to rate the items as "the item is appropriate", "the item is appropriate but needs correction", and "the item should be removed". Furthermore, they were asked to read each item with a critical eye in terms of its suitability for the general purpose of the scale, and written comments were received to indicate whether the items were appropriate or not, or whether there were points that needed correction. As a result of the evaluations from the experts, CVI of the scale was calculated. CVI value was determined as 0.85. The Content Validity Ratio (CVR) value of the 5th and 18th items was found to be 0.62. Therefore, these 2 items ("My baby wants to suck all the time, even when he is not hungry" and "I can't stop breastfeeding when my baby is sick, travelling or when he/she is having difficulties because he/she is comfortable at the breast") below the critical value were excluded from the draft scale under development (Lawshe, 1975). The reorganised 30-item form was administered to ten mothers with similar characteristics to the sample by conducting a pilot study (Age = 31.45 ± 4.05 , Educational status = Elementary-Middle School: 15%, High School: 25%, College or above: 60%, Working rate = 40%, Income Status = Low:25%, Medium:60%, High: 15%). As a result of determining that there was no problem in understanding the scale form, it was decided to apply it. The average response time for the scale was 15 minutes.

2.3 | Design and location of the study

The research was planned as a methodological type and scale validity and reliability study. This study was carried out in Turkey between March and December 2021 using an online questionnaire distributed via WhatsApp, Twitter, Facebook, and Instagram.

2.4 | Participants and procedure

The participants consisted of 265 women aged 19–49, still breastfeeding, who wanted to stop breastfeeding, with babies aged 18–36 months. Mothers who had breastfeeding problems, did not want to participate, had a known psychiatric problem, or had health problems in themselves or in the baby were excluded from the study. Although it is recommended to wean the baby at the age of 2 years or later, the rates of continuing breastfeeding are not at the

desired level in Turkey. According to the data from the Turkey Demographic and Health Survey, only 34% of babies are breastfed until the age of 2, and the mean duration of breastfeeding is 16.7 months (Hacettepe University Institute of Population Studies, 2018). In the study of Oflu (2020), the median duration of breastfeeding was reported as 15 months. Since it is a common practice to stop breastfeeding in the early period, it was considered important in this study to obtain information from mothers with babies at or over the age of 18 months.

The statistical power of model fit indices in CFA is affected by sample size, and the accuracy of latent variables (covariance and standard errors) may be affected in small samples ($N < 100-150$) (Brown, 2015). Experts offer different recommendations on factor analysis. Tabachnick and Nickel suggested reaching at least 300 cases. Comrey suggested $N > 200$ for a tool with up to 40 items, Orçan and Yang suggested a sample size greater than 200, and Tavşancıl suggested the inclusion of 5–10 times as many people per item (Tabachnick & Fidell, 2013; Orçan & Yang, 2016; Hoe, 2008; Tavşancıl, 2019). Other researchers have rated factor analysis sample sizes of 50 as very poor, 100 as poor, 200 as moderate, 300 as good, 500 as very good, and 1000 as excellent (Costello & Osborne, 2005; DeVellis, 2017). However, a sample size can be determined by taking into account power, effect size, and alpha error in a power analysis (Brown, 2015; Kline, 2016; Byrne, 2012; Wang & Wang, 2012). In this context, it was determined that a minimum of 134 people should be reached by taking a medium effect size and 5% margin of error with an a priori power analysis (G*Power 3.1.9.7. Franz Faul, Kiel University, Germany). Considering the recommendation for reliability analyses that at least ten times as many individuals be reached for each item, a total of 265 women were included in the study.

Due to the safety measures of the Turkish Ministry of Health regarding the COVID-19 pandemic, it was not possible to obtain permission to collect data at health institutions. For this reason, the study was carried out with the online survey method. Using the convenience sampling method, mothers were reached through social media and messaging platforms, and they were asked to fill in the data collection tool prepared via Google Forms. The questionnaire form was shared in social media groups about mothers and babies. The link to the questionnaire form directed the mothers to the page of the study.

2.5 | Measuring tools

The Mother Information Form: This form was developed by researchers using the information in the literature (Gök et al., 2018; Oflu, 2020). It consisted of 18 questions prepared to determine the sociodemographic, obstetric and baby-oriented characteristics of the mothers.

Readiness for Weaning Scale: The scale was developed by the researchers to determine the attitudes of mothers towards weaning, their experiences, the techniques they use in weaning, the psychosocial effects of these techniques and how they evaluated these techniques in terms of the baby. Based on the literature review, an item pool consisting of 33 statements was created, considering the intention to stop breastfeeding, the readiness of the mother and the baby, and the technique of weaning (Al-Sagarat & Al-Kharabsheh, 2017; Gök et al., 2018; Gürarlan Baş et al., 2018; Oflu, 2020; Yüzer Alsaç & Polat, 2018). However, after receiving expert opinions and conducting a factor analysis, some of the items in the scale were removed, and the final version of the RWS consisted of 19 items. The items were structured to be rated on a 5-point Likert-type scale (5 = Strongly Agree...1 = Strongly Disagree). In the scale, 5 of the items (Items: 2, 5, 13, 15, 16.) were designed as inversely scored items. Accordingly, the maximum and minimum total scores of the scale were 95 and 19, where higher scores indicated higher levels of readiness for weaning.

2.6 | Data collection

The final version of the scale, which was edited after specialist opinions, was designed as an online survey to be administered to the women via the Google Forms platform. The information form was delivered to mothers via social media and messaging platforms by midwives working in health centers or providing breastfeeding counselling.

The scale link was sent to the participants who agreed to participate. The mothers read the information form and consented to participating in the study by choosing to continue with the survey.

2.7 | Data analysis

Descriptive statistical methods such as frequency, percentage, mean and standard deviation were used in the analysis of the sociodemographic, obstetric and postpartum characteristics of the mothers.

In the content validity testing process of the scale, CVR for each item and CVI for the whole scale were calculated. While calculating CVR, the number of experts who rated each item to be “appropriate” was divided by the total number of specialist.

Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA) were used for testing the construct validity of the scale. Kaiser–Meyer–Olkin (KMO) test and Bartlett's test of sphericity were used to evaluate the suitability of the sample and the data for factor analysis. Eigenvalues higher than 1 and a scree plot were used to verify the number of factors. A minimum value of 0.3 was accepted as the lower limit for the factor loads of each item.

In the literature, opinions differ on the use of different data sets for EFA and CFA. Some researchers suggest starting analyses with EFA to determine the measured construct and then conducting a CFA of the determined construct using a new sample (Cabrera-Nguyen, 2010). In addition to this, Henson and ve Roberts (2006) stated that conducting EFA and CFA in the same sample will not provide much information and may be misleading, while Erkuş (2016) and Şahin and Öztürk (2018) argued that it is highly ill-advised to artificially divide the sample into two and conduct EFA on half and CFA on the other half. In this study, it was preferred to use the same dataset to show that a data set fit more than one model.

The reliability of the scale was examined with Cronbach's alpha internal consistency coefficient and item analyses. Hotelling's T2 test and Tukey's additivity test were applied to evaluate the additivity and response bias of the scale items (Kennedy, 2022).

2.8 | Ethical considerations

Written permission was obtained from XX University Faculty of Medicine Clinical Research Ethics Committee (2021/32) in Turkey to conduct the study. In order to protect the rights of the mothers within the scope of the study, before starting to collect data, a written statement was presented to the mothers about the purpose and duration of the study, and the principles of confidentiality and protection of the mothers' information were explained. Mothers were asked whether they agreed to voluntarily participate in the study. The mothers filled out the online form after giving their consent. All participants were given the option to get more detailed information about the study by contacting the researchers.

3 | RESULTS

The sociodemographic, obstetrics and postpartum characteristics of the participants are shown in Table 1.

3.1 | Results of the validity tests of the Readiness for Weaning Scale

Before performing an EFA, KMO test was applied to test whether the sample size was convenient for factor analysis (KMO: 0.802). It was determined that the sample adequacy was “acceptable” for factor analysis. KMO values between 0.5 and 1.0 are considered acceptable. Additionally, according to the result of the Bartlett test of sphericity, the chi-squared value was acceptable ($\chi^2(171) = 1962.919; p < 0.01$) (Table 2).

EFA was performed to reveal the factor structure of the instrument. Principal component analysis was chosen as the factorization method, and the Varimax rotation method was utilised. In the EFA, the acceptability of the factor load values was determined based on a lower limit of 0.40. As a result of the EFA, 12 items in the scale were removed, the factor analysis was performed again, and the remaining items were gathered under four dimensions (Table 3). These dimensions were the “weaning intention, infant readiness, weaning technique, and maternal readiness” dimensions.

In the results of the Varimax rotation, it was seen that the four-factor structure was appropriate according to the items. These factors explained 60.023% of the total variance (Table 3). In multifactorial designs, it is considered sufficient for the factors to explain 40% to 60% of the total variance. In this framework, it was seen that the contribution of a defined factor to the total variance was sufficient in this study.

TABLE 1 Sociodemographic and obstetric characteristics the participants.

Characteristic	n (n = 265)	%
Age (Mean ± SD)	31.93 ± 4.99	
Educational status		
Elementary-Middle School	49	18.5
High School	58	21.9
College or above	158	59.6
Working status		
Yes	105	39.6
No	160	60.4
Income status		
Low	60	22.6
Medium	142	53.6
High	63	23.8
Number of children		
1	117	44.2
2	104	39.2
3	35	13.2
4	9	3.4
Last type of birth		
Vaginal	97	36.6
Caesarean section	168	63.4
Baby's gender		
Male	134	50.6
Female	131	49.4
Age of the baby (Mean ± SD)	23.39 ± 5.4 (Min. 18, Max. 36)	
Initiation of complementary foods (breastfeeding + complementary food)		
Before 6th month	37	14.0
In the 6th month	144	54.3
After 6th month	84	31.7
Attempting to stop breastfeeding		
Yes	119	44.9
No	146	55.1

As CFA model fit indicators, an χ^2/DF ratio lower than five and an RMSEA value lower than 0.08 are considered good fit indicators (Aksu et al., 2017; Uyumaz & Sirganci, 2020). Structural equation modelling results of the scale according to CFA were found to be significant at the $p < 0.001$ level and the scale consisted of 19 items. The obtained goodness-of-fit index values showed that the model and the data obtained from the sample did not have a good fit. The model was improved. During the improvement phase, a covariance was created between the errors with high MI values (Table 4).

The first-level multifactor CFA results of the scale are shown in Figure 1. Accordingly, the lowest factor load value of the 19-item scale was 0.42, and the highest value was 0.88.

3.2 | Results of the reliability tests of the Readiness for Weaning Scale

In reliability analyses, if Cronbach's alpha (α) internal consistency coefficient varying between 0 and 1 is in the range of 0.00–0.40, the scale is considered to be unreliable, a scale with low reliability has a coefficient between 0.41 and 0.60, a reliable scale has a coefficient between 0.61 and 0.80, and a highly reliable scale has a coefficient between 0.81 and 1.00 (Tavşancıl, 2019). It was determined that the RWS and its dimensions had a high degree of reliability (Table 5).

The corrected item-total correlation values in the reliability analyses of the scale were found to be above 0.20 and on a sufficient level (Table 6).

3.2.1 | Hotelling's T^2 test and Tukey's additivity test

Hotelling's T^2 analysis was performed to determine the response bias of the items in the scale. It was found that the item means were different and there was no response bias (Hotelling's $T^2 = 936.109$, $p = 0.000$). In addition, Tukey's additivity test was applied to determine whether the test was additive or not. The scale was found to be additive (Nonadditivity: 0.000).

3.3 | The final version of the Readiness for Weaning Scale

After all the analyses, the 19 items in the final version of the scale were collected under four dimensions. Weaning intention included 6 items, infant readiness included 5 items, weaning technique included 5 items, and maternal readiness included 3 items.

4 | DISCUSSION

No scale has been found in the literature regarding the readiness of mothers to stop breastfeeding their babies. To the best of the authors' knowledge, this scale is the first instrument with validity and reliability to assess mothers'

TABLE 2 Kaiser–Meyer–Olkin and Barlett's test results.

KMO value	0.802
Bartlett sphericity	$\chi^2 = 1962.919$
	df = 171
	$p < 0.0001$

TABLE 3 Explanatory factor analysis results for the dimensions of the Readiness for Weaning Scale.

Dimensions and scale items		Rotated factor loads	Explained variance	Eigen value
F1: Weaning intention			23.104	4.390
Item 1	My baby/toddler is at the right age to stop breastfeeding.	0.770		
Item 19	Since I think that we have a satisfactory breastfeeding process with my baby/toddler, I can easily stop breastfeeding.	0.751		
Item 10	I think breastfeeding is no longer necessary for my baby/toddler.	0.726		
Item 18	I think I have breastfed my baby/toddler long enough.	0.687		
Item 6	My baby/toddler can understand and accept that we stop breastfeeding.	0.655		
Item 17	Even if my baby/toddler cries a lot, I can be determined to stop breastfeeding.	0.579		
F2: Infant readiness			18.075	3.434
Item 2	My baby/toddler wakes up very often at night to suck.	0.827		
Item 14	My baby/toddler wakes up very often at night to suck, so I feel very tired.	0.807		
Item 4	My baby/toddler prefers to suck rather than eat.	0.737		
Item 5	My baby/toddler is sucking, I'm worried if I stop breastfeeding, they will not be able to fall asleep.	0.688		
Item 3	My baby/toddler breastfeeds not because they are hungry, but because they enjoy it.	0.624		
F3: Weaning technique			12.202	2.318
Item 12	I think that practices such as applying something to the breast, sticking it, etc. while stopping breastfeeding may cause psychological trauma to my baby/toddler.	0.750		
Item 11	It is not the right way to stop breastfeeding by keeping my baby/toddler away from myself (by staying apart for a few days) because my baby/toddler may feel abandoned.	0.748		
Item 9	I think stopping breastfeeding abruptly will traumatise my baby/toddler.	0.731		
Item 8	The period when the baby/toddler is teething, sick, etc. is not the right time to stop breastfeeding.	0.719		
Item 7	I can spend enough time with my baby/toddler other than breastfeeding (e.g., playing games, painting, participating in activities).	0.565		
F4: Maternal readiness			6.642	1.262
Item 13	The idea of stopping breastfeeding makes me feel guilty because breastfeeding is the greatest bond between me and my baby/toddler.	0.803		
Item 16	I think my baby/toddler will move away from me if I stop breastfeeding.	0.785		
		0.761		

TABLE 3 (Continued)

Dimensions and scale items		Rotated factor loads	Explained variance	Eigen value
Item 15	Breastfeeding is a very strong bond between me and my baby/toddler, so I do not want to stop breastfeeding.			
TOTAL EXPLAINED VARIANCE = 60.023				

TABLE 4 Findings on Confirmatory Factor Analysis.

Indexes	Good fit	Acceptable fit	Model fit	Result
χ^2/df	0–3	3–5	2.664	Good fit
RMSEA	$0.0 \leq RMSEA \leq 0.05$	$0.06 \leq RMSEA \leq 1.0$	0.079	Acceptable fit
CFI	$0.95 \leq CFI$	$0.85 \leq CFI$	0.873	Acceptable fit
NFI	$0.95 \leq NFI$	$0.80 \leq NFI$	0.814	Acceptable fit
NNFI (TLI)	$0.90 \leq TLI$	$0.80 \leq TLI$	0.846	Acceptable fit
GFI	$0.90 \leq GFI$	$0.80 \leq GFI$	0.871	Acceptable fit
AGFI	$0.90 \leq AGFI$	$0.80 \leq AGFI$	0.826	Acceptable fit

Note: χ^2 : chi-square.

Abbreviations: AGFI, Adjusted Goodness of Fit Index; CFI, Comparative Fit Index; GFI, Goodness of Fit Index; NFI, Normed Fit Index; RMSEA, Root Mean Square Error of Approximation.

readiness to stop breastfeeding. According to the results of this study, the RWS was found to be valid and reliable in mothers with babies aged 18–36 months. The final version of the scale consisted of 19 items, and higher scores obtained from the scale indicated higher levels of readiness to stop breastfeeding. This study was carried out with mothers who had babies that were 18–36 months old and wanted to stop breastfeeding, and a measurement tool was developed.

As a result of the factor analysis performed in the RWS, a 19-item 4-factor construct was formed. By examining the components that made up the structure of the factors that were obtained, the factors were given the names of “intention to wean”, “infant readiness”, “weaning technique”, and “maternal readiness”. While naming the factors, the concept expressed by the items collected in each dimension was taken into consideration. In this process, the relevant literature was reviewed. Similar to this study, the literature focuses on the mother’s intention, time to stop breastfeeding, weaning method, the readiness of the baby and the mother, and environmental and social factors (Akpor et al., 2020; Ezenduka et al., 2018; Kearns et al., 2016; Lindau et al., 2015; Naher et al., 2019). The weaning process is a period that should be evaluated specifically for the mother and the baby. The scale that was developed in this study consisted of items related to the mother’s intention and readiness to stop breastfeeding. The mother’s positive response to these items indicates that the mother intends to stop breastfeeding. It is very important that the baby is ready to stop breastfeeding so that the weaning process does not have a traumatic effect or adversely affects the psychosocial development of the child. In the infant readiness dimension, there were items to determine the baby’s readiness to stop breastfeeding. In addition to the unpreparedness of the baby, weaning techniques can also have traumatic effects on the child (Reynolds & Askew, 2019; Gök et al., 2018; Gürarşlan et al., 2018; Yüzer Alsaç & Polat, 2018; Al-Sagarat & Al-Kharabsheh, 2017; Knowles et al., 2019). In the weaning technique dimension, there were statements questioning the mother’s level of knowledge in terms of the correct timing and the correct technique. Mothers may be concerned about the right time to stop breastfeeding. Another point in this dimension was the method of weaning. It is known that mothers try many traditional methods such as inducing disgust in the

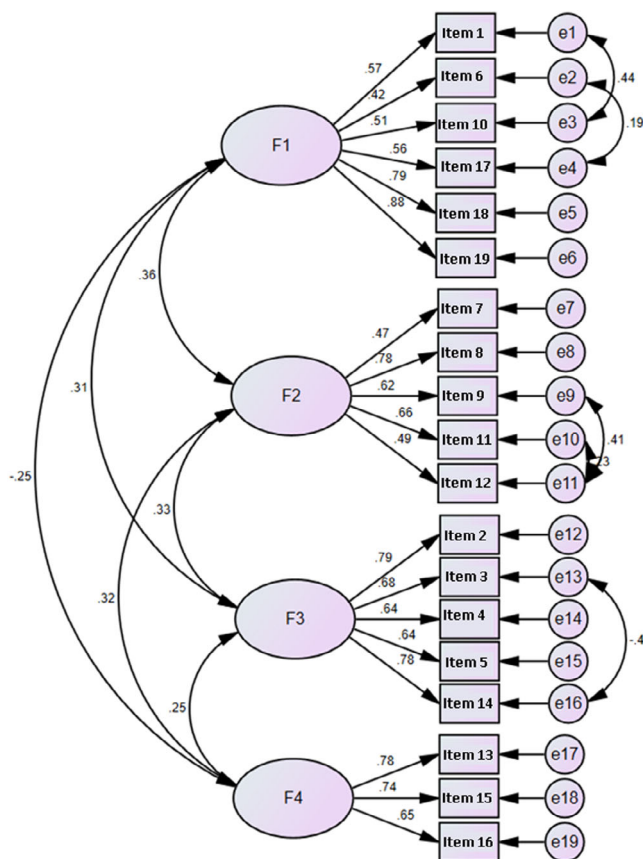


FIGURE 1 Model of first-level multifactor confirmatory factor analysis of the readiness for weaning scale (Factor 1: Weaning intention, Factor 2: Infant readiness, Factor 3: Weaning technique, Factor 4: Maternal readiness).

TABLE 5 Score distribution and internal consistency of the scale and its sub-dimensions.

	Number of items	Min-max	Mean ±SD	Cronbach alpha
Readiness for Weaning Scale	19	19.00–88.00	64.01 ± 11.31	0.793
<i>Weaning intention</i>	6	6.00–30.00	19.86 ± 5.51	0.813
<i>Infant readiness</i>	5	5.00–25.00	16.31 ± 5.16	0.774
<i>Weaning technique</i>	5	5.00–25.00	19.72 ± 4.50	0.822
<i>Maternal readiness</i>	3	3.00–15.00	8.12 ± 3.24	0.763

baby to stop the baby from sucking, leaving the mother and the baby apart, and giving the breast a bad taste by applying something to the breast. Recent studies evaluating Turkish mothers' weaning practices pointed out that many traditional practices are used, and these practices can have traumatic consequences for both the mother and the baby (Dilek Aksoy et al., 2020; Oflu, 2020; Yıldız & Gölbaşı, 2019). In the maternal readiness dimension, there were statements that evaluated whether the mother was psychologically ready to stop breastfeeding, such as those about guilt, the baby's withdrawal, and the breaking of the strong bond with the baby. Individuals' thoughts and perceptions about weaning may differ significantly depending on the culture they live in.

TABLE 6 Effects of the items constituting the scale on the reliability.

Items	Scale average when item was deleted	Scale variance when item is deleted	Item-total score correlation	Cronbach's alpha value when item is deleted
F1				
Item1	16.59	21.008	0.614	0.774
Item 6	16.97	23.677	0.452	0.808
Item 10	17.01	21.261	0.566	0.786
Item 17	16.62	22.510	0.507	0.798
Item 18	15.97	22.158	0.619	0.775
Item 19	16.15	20.795	0.701	0.755
F2				
Item 2	12.97	16.828	0.703	0.759
Item 3	12.75	19.012	0.542	0.807
Item 4	13.49	17.887	0.606	0.789
Item 5	13.22	17.783	0.592	0.793
Item 14	12.81	17.611	0.631	0.782
F3				
Item 7	15.89	15.446	0.378	0.784
Item 8	15.44	13.906	0.600	0.716
Item 9	15.92	12.990	0.604	0.711
Item 11	15.61	13.247	0.579	0.720
Item 12	16.04	12.813	0.579	0.721
F4				
Item 13	5.01	4.614	0.630	0.643
Item 15	5.20	4.742	0.613	0.663
Item 16	6.03	6.257	0.568	0.725

The response bias of the scale was analysed using the Hotelling T^2 analysis method. In the process of testing the response bias of a scale, the homogeneity of the responses given for each item is evaluated. In other words, the researcher determines whether the mean scores of items are significantly different from each other.

Hotelling's T-test also measures whether the items in the scale are perceived in the same way by the participants and the difficulty level of each item. As a result of the test in this study, it was determined the participants answered to the items of the scale according to their own opinions, and there was no response bias in the scale forms ($p = 0.000$) (Kartal & Bardakçı, 2018; Özdamar, 2017; Seçer, 2018).

Tukey's test of additivity was applied to evaluate whether the scale items were suitable for obtaining a total score. According to the results that were obtained, since the significance value was $p < 0.05$, it was determined that the scale was additive. In other words, a single total scale score could be obtained by summing the scores of the scale items (Özdamar, 2017).

Considering the psychometric properties of the RWS that was developed in Turkish and tested in a Turkish sample, all results provided supporting evidence that the structure of the scale was reliable and valid. It can be concluded that it is a valid and reliable measurement tool that can be used by healthcare professionals providing services in the field of maternal and newborn health to evaluate the process of weaning.

4.1 | Limitations and future research

To the best of our knowledge, this is the first study about developing a scale on readiness to stop breastfeeding, and its validity and reliability are recommended to be tested with further studies. A limitation of this study was that the findings cannot be generalised to countries other than Turkey. It can be tested by applying it in countries where breastfeeding rates are low, and breastfeeding is stopped early, among refugees, adolescents, older mothers, working and disadvantaged groups. In future studies, the psychometric properties of the RWS can be re-evaluated in larger samples and different cultures.

There were several limitations to consider in the interpretation of the results of this study. First, since the research was based on online data collection, it was limited to people who used social networks and agreed to participate in the study, and the results might not be representative of the general population. Second, there may be a memory factor or reporting error as the data were based on a self-report questionnaire.

5 | CONCLUSION

There is no valid and reliable tool in the literature to measure the readiness levels of mothers and babies for weaning. As a result of this study, it was proven that the RWS is a valid and reliable tool. The RWS is a 5-point Likert-type. Items 2, 5, 13, 15, and 16 on the scale are inversely coded. The total score that can be obtained from the scale varies between 19 and 95. Higher scores obtained from the scale are interpreted as higher levels of readiness to stop breastfeeding. The mean RWS score of the mothers who were included in this study was found to be 64.01 (SD = 11.31; Minimum = 19.00; Maximum = 88.00).

It may be stated that this study fills an important knowledge gap about the readiness of mothers for stopping breastfeeding. This scale can benefit research and practice involving interviews with mothers in clinical settings. It constitutes a guide for midwives which is considered an important source of information especially for breastfeeding mothers, in terms of determining the intentions of mothers on this issue. In this context, healthcare professionals can easily use the RWS in routine practice and evaluate the mother and the baby.

AUTHOR CONTRIBUTIONS

Hülya TÜRKMEN: Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing – original draft; writing – review and editing. **AYSUN EKŞİOĞLU:** Data curation; formal analysis; resources; writing – original

draft; writing – review and editing. **NAZAN TUNA ORAN:** Conceptualization; data curation; writing – original draft; writing – review and editing. **AYFER ERDOĞAN:** Data curation; writing – review and editing.

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None.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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