



# Mothers' Perceptions and Attitudes Toward Human Milk Banking Scale: A Scale Development Study

*Annelerin Anne Sütü Bankacılığına İlişkin Algı ve Tutumlar Ölçeği: Bir Ölçek Geliştirme Çalışması*

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## ABSTRACT

**Objective:** The aim of this investigation is to construct and psychometrically evaluate a novel measurement instrument designed to capture maternal perceptions and attitudes regarding donor milk services.

**Method:** An instrument development investigation was undertaken among mothers between 18-49 years of age with their offspring under sixty months who presented to the pediatric department of İzmir Bakırçay University Çiğli Training and Research Hospital. Information about study participants was gathered using a demographic information form and the newly constructed "Perceptions and Attitudes Toward Human Milk Banking".

**Results:** Psychometric evaluation encompassed content validity assessment, dimension reduction through principal axis factoring, structural verification via latent variable modeling, and homogeneity assessment through estimation of coefficient alpha with item-scale correlation analysis. Upon completion of item refinement procedures, the finalized eighteen-item version exhibited superior homogeneity (coefficient alpha=0.925). Sampling adequacy assessment yielded a Kaiser-Meyer-Olkin coefficient of 0.789, while the Bartlett sphericity examination reached the level of statistical significance ( $p<0.001$ ). Dimension reduction revealed a tripartite structure accounting for 70.089% of score variability including Communal Encouragement and Behavioral Inclination ( $\alpha=0.943$ ), Informational and Security Consciousness ( $\alpha=0.874$ ), and Personal Evaluations and Reservations ( $\alpha=0.655$ ). Confirmatory factor analysis demonstrated satisfactory correspondence between the hypothesized model and observed data ( $\chi^2/df=1.818$ ; Comparative Fit Index=0.965; Root Mean Square Error of Approximation=0.064). Time-dependent consistency assessment through repeated applications yielded intraclass correlation coefficients ranging from 0.91-0.93.

**Conclusion:** This scale constitutes a psychometrically sound 18 item-ratng instrument featuring three constituent domains appropriate for capturing mothers' perceptions and attitudes concerning donor milk services.

**Keywords:** Human milk banking, perception, validity, reliability, attitude

## ÖZ

**Amaç:** Bu araştırmanın amacı, annelerin anne sütü bankacılığına ilişkin bakış açılarını ve tutumlarını değerlendirmek üzere tasarlanmış yeni bir ölçek aracını geliştirmek ve psikometrik özelliklerini incelemektir.

**Yöntem:** Bu ölçek geliştirme çalışması, İzmir Bakırçay Üniversitesi Çiğli Eğitim ve Araştırma Hastanesi Pediatri Servisi'ne başvuran, 18-49 yaş aralığında ve beş yaş altı çocuğa sahip anneler arasında yürütülmüştür. Katılımcı bilgileri, sosyodemografik bilgi formu ve yeni geliştirilen "Anne Sütü Bankacılığına Yönelik Algı ve Tutumlar Ölçeği" aracılığıyla toplanmıştır.

**Bulgular:** Psikometrik değerlendirme; kapsam geçerliği analizi, temel eksen faktörleştirme yoluyla boyut indirgeme, doğrulayıcı faktör analizi ile yapısal doğrulama ve Cronbach alfa katsayısı ile madde-toplam korelasyon analizi aracılığıyla iç tutarlılık değerlendirmesini kapsamıştır. Madde analizi süreçlerinin tamamlanmasının ardından, son hali verilen on sekiz maddelik versiyon üstün iç tutarlılık göstermiştir (Cronbach  $\alpha=0.925$ ). Örneklem yeterliliği değerlendirmesi Kaiser-Meyer-Olkin katsayısını 0.789 olarak belirlemiş, Bartlett küresellik testi istatistiksel anlamlılığa ulaşmıştır ( $p<0.001$ ). Açımlayıcı faktör analizi,

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toplam varyansın %70.089'unu açıklayan üç faktörlü bir yapı ortaya koymuştur: Sosyal Destek ve Davranışsal Niyet ( $\alpha=0.943$ ), Bilgi ve Güvenlik Farkındalığı ( $\alpha=0.874$ ) ve Bireysel Algılar ve Çekinceler ( $\alpha=0.655$ ). Doğrulamalı faktör analizi, önerilen model ile gözlenen veriler arasında kabul edilebilir uyum göstermiştir ( $\chi^2/df=1.818$ ; CFI=0.965; RMSEA=0.064). Tekrarlanan uygulamalar yoluyla zamana bağlı tutarlılık değerlendirme, 0.909 ile 0.925 arasında değişen sınıf içi korelasyon katsayıları vermiştir.

**Sonuç:** Bu ölçek annelerin anne sütü bankacılığına ilişkin algı ve tutumlarını değerlendirmek için uygun, üç alt boyuttan oluşan, geçerli ve güvenilir 18 maddelik bir ölçme aracıdır.

**Anahtar Kelimeler:** Anne sütü bankacılığı, algı, geçerlik, güvenilirlik, tutum

## INTRODUCTION

Breast milk constitutes the primary nutritional source for newborns, furnishing unparalleled sustenance for pediatric maturation and advancement. International health authorities advocate for uninterrupted maternal feeding throughout the initial half-year of infants' life, with subsequent maintenance alongside supplementary nourishment extending to the second year of life<sup>(1)</sup>. Maternal milk fortifies immunological defenses of the infants, shields against pathogenic invasions, facilitates neurodevelopmental progression, and attenuates enduring susceptibilities to cardiovascular pathology, excessive adiposity, and metabolic dysregulation<sup>(2,3)</sup>. The advantages of maternal feeding transcend offspring wellness to incorporate benefits for maternal physiological outcomes.

Statistical documentations released by Turkish health registries for the year 2024 indicate that maintaining only breastfeeding during the initial half-year of life reached 40.7%, subsequently diminishing to 3% among infants between six and nine months of age<sup>(4)</sup>. Domestic investigations have documented heterogeneous nursing durations<sup>(5-7)</sup>, suggesting that breastfeeding represents an enduring practice in Türkiye. Nevertheless, irrespective of its prevalence and persistence, universal accessibility to sufficient provision of breast milk remains unattainable for all newborns under all circumstances.

Under circumstances encompassing premature delivery, maternal pathology, postponed initiation of milk production, transient parent-offspring disconnection, or heightened neonatal nutritional demands, provision of supplementary breast milk may prove indispensable even when maternal breastfeeding continues<sup>(1)</sup>. Within such contexts, donor milk services materialize as a consequential practice that augments and supplements rather than directly superseding maternal breastfeeding. Global health organizations underscore the importance of nourishing infants incapable of receiving biological maternal milk with donated breast milk as opposed to commercial formulations<sup>(8)</sup>.

Donor milk facilities undertake acquisition, evaluation, treatment, preservation, and allocation of maternal breast milk donated to neonates requiring supplementation<sup>(9)</sup>. Nonetheless the number of such international establishments continues to expand. Despite governmental inclusion of milk banking within the 2013-2017 strategic framework, no operational donor milk facility presently functions in Türkiye<sup>(1,2)</sup>. Theological and sociocultural apprehensions, notably considerations (ie.fatwas) concerning lactational kinship within Islamic jurisprudence, represent substantial impediments<sup>(2,8)</sup>. However, predominantly Muslim nations including Malaysia and Kuwait have successfully instituted culturally attuned operational frameworks<sup>(1,2,8)</sup>.

For the implementation of donor milk services in Türkiye, thorough evaluation of communal perspectives and dispositions proves indispensable. Despite the necessity of assessing multifaceted constructs encompassing informational awareness, theological-cultural viewpoints, security apprehensions, communal encouragement, and service utilization willingness, no standardized Turkish measurement instrument currently exists. Consequently, this investigation sought to construct the Mothers' Perceptions and Attitudes Toward Human Milk Banking Scale (PAT-HMBS) and evaluate its measurement characteristics to facilitate policy formulation, public enlightenment, and clinical consultation.

## MATERIAL and METHODS

### Study Design

This investigation was undertaken both to construct the "Mothers' Perceptions and Attitudes Toward Human Milk Banking Scale" and to appraise its measurement characteristics.

### Target Population and Participants

The target population encompassed mothers presenting to the pediatric department of İzmir Bakırçay University Çiğli Training and Research Hospital throughout the investigation timeframe. Selection of study participants was performed using accessibility-based

sampling method among mothers satisfying eligibility requirements. Eligibility requirements encompassed: age range of 18-49 years, possession of minimum one offspring under sixty months of age, capacity to comprehend Turkish language, and consensual agreement to participate. Mothers providing incomplete or erroneous responses were not included in the study.

Methodological guidelines for instrument development investigations advocate inclusion of number of participants representing 5-10 multiples of statement counts or enrollment of minimum 300 individuals<sup>(10,11)</sup>. Authorities recommend enrollment of minimum 150 participants for dimension reduction procedures and 200 participants for structural verification analyses<sup>(12,13,14)</sup>. Correspondingly, for the preliminary twenty-four-item instrument, 200 participants were recruited for dimension reduction and 200 participants for structural verification, producing a cumulative sample of 400 mothers.

### **Assessment Instruments**

#### **Demographic Information Form**

This questionnaire was formulated by the research team drawing upon pertinent scholarly literature<sup>(2,5-10)</sup>. The form encompassed 23 inquiries addressing attributes of the participants (age, conjugal condition, scholastic attainment, occupational engagement, vocational classification, subjective economic standing, geographical habitation), reproductive and offspring particulars (number of offspring under five years of age, age of the youngest offspring, parturition modality, gestational duration at the most recent delivery, history of premature birth, and neonatal intensive treatment, nursing status, duration of cumulative nursing, onset of supplementary nourishment), health and behavioral determinants (presence of a chronic pathology, routine use of pharmaceutical consumption, smoking status, body composition index), healthcare accessibility and assistance (routine medical examinations, lactation consultation, perceived communal assistance).

#### **Mothers' Perceptions and Attitudes Toward Human Milk Banking Scale (PAT-HMBS)**

This measurement instrument was formulated by the research team. Throughout construction of this instrument, exhaustive review of scholarly literature was initially undertaken to delineate dimensions encompassing informational awareness, consciousness, security perception, theological and sociocultural dispositions, communal orientations, and willingness to utilize service concerning donor milk banking. Drawing

upon these dimensions, a repository of 24 items was generated. The instrument employs a five-category Likert response format, quantified as "Completely Disagree" (1), "Disagree" (2), "Uncertain" (3), "Agree" (4), and "Completely Agree" (5). No inversely-scored items exist within the instrument. The definitive instrument version comprises 18 items distributed across three constituent domains: Communal Encouragement and Behavioral Inclination (11 items; scoring span: 11-55), Informational and Security Consciousness (4 items; scoring span: 4-20), and Personal Evaluations and Reservations (3 items; scoring span: 3-15). Cumulative instrument scores ranges between 18 to 90 points, with higher scores signifying increasingly favorable perspectives and dispositions toward donor milk services.

### **Instrument Construction Procedures**

#### **Statement Repository Generation**

During the preliminary instrument construction phase, exhaustive examination of domestic and international scholarly literature concerning donor milk banking was undertaken<sup>(2,3,8,9,15-19)</sup>. Investigations addressing informational comprehension, security apprehensions, theological and sociocultural perspectives, communal orientations, and willingness to utilize health care service were scrutinized. Five conceptual dimensions emerged, and statements representing each dimension were composed to establish a repository of 24 items.

#### **Specialist Evaluation and Content Appropriateness**

The repository of statements was submitted to 10 specialists possessing doctoral credentials in Maternal Health and Obstetric Nursing or Pediatric Nursing for the assessment of content appropriateness. The Davis methodology used guided evaluation procedures of specialists<sup>(20)</sup>. Specialists categorized each statement as "(a) suitable," "(b) requires minimal modification," "(c) requires substantial modification," or "(d) unsuitable." The Content Validity Index (CVI) for each statement was computed as the proportion of specialists selecting categories (a) or (b). CVI values  $\geq 0.80$  were deemed satisfactory<sup>(21,22)</sup>. Within this investigation, statement-level CVI values spanned 0.90 to 1.00, with instrument-level CVI reaching 0.94 percent.

#### **Preliminary Testing**

Subsequent to assessments by specialists, preliminary testing was undertaken with 10 mothers satisfying eligibility criteria to assess comprehensibility, implementability,

statement lucidity, and time to complete the test. Direct interpersonal interviews were conducted, with participants requested to appraise the lucidity and ease of response for each statement. Ambiguous or potentially misinterpreted statements underwent revision based upon observations of participants which was completed in approximately 8-10 minutes. To preclude potential familiarization effects, participants who performed preliminary testing were not included in the primary sample.

### Information Gathering Procedure

The investigation was performed at the pediatric department of İzmir Bakırçay University Çiğli Training and Research Hospital spanning October 6, 2025, through January 2, 2026, subsequent to receiving ethical approval from the Amasya University Rectorate–Non-Interventional Clinical Research Ethics Committee (decision no.: 2025000172, date: 02.10.2025), and institutional clearance. Mothers presenting to ambulatory and inpatient units received information about the investigations, and written authorization was obtained from those satisfying eligibility requirements and consenting to participate. Information was gathered through direct interpersonal interviews conducted individually within a confidential consultation space at suitable times following verification of safety and welfare of offspring. Participants received information regarding investigation objectives, voluntary participation, and information confidentiality. Each questionnaire required approximately 10-15 minutes for completion.

### Statistical Analysis

Analytical procedures were performed utilizing IBM SPSS Statistics 22.0 and IBM AMOS 24.0 statistical software programs. Descriptive computations were performed: categorical variables underwent summarization as frequencies and proportions, while continuous variables were expressed as arithmetic means, spread measures, and value ranges. Distribution characteristics were evaluated through asymmetry and peakedness indices.

**Validity Examinations:** Structural validity was evaluated through dimension reduction and structural verification procedures. Antecedent to dimension reduction, information appropriateness for factorization was appraised through the Kaiser-Meyer-Olkin (KMO) sampling adequacy coefficient and Bartlett sphericity examination. KMO values  $\geq 0.60$  and significant Bartlett sphericity examination outcomes ( $p < 0.05$ ) were deemed satisfactory<sup>(23)</sup>. Principal axis extraction with orthogonal rotation was employed for dimension

reduction. Statements exhibiting dimension loadings  $\geq 0.40$  were preserved<sup>(22)</sup>. Structural verification was undertaken on an autonomous sample to corroborate the dimensional configuration. Model correspondence was appraised through application of chi-square test to degrees of freedom ratio ( $\chi^2/df$ ), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Normed Fit Index, Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual.

### Homogeneity Examinations

Homogeneity was assessed through Cronbach coefficient alpha; and values  $\geq 0.70$  were deemed satisfactory<sup>(23)</sup>. Adjusted statement-scale correlations were estimated and correlations  $\geq 0.30$  signified adequate statement discrimination<sup>(22)</sup>. Temporal consistency underwent evaluation through intraclass correlation coefficients (ICC) derived from relevant tests conducted at fourteen-day intervals.

### Discriminative Capacity

To appraise the instrument's capacity for intergroup differentiation, independent sample comparisons were undertaken contrasting the lowest 27% and highest 27% subgroups based upon cumulative scores. The level of statistical significance was set at  $p < 0.05$  for all examinations.

## RESULTS

The preponderance of participants (61.5%) fell within the 31-40 year age bracket, 89.5% of them were married, 32.5% of them were secondary school graduates, and 42% of them were not engaged in an employment external to the household. Approximately 46% of them indicated that their earnings approximated their expenditures. Among participants, 43% of them resided within provincial centers and 50% of them had two offspring. Concerning parturition modality, 52% of them had undergone surgical delivery, with approximately one-third possessing histories of premature birth and neonatal intensive treatment admission. Regarding nursing status, 55% had discontinued nursing while 35% were presently nursing. Mean chronological age of participants was  $33.55 \pm 5.88$  years, mean age of the youngest offspring was  $16.02 \pm 13.99$  months, mean cumulative duration of nursing was  $8.62 \pm 5.76$  months, and mean age for starting supplementary nourishment was  $3.91 \pm 1.99$  months (Table 1).

**Table 1. Distribution of participants according to their descriptive characteristics**

| Variables                                      | n   | %    |
|--|-----|------|
| <b>Age (years)</b>                             |     |      |
| ≤30  | 50  | 25.0 |
| 31-40  | 123 | 61.5 |
| ≤41  | 27  | 13.5 |
| <b>Marital status</b>                          |     |      |
| Married  | 179 | 89.5 |
| Single   | 21  | 10.5 |
| <b>Educational level</b>                       |     |      |
| Primary/secondary school                       | 36  | 18.0 |
| High school                                    | 65  | 32.5 |
| Associate degree                               | 44  | 22.0 |
| Bachelor's degree                              | 44  | 22.0 |
| Graduate degree                                | 11  | 5.5  |
| <b>Employment status</b>                       |     |      |
| Full-time                                      | 70  | 35.0 |
| Part-time                                      | 46  | 23.0 |
| Unemployed/homemaker                           | 84  | 42.0 |
| <b>Perceived income</b>                        |     |      |
| Income lower than expenses                     | 83  | 41.5 |
| Income equal to expenses                       | 92  | 46.0 |
| Income higher than expenses                    | 25  | 12.5 |
| <b>Place of residence</b>                      |     |      |
| Provincial center                              | 86  | 43.0 |
| District                                       | 78  | 39.0 |
| Town/village                                   | 36  | 18.0 |
| <b>Number of children under 5 years of age</b> |     |      |
| 1  | 91  | 45.5 |
| 2  | 100 | 50.0 |
| 3  | 9   | 4.5  |
| <b>Delivery</b>                                |     |      |
| Vaginal  | 96  | 48.0 |
| Cesarean section                               | 104 | 52.0 |
| <b>History of preterm birth</b>                |     |      |
| Yes  | 57  | 28.5 |
| No   | 143 | 71.5 |
| <b>History of NICU admission</b>               |     |      |
| Yes  | 57  | 28.5 |
| No   | 143 | 71.5 |
| <b>Breastfeeding status</b>                    |     |      |
| Currently breastfeeding                        | 70  | 35.0 |
| Expressing milk                                | 17  | 8.5  |

**Table 1. Continued**

| Variables  | n                  | %              |
|--|--------------------|----------------|
| Stopped breastfeeding                                      | 110                | 55.0           |
| Never breastfed  | 3                  | 1.5            |
| <b>Received breastfeeding counseling</b>                   |                    |                |
| Yes  | 179                | 89.5           |
| No   | 21                 | 10.5           |
| <b>Continuous variables</b>                                | <b>Mean +/- SD</b> | <b>Min-max</b> |
| Age (years)  | 33.55+/-5.88       | 22-44          |
| Age of youngest child (months)                             | 16.02+/-14.00      | 2-53           |
| Gestational week at last delivery                          | 37.61+/-2.27       | 32-43          |
| Duration of total breastfeeding (months)                   | 8.62+/-5.76        | 0-26           |
| Age at starting nutrition with complementary food (months) | 3.91+/-1.99        | 0-7            |
| Body mass index (kg/m <sup>2</sup> )                       | 26.14+/-3.87       | 20.3-36.7      |
| NICU: Neonatal Intensive Care Unit                         |                    |                |

### Homogeneity and Statement Analysis

The preliminary twenty-four-item PAT-HMBS version exhibited a Cronbach coefficient alpha of 0.872, signifying satisfactory homogeneity and suggesting that statements generally assessed the identical construct. Scrutiny of adjusted statement-scale correlations disclosed that most statements surpassed the 0.30 satisfactory threshold. Nevertheless, several statements (PAT-HMBS6, PAT-HMBS8, PAT-HMBS10, PAT-HMBS15, PAT-HMBS20) exhibited minimal or inverse statement-scale correlations, signifying inadequate correspondence with the underlying construct. Moreover, elimination of these statements produced elevated Cronbach alpha values, substantiating the adverse influence of these problematic statements on homogeneity. Subsequent to elimination of statements exhibiting minimal or inverse statement-scale correlations, the definitive eighteen-statement version exhibited a Cronbach alpha of 0.925, signifying its superior homogeneity (Table 2).

### Dimension Reduction Analysis

Dimension reduction analysis was undertaken to scrutinize structural validity of the instrument. Antecedent to analysis, appropriateness of the information concerning factorization was assessed. The KMO coefficient of 0.789 signified adequate sampling appropriateness. Bartlett sphericity examination achieved statistical significance ( $\chi^2=3680.893$ ;  $df=153$ ;  $p<0.001$ ), corroborating sufficient inter-variable correlations for factorization.

**Table 2. Item analysis results**

| Items      | Initial item-total correlation (r) | Initial Cronbach's $\alpha$ if item deleted | Final item-total correlation (r) | Final Cronbach's $\alpha$ if item deleted |
|------------|------------------------------------|---|----------------------------------|---|
| PAT-HMBS1  | 0.733                              | 0.860                                       | 0.712                            | 0.919                                     |
| PAT-HMBS2  | 0.375                              | 0.871                                       | 0.370                            | 0.931                                     |
| PAT-HMBS3  | 0.638                              | 0.862                                       | 0.630                            | 0.921                                     |
| PAT-HMBS4  | 0.554                              | 0.864                                       | 0.557                            | 0.923                                     |
| PAT-HMBS5  | 0.401                              | 0.869                                       | 0.416                            | 0.927                                     |
| PAT-HMBS6  | 0.079                              | 0.880                                       | -                                | -   |
| PAT-HMBS7  | 0.361                              | 0.870                                       | 0.373                            | 0.927                                     |
| PAT-HMBS8  | -0.172                             | 0.883                                       | -                                | -   |
| PAT-HMBS9  | 0.530                              | 0.865                                       | 0.525                            | 0.923                                     |
| PAT-HMBS10 | -0.124                             | 0.883                                       | -                                | -   |
| PAT-HMBS11 | 0.177                              | 0.876                                       | -                                | -   |
| PAT-HMBS12 | 0.479                              | 0.866                                       | 0.498                            | 0.924                                     |
| PAT-HMBS13 | 0.548                              | 0.864                                       | 0.534                            | 0.923                                     |
| PAT-HMBS14 | 0.646                              | 0.863                                       | 0.662                            | 0.921                                     |
| PAT-HMBS15 | -0.089                             | 0.885                                       | -                                | -   |
| PAT-HMBS16 | 0.800                              | 0.856                                       | 0.794                            | 0.917                                     |
| PAT-HMBS17 | 0.822                              | 0.858                                       | 0.827                            | 0.917                                     |
| PAT-HMBS18 | 0.779                              | 0.858                                       | 0.772                            | 0.918                                     |
| PAT-HMBS19 | 0.794                              | 0.859                                       | 0.785                            | 0.918                                     |
| PAT-HMBS20 | 0.057                              | 0.878                                       | -                                | -   |
| PAT-HMBS21 | 0.761                              | 0.859                                       | 0.789                            | 0.918                                     |
| PAT-HMBS22 | 0.779                              | 0.859                                       | 0.799                            | 0.918                                     |
| PAT-HMBS23 | 0.704                              | 0.861                                       | 0.739                            | 0.919                                     |
| PAT-HMBS24 | 0.713                              | 0.860                                       | 0.732                            | 0.919                                     |

Initial Cronbach alpha=0.872, Final Cronbach alpha=0.925, r=Item-total correlation

Principal axis extraction with orthogonal rotation generated a tripartite solution with characteristic values exceeding 1.0, which proved to be theoretically coherent. The three dimensions accounted for 70.089% of cumulative variance, surpassing the 60% threshold deemed satisfactory for behavioral sciences (Table 3).

Dimension 1 (Communal Encouragement and Behavioral Inclination) possessed a characteristic value of 8.925 and accounted for 35.797% of variance. Statements loading on this dimension addressed perspectives regarding breast milk contribution as humanitarian and communal obligation, the societal advantage of milk repositories, contribution endorsement, and willingness for voluntary participation. Dimension loadings spanned 0.646 to 0.880, with Cronbach alpha coefficient of 0.943.

Dimension 2 (Informational and Security Consciousness) possessed a characteristic value of 2.280 and accounted for 20.660% of variance. Statements within this dimension

appraised fundamental knowledge concerning donor milk banking, consciousness regarding control of infectious pathology throughout contribution, and security-related consciousness. Dimension loadings spanned 0.703 to 0.891, with Cronbach alpha coefficient of 0.874.

Dimension 3 (Personal Evaluations and Reservations) possessed a characteristic value of 1.412 and accounted for 13.632% of variance. This dimension encompassed individual assessments, hesitations, and restrictive perspectives concerning breast milk contribution. Dimension loadings spanned 0.530 to 0.847, with Cronbach alpha coefficient of 0.655, situated at the lower acceptability boundary yet adequate for the development of preliminary-stage instruments.

**Analysis of Structural Verification**

Analysis of structural verification was performed on an autonomous sample to corroborate the tripartite configuration identified through dimension reduction.

| <b>Table 3. Results of exploratory factor analysis</b>   |                |
|--|----------------|
| <b>Factors/items</b>   | <b>Loading</b> |
| <b>Factor 1: Social Support and Behavioral Intention (Eigenvalue=8.925, Var=35.80%, a=0.943)</b> |                |
| PAT-HMBS14: Breast milk donation is positively regarded in Turkish culture                       | 0.880          |
| PAT-HMBS17: Establishing milk banks is beneficial for society                                    | 0.797          |
| PAT-HMBS23: I could encourage family/friends to donate milk                                      | 0.769          |
| PAT-HMBS13: Milk donation can be made considering religious precautions                          | 0.765          |
| PAT-HMBS18: Mothers who donate milk should be appreciated  | 0.764          |
| PAT-HMBS21: I would consider donating my milk to another baby                                    | 0.757          |
| PAT-HMBS22: I would accept using donated milk for my baby  | 0.748          |
| PAT-HMBS24: I would voluntarily contribute to milk donation projects                             | 0.700          |
| PAT-HMBS16: Breast milk donation is a humanitarian responsibility                                | 0.697          |
| PAT-HMBS19: Government policies should promote milk donation                                     | 0.682          |
| PAT-HMBS12: Breast milk donation is religiously permissible                                      | 0.646          |
| <b>Factor 2: Knowledge and Safety Awareness (Eigenvalue=2.280, Var=20.66%, a=0.874)</b>          |                |
| PAT-HMBS4: I am aware that medical tests are performed for safety                                | 0.891          |
| PAT-HMBS3: I know infectious diseases can be controlled through screening                        | 0.859          |
| PAT-HMBS2: I have heard of human milk banking before   | 0.836          |
| PAT-HMBS1: I know milk donation is vital for babies without breast milk                          | 0.703          |
| <b>Factor 3: Individual Perceptions and Hesitations (Eigenvalue=1.412, Var=13.63%, a=0.655)</b>  |                |
| PAT-HMBS7: Donor breast milk is safer than formula   | 0.847          |
| PAT-HMBS9: Milk donation can be safely done under proper storage                                 | 0.816          |
| PAT-HMBS5: Milk donation is only for preterm and sick babies                                     | 0.530          |
| Total Variance Explained =70.089%, Overall Cronbach alpha=0.925                                  |                |

The model encompassed three latent constructs: Communal Encouragement and Behavioral Inclination (F1), Informational and Security Consciousness (F2), and Personal Evaluations and Reservations (F3), with their corresponding manifest indicators.

Model correspondence indices signified satisfactory fit:  $\chi^2/df=1.818$  (satisfactory range: 0-5), RMR=0.028, GFI=0.892, NFI=0.927, RFI=0.915, IFI=0.966, TLI=0.960, CFI=0.965, and RMSEA=0.064 (Figure 1). All standardized dimension loadings achieved statistical significance ( $p<0.001$ ): Dimension 1 loadings spanned 0.772 to 0.904, Dimension 2 loadings spanned 0.799 to 0.882, and Dimension 3 loadings spanned 0.872 to 0.881 (Tables 3, and 4, Figure 1).

### Discriminative Capacity

To appraise discriminative capacity of the instrument, independent sample comparisons were undertaken between lowest 27% and highest 27% subgroups based upon cumulative scores. Outcomes revealed statistically significant intergroup differences in cumulative instrument scores and all subscale scores ( $t=-6.99$  to  $-18.75$ , all  $p<0.001$ ), signifying that the instrument possesses robust

discriminative capacity at both aggregate and subscale levels.

### Temporal Consistency

Temporal consistency underwent assessment to scrutinize instrument measurement stability. Paired sample comparisons did not signify any statistically significant differences between initial and repeated administration scores for the cumulative instrument or any subscale (all  $p>0.05$ ). ICC spanned 0.91 to 0.93 and all achieved statistical significance ( $p<0.001$ ) demonstrating superior temporal consistency at both aggregate and subscale levels.

### Descriptive Findings for Instrument and Subscale Scores

Mean cumulative instrument scores of participants were computed as  $33.54\pm 11.50$  (minimum: 18, maximum: 90), and  $19.320\pm 7.780$  (minimum: 11, maximum: 55) within the communal encouragement behavioral inclination subdomain,  $8.170\pm 3.722$  (minimum: 4, maximum: 20) within Informational Security Consciousness, and  $6.050\pm 2.403$  (minimum: 3, maximum: 15) the Personal

| Table 4. Model fit indices |         |                  |                                |
|----------------------------|---------|------------------|--------------------------------|
| Fit index                  | Value   | Acceptable range | Reference                      |
| Chi-square                 | 236.329 | -                | -                              |
| df                         | 130     | -                | -                              |
| Chi-square/df              | 1.818   | 0-5              | Kline <sup>(13)</sup>          |
| RMR                        | 0.028   | 0.05-0.08        | Hooper et al. <sup>(12)</sup>  |
| GFI                        | 0.892   | 0.80-0.95        | Kline <sup>(13)</sup>          |
| NFI                        | 0.927   | 0.90-1.00        | Hu and Bentler <sup>(30)</sup> |
| RFI                        | 0.915   | 0.90-1.00        | Hu and Bentler <sup>(30)</sup> |
| IFI                        | 0.966   | 0.80-1.00        | Hooper et al. <sup>(12)</sup>  |
| TLI                        | 0.960   | 0.80-1.00        | Hooper et al. <sup>(12)</sup>  |
| CFI                        | 0.965   | 0.90-1.00        | Hu and Bentler <sup>(30)</sup> |
| RMSEA                      | 0.064   | 0.05-0.08        | Hu and Bentler <sup>(30)</sup> |

Df: Degree of freedom, RMR: Root Median Square Residual, GFI: Goodness-of-Fit Index, NFI: Normed Fit Index, RFI: Relative Fit Index, IFI: Incremental Fit Index, TLI: Tucker-Lewis Index, CFI: Comparative Fit Index, RMSEA: Root Mean Square Error of Approximation

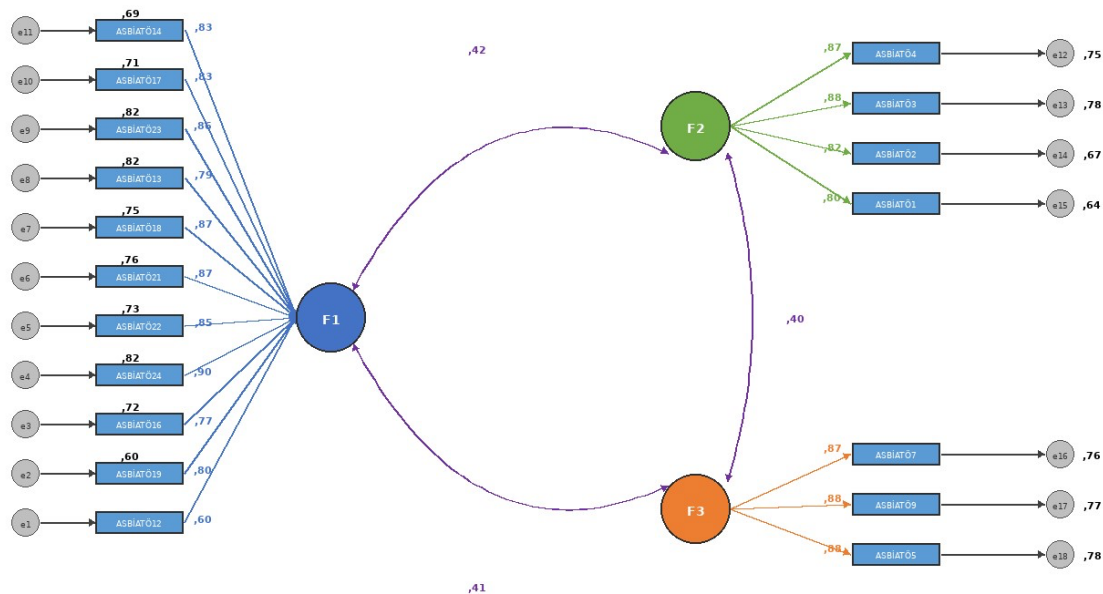


Figure 1. Path diagram of confirmatory factor analysis

Evaluations Reservations subdomains. These findings signify that perspectives and attitudes of participants toward donor milk banking are generally situated at diminished-to-moderate levels (Supplementary Table).

## DISCUSSION

This investigation was undertaken to construct the PAT-HMBS and comprehensively appraise its measurement characteristics. The preliminary Cronbach coefficient alpha of 0.872 signified that statements consistently represented the assessed construct and exhibited satisfactory homogeneity. Coefficient alpha values  $\geq 0.80$  were regarded as indicators of elevated reliability<sup>(22,23)</sup>.

This finding suggests that the instrument constitutes an appropriate measurement-tool for capturing perspectives and attitudes toward donor milk services (Supplementary Table).

Analysis of items disclosed that certain statements exhibited minimal or inverse adjusted statement-scale correlations, signifying inadequate correspondence with the assessed construct. Statement-scale correlations beneath 0.30 furnish robust justification for statement elimination<sup>(24,25)</sup>. The elevation in Cronbach alpha up to 0.925 subsequent to elimination of these statements demonstrates substantially fortified homogeneity and enhanced measurement precision<sup>(23,25)</sup>.

Sampling appropriateness for factorization was corroborated by the KMO coefficient (0.789) and statistically significant Bartlett's sphericity test results, signifying that structure information was suitable for dimensional decomposition<sup>(10,26)</sup>. The tripartite configuration from dimension reduction accounted for 70.089% of cumulative variance, surpassing the 60% threshold advocated for behavioral science investigations which also signifies robust structural validity<sup>(11,24)</sup>.

Scrutiny of subscales disclosed that the elevated variance accounted (35.797%) and superior homogeneity ( $\alpha=0.943$ ) of Dimension 1 signified that Communal Encouragement and Behavioral Inclination constitutes the central constituent of this assessment instrument. This finding aligns with behavioral theoretical frameworks suggesting that contribution behaviors are intimately associated with communal propensities and perceptions of societal obligation<sup>(11,27)</sup>. The robust dimension loadings and elevated reliability ( $\alpha=0.874$ ) of Dimension 2 established that Informational and Security Consciousness constitutes an autonomous and distinguishable cognitive dimension<sup>(10,28)</sup>. Despite Dimension 3 exhibiting diminished variance (13.632%) and acceptable homogeneity ( $\alpha=0.655$ ), this level is deemed adequate for preliminary-stage development of this instrument<sup>(22,25)</sup>.

Outcomes of structural verification corroborated that the tripartite measurement model exhibited satisfactory correspondence with observed data. The  $\chi^2/df$  ratio beneath 2, RMSEA within acceptable boundaries, and elevated CFI, TLI, and IFI values furnished robust evidence for structural validity<sup>(11,12,29)</sup>. The elevated and statistically significant dimension loadings signified that manifest variables reliably reflected their corresponding latent constructs.

Significant intergroup differences detected during discriminative analyses between lowest and highest 27% subgroups demonstrated elevated sensitivity in differentiating individual variations<sup>(24,30)</sup>. Furthermore, elevated ICC values (0.909-0.925) derived from temporal consistency analyses signified that the instrument yields stable measurements across time and demonstrated robust temporal reliability<sup>(31,32)</sup>. These comprehensive findings establish that the PAT-HMBS possesses elevated measurement quality concerning structural validity, discriminative capacity, and reliability, and may be confidently employed within both investigative and clinical contexts.

### Study Limitations

This study has several limitations. First, the cross-sectional design precluded establishing causal relationships

and assessing temporal stability of attitudes. Second, the sample was recruited from a single geographic region, which may limit generalizability to diverse populations with different cultural or religious perspectives toward donor milk banking. Third, reliance on self-reported data introduced potential social desirability bias.

## CONCLUSION

The constructed instrument represents the inaugural psychometrically sound multidimensional tool assessing maternal perspectives and attitudes toward donor milk services in Türkiye, incorporating theological and sociocultural sensitivities pertinent to Muslim communities. It contributes substantially to investigation and practice by guiding developmental processes of culturally appropriate system and also enhancing communal acceptance.

### Ethics

**Ethics Committee Approval:** Ethical authorization was secured from the Amasya University Rectorate–Non-Interventional Clinical Research Ethics Committee on (decision no.: 2025000172, date: 02.10.2025), with institutional clearance obtained from İzmir Bakırçay University Çiğli Training and Research Hospital. All participants received information concerning investigation objectives and methodology, with written authorization secured in accordance with the principles of voluntary participation. The investigation adhered to World Medical Association Declaration of Helsinki–Ethical Principles for Medical Research Involving Human Participants.

**Informed Consent:** Written informed consent was secured from all participants.

### Footnotes

#### Author Contributions

Concept: Ş.K.E., A.M., E.C.E., Design: Ş.K.E., A.M., E.C.E., Data Collection or Processing: A.M., Ö.O., Analysis or Interpretation: Ş.K.E., A.M., E.C.E., Literature Search: Ş.K.E., A.M., E.C.E., Writing: Ş.K.E., A.M., E.C.E.

**Conflict of Interest:** The authors affirm absence of competing interests.

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**Supplementary Table:** <https://d2v96fxpocvxx.cloudfront.net/68ab204c-182b-49da-b227-bc7efe058632/content-images/d7105213-0425-4bf2-a463-dbdb52f03dde.pdf>

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