



## Assessment of Breastfeeding Engagement in Postpartum Women with the UWES-17 scale

### Evaluación del compromiso en el amamantamiento de mujeres puérperas con escala UWES-17

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#### Abstract

Promotion and monitoring of breastfeeding require reliable and valid instruments that allow studying the engagement of itself. Thus, the aim of this study was to analyze the psychometric properties of the Utrecht Work Engagement Scale (UWES-17) for the assessment of engagement in breastfeeding practices among 324 postpartum Argentinian women. The UWES-17, Breastfeeding Self-Efficacy Scale, Postpartum Depression Scale, and a sociodemographic questionnaire were applied. Moreover, reliability, validity, dimensionality, sensitivity, and specificity were analyzed. The UWES-17 demonstrated adequate levels of internal consistency, and its three-dimensional structure was confirmed. Bifactorial analysis supported its usage, and the model verified its external validity. The results validate the UWES-17 as a valid and reliable tool for assessing breastfeeding engagement, thus making it suitable for implementation in clinical and scientific contexts to support interdisciplinary approaches to breastfeeding.

**Keywords:** *breastfeeding, puerperal women, psychometrics, maternal and child health, self-report*

#### Resumen

La promoción y el seguimiento de la lactancia materna necesita contar con instrumentos fiables y válidos que permitan estudiar el grado de compromiso con el amamantamiento. El objetivo fue analizar las propiedades psicométricas de la Escala de Compromiso de Utrecht (UWES-17) para evaluar el compromiso en la práctica del amamantamiento en 324 mujeres puérperas argentinas. Se utilizaron los instrumentos UWES-17, Escala de Autoeficacia para la Lactancia Materna, Escala de Depresión Postparto y cuestionario sociodemográfico. Se analizaron la fiabilidad, validez, dimensionalidad, sensibilidad y especificidad. El UWES-17 mostró niveles adecuados de consistencia interna y se confirmó su estructura tridimensional. El análisis bifactorial confirmó su utilidad y el modelo comprueba su validez externa. Los hallazgos confirman que el UWES-17 es un instrumento válido y fiable para la medición del compromiso en el amamantamiento, ya que puede ser utilizado en el ámbito clínico y científico para el abordaje interprofesional de la lactancia humana.

**Palabras clave:** *lactancia materna, mujeres puérperas, psicometría, salud materno infantil, autoinforme*

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## Introduction

Postpartum is a transitional period accompanied by significant changes and challenges that can affect maternal and infant well-being (Carrizo et al., 2020). In recent years, the study of the development of positive attitudes, skills, and experiences in maternal care has been addressed by the health sciences (Corno et al., 2019). Studies on positive psychology in the postpartum period aim to identify factors which promote optimal functioning and the development of personal resources. By increasing and promoting positive resources, it is possible to successfully counteract negative experiences and psychological disorders during this vulnerable stage (Corno et al., 2019).

Engagement is one of the most well-known theoretical constructs in the field of psychology and it is defined as a positive, persistent, emotional, and cognitive state related to adherence and sustainability in a task (Schaufeli et al., 2002). Maternal engagement refers to the mental state of a woman during infant care tasks (Provenzi et al., 2017). The authors of the theory concluded that engagement consists of three closely related components: vigor, dedication and absorption (Schaufeli et al., 2002). Vigor refers to high levels of energy and resilience while performing a task, that is, willingness to make an effort and persist even when facing difficulties. Dedication involves a high degree of involvement in the task, a sense of its significance, as well as experiencing enthusiasm, pride, inspiration, and challenge. Absorption describes full concentration and task enjoyment. From this perspective, it is known that appropriate maternal engagement is related to positive outcomes, including facilitating attachment and psycho-emotional development, promoting maternal mental well-being, and supporting the practice of breastfeeding,

among other aspects (Carrizo et al., 2020; Corno et al., 2019).

Breastfeeding, as a cultural practice inherent to human beings that requires the postpartum person's commitment, can be studied using self-report instruments (Girard et al., 2016). Postpartum women's engagement to breastfeeding is related to involvement, behavior, personal initiative, performance, and quality in the activity of breastfeeding (Wouk et al., 2020). Relationships between engagement and better mental and physical health can increase motivation, self-efficacy, optimism, and self-esteem, making it opportune to measure this construct in relation to breastfeeding (Wouk et al., 2020). Furthermore, the World Health Organization (2001) declared that both clinical and population-based research are a priority to achieve long-term global goals to increase the engagement of breastfeeding. Therefore, it is necessary for healthcare professionals and researchers to have reliable and valid instruments to assess lactating women's level of engagement in order to develop timely strategies to increase the percentage of breastfeeding.

Consequently, the present study aimed to examine the psychometric properties of the UWES-17 instrument for the assessment of maternal engagement in breastfeeding practices among Argentinian lactating women. Given the need for instruments that provide self-perceived information, there is a fundamental need to adapt and validate them in the local context in which they are intended to be used (Olivera et al., 2023).

## Methods

### *Participants*

An analytical cross-sectional study was carried out, which involved the administration of online self-report questionnaires to 324 postpar-

tum women in Argentina. The inclusion criteria were: adults ( $\geq 18$  years) residing in Argentina who were breastfeeders in the postpartum stage (first twelve months). Participants signed an informed consent before voluntarily participating. This research was approved by the corresponding Research Ethics Committee (REPIS-3177).

### *Instruments*

**Breastfeeding engagement.** The Spanish version of the Utrecht Work Engagement Scale (UWES-17) was used, consisting of 17 items that assess the subscales of vigor, dedication, and absorption (Wouk et al., 2020). Participants rated the frequency at which they have felt the described statements in each item using a Likert-type scale with seven options ranging from never - *not at all* (0) to *always - every day* (6). Schaufeli and Bakker (2004) reported Cronbach's alpha values for the UWES scale ranging from .80 to .90.

For the current study, experts in breastfeeding collaborated in adapting the items to the breastfeeding practice. The Spanish version of the 17-item UWES was modified following the procedure by Guillén and Martínez-Alvarado (2014) for adapting the UWES in non-work contexts. Once the adaptation of the items was completed, a pilot test was conducted with 65 women, and the necessary adjustments were made to obtain the final version of the questionnaire.

**Breastfeeding self-efficacy.** Women's confidence in breastfeeding was assessed using the Spanish version of the Breastfeeding Self-Efficacy Scale-Short form (BSES-SF). The BSES-SF is valid for identifying women who experienced difficulties in breastfeeding and has been used in evaluating support interventions (Oliver-Roig et al., 2012). This instrument consists of 14 positively framed

items with the phrase *I can always* rate on a 5-point Likert scale. The total score ranges from 14 to 70, with higher scores that indicate higher levels of self-efficacy in breastfeeding. Scores above 50 are indicative of adequate self-efficacy in breastfeeding (sensitivity  $> 70\%$  and specificity  $> 50\%$ ) (Nanishi et al., 2015). In this study, the reliability was good ( $\alpha = .87$ ).

**Mood.** The 7-item Spanish version of the Postpartum Depression Screening Scale (PDSS) was used to assess suggestive signs of depressive disorders during the postpartum period (Le et al., 2010). Each item was rated on a 5-point Likert scale. The scores were transformed into a scale ranging from 7 to 35, with higher scores that indicate higher levels of depression (Miranda et al., 2021). In this study, the alpha showed an acceptable value of .83.

**Sociodemographic and health variables.** An ad hoc questionnaire was designed to collect socio-demographic data (age, relationship status, years of education, employment, access to healthcare) and gynaecological-obstetric data (type of delivery, parity, number of pregnancies, postpartum period, gestational characteristics and type of breastfeeding).

### *Statistical analysis*

Statistical analyses were performed using Stata 17 software and included confirmatory factor analysis (CFA) with structural equation modeling techniques (SEM) on the 17 items with the *a priori* identified dimensions (three-dimensional model), compared with the unifactorial model. Traditional goodness-of-fit indices were calculated, and reliability and validity (convergent and divergent) were assessed. Subsequently, a bifactorial model was tested to determine if the measure was sufficiently unidimensional to sup-

port the use of a total score, while still considering the multidimensionality found (Miranda et al., 2020). Internal consistency was evaluated using Cronbach's alpha ( $\alpha$ ), with acceptable values ranging from .60 to .95. Additionally, item correlations ( $r$  coefficients) were calculated to detect potential redundancy among them ( $r > .80$ ) (Miranda et al., 2020). Pearson correlation matrices ( $r$ ) were estimated between the UWES-17 and the BSES-SF to determine convergent validity, while the PDSS was used to study divergent validity. Furthermore, the three questionnaires were integrated into a SEM model to assess nomological validity. Lastly, the sensitivity and specificity of the UWES-17 were studied by plotting ROC curves, using an adequate self-efficacy (BSES-SF > 50 points) as the parameter. The area under the curve (AUC) was estimated, considering that a higher AUC indicates better discrimination in identifying women with self-efficacy: non-discriminatory (< .60), fair (.60 to .69), acceptable (.70 to .79), excellent (.80 to .90), and outstanding (> .90).

## Results

Most women under 35 years old (82%) were in a relationship (96%), and had received at least 12 years of formal education (92.8%). Furthermore, 78% were employed and 86% had private healthcare coverage. Regarding obstetrical and gynaecological data, 56% of the participants were primiparous, 51% were multigravida, and 27% had experienced a previous pregnancy loss. Around 73% were recruited during the first 6 months of postpartum, and exclusive breastfeeding was practiced by 64% of the sample.

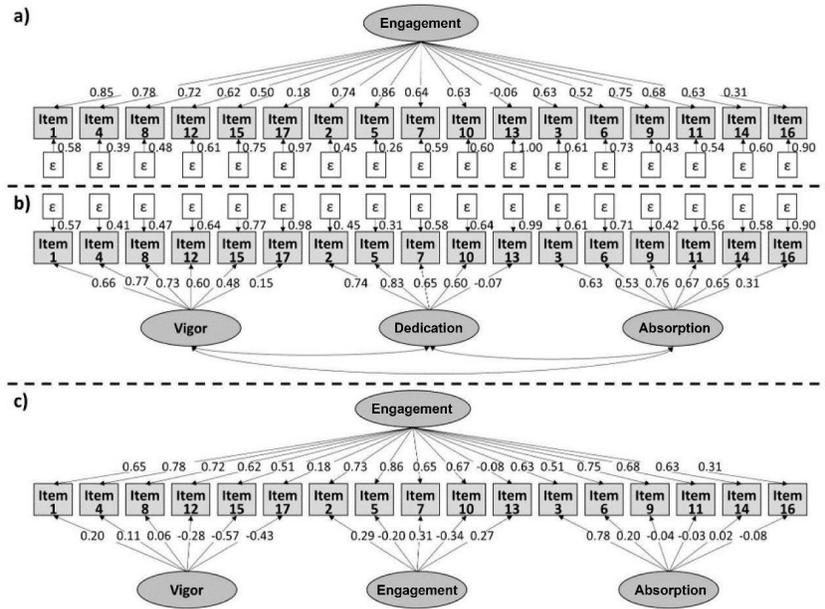
Goodness-of-fit measures are shown in Table 1 for the CFA of the unidimensional and tridimensional models of the UWES-17 for lactation. The indices confirmed that the questionnaire has a tridimensional structure. All indices reached the recommended values:  $\chi^2/df = 2.74$ , CFI = .91, TLI = .90, RMSEA = 0.07, SRMR = 0.05, CD = 0.92, and decreasing AIC and BIC. Figure 1 displays the structural equation models. Furthermore, the CFA supported a bifactorial structure, which demonstrated a superior fit ( $\chi^2/df = 2.62$ , CFI = .92, TLI = .90, RMSEA = 0.06, SRMR = 0.05, CD = .99).

**Table 1**

Fit indices for the confirmatory factor analysis models.

	Expected values	Unidimensional model	Three dimensional model	Bifactor analysis
$\chi^2/df$	$\leq 3.00$	3.61	2.74	2.62
RMSEA	$< 0.08$	0.09	0.07	0.06
CFI	$\geq .90$	.86	.91	.92
TLI	$\geq .90$	.84	.90	.90
SRMR	$\leq 0.08$	0.06	0.05	0.05
CD	$\geq .95$	.93	.92	.99
AIC		18433.12	18331.26	18311.66
BIC	The lower the better	18622.69	18554.28	18571.85

**Note.**  $\chi^2/df$  = chi-square to degree of freedom ratio; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index; SRMR = standardized root mean square residual; CD = coefficient of determination; AIC = Akaike information criterion; BIC = Bayesian information criterion.



**Figure 1**

Structural equations of the unidimensional model (a), tridimensional model (b), and bifactorial model (c) of the UWES-17 for breastfeeding engagement.

Regarding dimensionality, the correlations were below .90. The questionnaire achieved very good reliability for the entire instrument, with  $\alpha = .89$ . The factor with the highest  $\alpha$  value was vig-

or ( $\alpha = .76$ ), followed by absorption ( $\alpha = .75$ ), and dedication ( $\alpha = .63$ ). Additionally, the  $\alpha$  coefficients did not significantly change after the removal of each item (Table 2).

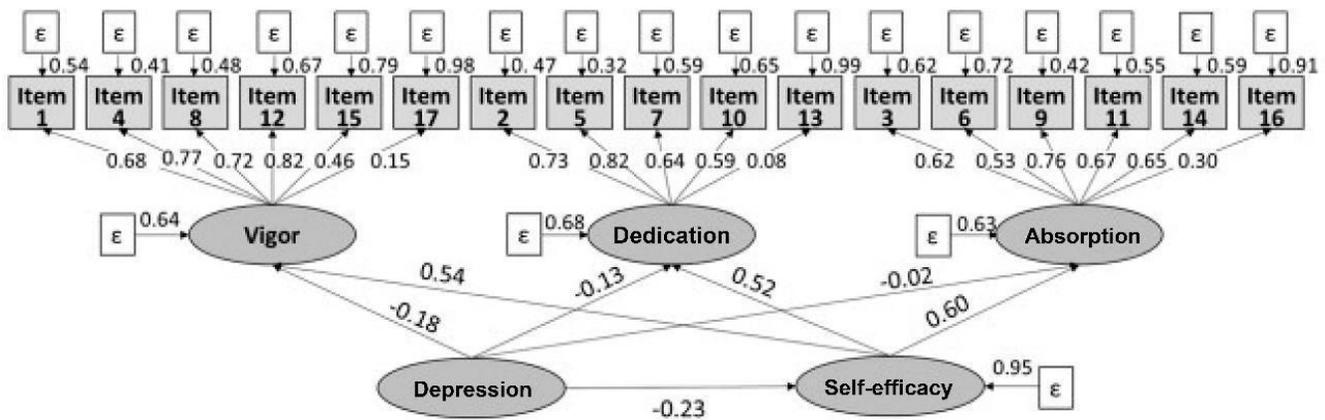
**Table 2**  
Analysis of the reliability of the UWES-17 for breastfeeding engagement.

Item	IT	IR	Alpha
1	.64	.58	.88
2	.73	.68	.87
3	.66	.60	.80
4	.76	.71	.87
5	.81	.78	.87
6	.57	.49	.88
7	.66	.60	.88
8	.73	.67	.87
9	.74	.70	.87
10	.63	.59	.88
11	.68	.65	.88
12	.67	.62	.87
13	.15	.02	.90
14	.68	.62	.87
15	.57	.50	.88
16	.39	.30	.89
17	.27	.20	.89

**Note.** IT = item-test correlation; IR = item-rest correlation;  $\alpha$  = alpha after item deletion.

Subsequently, the correlation between the UWES-17 and PDSS-SF was analyzed to assess divergent validity. The PDSS was inversely correlated with the total score of the UWES-17 ( $r = -.19, p < .01$ ), vigor ( $r = -.25, p < .01$ ), dedication ( $r = -.13, p < .01$ ), and absorption ( $r = -.14, p < .01$ ). As for convergent validity, the UWES-17

showed significant positive correlations with the BSES-SF ( $r = .55, p < .01$ ). It also correlated with vigor ( $r = .61, p < .01$ ), dedication ( $r = .33, p < .01$ ), and absorption ( $r = .51, p < .01$ ). Furthermore, a theoretical model was designed to study the multivariate relationship of the questionnaires through SEM analysis (Figure 2).



**Figure 2**  
Nomological validity of the UWES-17 for breastfeeding engagement.

The results indicated a good fit between data and structural model:  $\chi^2/df = 2.73$ , RMSEA = 0.07, CFI = .91, TLI = .88, SRMR = 0.06, CD = .29. Therefore, the SEM provided evidence of nomological validity for the instrument. The direct effects of postpartum depression (PDSS) and self-efficacy on the components of engagement (UWES-17) are shown in Figure 2. The results showed that postpartum depression negatively predicted vigor ( $\beta = -.18, p < .01$ ) and dedication ( $\beta = -.13, p = .02$ ) in breastfeeding practice. On top of that, it was found that self-efficacy in breastfeeding had positive effects on vigor ( $\beta = .54, p < .01$ ), dedication ( $\beta = .52, p < .01$ ) and absorption ( $\beta = .60, p < .01$ ).

The standardized scores of the UWES-17 stratified by parity are presented as mean, standard deviation, and percentile ranges in Table 3. The scores were similar for both groups, and the means of the participants in the UWES-17 subscales were above the 25th percentile.

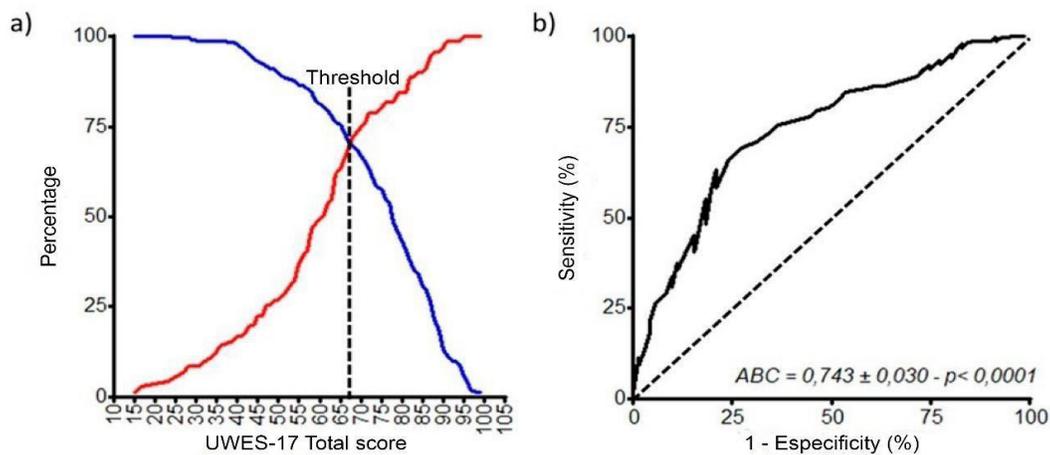
Finally, a cutoff point of 67 demonstrated the optimal balance between sensitivity (70.94%) and specificity (69.01%) (Figure 3a). A ROC curve was calculated (Figure 3b) to identify the relative sensitivity/specificity of the UWES-17 instrument compared to the comparison instrument (BSES-SF). The AUC for the UWES-17 was 0.74 (SE = 0.03;  $p < .01$ ).

**Table 3**

Means, standard deviations, and percentiles of the total UWES and its subscales.

Parity	Score	n	M	SD	P5	P10	P25	P50	P75	P90	P95
Multiparous	Vigor	128	26.06	7.18	13	16	21	27	32	34	35
	Dedication	128	21.01	6.09	10	13	18	22	26	29	29
	Absorption	128	23.91	6.74	11	15	20	25	29	32	33
	UWES total	128	70.98	18.39	36	44	59	76	86	90	94
Primiparous	Vigor	177	25.82	7.21	14	16	21	27	31	35	36
	Dedication	177	20.66	5.34	11	13	17	22	24	28	29
	Absorption	177	23.38	7.16	10	13	19	25	29	32	33
	UWES total	177	69.86	17.76	39	45	58	71	84	90	94

Note. M = mean; SD = standard deviation; P = percentile.

**Figure 3**

Sensitivity-specificity curves (a) and receiver operating characteristic (ROC) curves (b) of the UWES-17 questionnaire.

## Discussion

This study aimed to examine the psychometric properties of the UWES-17 scale for assessing breastfeeding engagement in Argentinian women. The UWES-17 scale demonstrated satisfactory levels of internal consistency, structural validity, convergent validity, divergent validity, and nomological validity, making it

useful for assessing the degree of breastfeeding engagement. The evaluation of validity and reliability is one of the most fundamental aspects in the development, evaluation, and use of instruments (Chan, 2014). Furthermore, having valid and reliable instruments is crucial for healthcare professionals to identify women with lower engagement to breastfeeding and implement interventions that ensure the promotion and mainte-

nance of lactation (Chambers et al., 2007).

Regarding reliability, the UWES-17 showed adequate levels of internal consistency, indicating that the items are coherent with each other and measure the same construct (Adamson & Prion, 2013). The alpha coefficients were satisfactory both overall and for each of the factors. There was no substantial improvement in internal consistency after removing items, and the analysis of item-item correlations did not identify ambiguities, indicating that all 17 items should be retained. These results are consistent with previous studies, which demonstrate that the UWES-17 is a reliable instrument for measuring engagement in work (Schaufeli et al., 2002), academic (Wickramsinghe et al., 2018) and sports activities (Guillén & Martínez-Alvarado, 2014).

Traditionally, this instrument has shown a three-dimensional structure: vigor, dedication, and absorption (Schaufeli et al., 2002; Gómez-Garbero et al., 2019). In this study, its three-dimensionality was confirmed in the adapted version for breastfeeding, which yielded satisfactory goodness-of-fit statistics. In accordance with current recommendations, a bifactor analysis was carried out to ascertain whether the UWES-17 could identify the presence of engagement in breastfeeding as a latent dimension underlying the total score of the UWES-17 (Morin et al., 2020). Bifactor analysis is used to determine if a measure is sufficiently unidimensional to support the use of a total score while still accounting for multidimensionality (Reise et al., 2007). Therefore, UWES-17 scores can be interpreted both from the scores of its factors and the overall score, which is relevant for a comprehensive approach to breastfeeding and the development of specific guidelines that consider various postpartum health scenarios (Smorti et al., 2020). Following the logical reasoning proposed by the authors of the engagement theory (Schaufeli et al.,

2002), committed postpartum women demonstrate vigor, dedication, and absorption in breastfeeding, where vigor is manifested by energy, mental resilience and willingness to make efforts to complete breastfeeding. Faced with challenges, these women remain persistent. A committed postpartum woman also perceives her breastfeeding practice as meaningful, addressing tasks with care and dedication. Additionally, engagement is characterized by absorption; this means that postpartum women are fully concentrated on the task of breastfeeding, where time seems to pass quickly, and they may even experience some difficulty in disengaging from it (Schaufeli et al., 2002).

Once the reliability of the UWES-17 and its dimensionality were confirmed, the analysis of convergent and divergent validity was carried out by contrasting it with instruments that directly (convergent validity) and indirectly (divergent validity) assess related theoretical dimensions. When evaluating divergent validity, the UWES-17 showed an inverse correlation with postpartum depression. These findings are consistent with previous research on postpartum depression and breastfeeding, which indicate that postpartum depression symptoms can compromise breastfeeding (Avilla et al., 2020). Convergent validity was confirmed by calculating the associations between the UWES-17 and self-efficacy in breastfeeding, which were directly correlated. This result is expected since self-efficacy refers to the belief in one's own capabilities to organize and execute the necessary actions to achieve certain goals, in this case, breastfeeding (Ghasemi et al., 2019). Self-efficacy is a cognitive resource necessary for establishing adequate engagement, as a strong sense of self-efficacy can contribute to achieving a balance between the various demands faced by women during lactation (Miranda et al., 2020). Additionally, self-efficacy indicates a person's motivation and willingness to make consistent

efforts in line with their abilities (Ghasemi et al., 2019). Self-efficacy is a key motivational belief that has been conceptually and empirically linked to self-regulatory beliefs. Moreover, self-regulatory efficacy refers to beliefs about using self-regulated learning processes, such as goal setting, self-monitoring, strategy use, self-evaluation, and self-reaction (Zimmerman et al., 2005).

Furthermore, all three questionnaires were included in a SEM model to test nomological validity, which confirmed the associations between them with an adequate level of fit. Nomological validity functions as an additional approach to evaluate the construct validity of a questionnaire, ensuring that the observed correlations between variables are aligned with theoretical or hypothetical relationships (Hair Jr et al., 2020). In the present study, the verification of nomological validity indicates that the structure of the UWES-17 aligns with the theoretical assertions in the literature, where the level of engagement depends on a person's psychological capital (Schaufeli, 2013). These results highlight the need to take care of women's mental health during the postpartum period. This is the reason it is important to provide specific support for breastfeeding to women with psychological difficulties, as previous research has emphasized (Borra et al., 2015). In this regard, lactation consultations have been shown to improve breastfeeding self-efficacy and maternal mental health (Chrzan-Dętkoś et al., 2021).

Finally, standardized scores of the UWES-17 stratified by parity are presented since it is one of the main factors predicting the initiation and maintenance of breastfeeding (Chang et al., 2019). Similar to previous findings where a score below 70 identified employees at psychological risk (Roelen et al., 2015), the cutoff point of 67 demonstrates the optimal trade-off between sensitivity (70.94%) and specificity (69.01%). Therefore, it is recommended to use a UWES-17 score

of 67 as a cutoff point when screening to predict the level of breastfeeding engagement. Scores equal to or below 67 can be taken as indicators of the need for interventions to support breastfeeding and identify possible risk factors, such as postpartum depression.

Lastly, it is necessary to acknowledge some limitations. We recommend that future research studies breastfeeding engagement longitudinally in order to identify risk factors and promoters. Additionally, conducting research in clinical populations, such as women and/or infants with health conditions that hinder breastfeeding, is suggested to improve applicability. Despite these limitations, our findings contribute to the existing evidence and raise new questions.

In conclusion, the UWES-17 is a reliable and valid questionnaire for assessing breastfeeding engagement. Our findings suggest that the UWES-17 is an appropriate tool for identifying women at risk of suboptimal breastfeeding outcomes and can provide a strategy to recognize those who may benefit from breastfeeding interventions. Having appropriate tools to comprehensively address women's health during the postpartum period is crucial for healthcare professionals and scientists, as establishing breastfeeding engagement serves as a long-term indicator of lactation sustainability.

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