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Greek Validation of the Questionnaire "Prenatal Breast-Feeding Self Efficacy" Scale

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ABSTRACT

Background: Empowerment and support for maternal breastfeeding self-efficacy are a worldwide effort. Mothers who demonstrate high levels of self-efficacy are more likely to maintain and succeed in exclusive breastfeeding. There is research evidence that the Prenatal Breast-feeding Self-Efficacy Scale (PBSES) is a reliable and valid tool for evaluating breastfeeding self-efficacy before delivery.

Research Aim(S)/Question(S): The aim of this study was to translate and validate the Prenatal Breastfeeding Self Efficacy scale (PBSES) into the Greek Language. Screening tools like the PBSES scale facilitate the development of individualized strategies to support breastfeeding.

Methods: The Prenatal Breastfeeding Self Efficacy Scale constructed by Wells et al (2006) consists of 20 items that assess the ability of pregnant women to breastfeed. The present study included 156 primiparous pregnant women who intended to give birth at the same maternity perinatal hospital in Athens with no prior experience of breastfeeding.

Results: The reliability of the questionnaire Prenatal Breastfeeding Self-Efficacy was detected by 70% of all the questions. The internal consistency of all items of the questionnaire was assessed overall with a Cronbach's an index of 0.83 while the questions were grouped into 4 factors, as in the original.

Conclusions: The PBSES proved to be a useful tool that can be implemented in Greek and can successfully identify mothers with low self-efficacy prenatally.

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Introduction

Breastfeeding is a gift for every mother to her baby and its beneficial effects contribute to the strengthening, protection and resistance of the immune system against various microbes and viruses and sudden death syndrome, resulting in the reduction of mortality and morbidity especially in the first months of life [1].

However, many factors inhibit the initiation of exclusive breastfeeding (particularly for the period of the first six months and its continuation until the age of two [2]. Recent data, both international and national research data, showed that while a high percentage of new mothers initiated breastfeeding, that percentage decreased dramatically over time, especially in maintaining

exclusive breastfeeding [3,4,5].

Despite this, according to the most recent national research on breastfeeding in Greece conducted in 2018 the exclusive breastfeeding rate within 1 h after birth was 65%, which gradually declined to 0.78% by the 6th month. The rate of total breastfeeding was 94.5% which declined to 45%. However, a new study in 2022 among baby friendly hospitals showed better results but far from the WHO goal [4-6].

Some of the factors that inhibit breastfeeding are mothers' perception of inadequate milk, nipple scarring, congestion, mastitis, breast abscesses, and flattened nipples [7]. In particular, pain caused by mastitis affects breastfeeding maintenance in a percent 20-80% of women [8].

There are also postpartum mothers who have the perception that their milk is not enough and their baby looks hungry, bites them, or refuses to breastfeed, finally they end up giving formula milk as a supplement to breastfeeding. Furthermore, apart from the young woman's perception, the environment around her could positively or negatively influence the continuation of breastfeeding or the initiation of formula [9-11]. On the other hand, there is an indication that maternal health after childbirth and breastfeeding problems could contribute independently to maternal mood creating a vicious circle between the impression of the insufficient effectiveness of breastfeeding, the guilt caused by this and the worsening of mental instability, which is a special feature of the postpartum period Recently, in a systematic review, it was confirmed that there are specific biopsychosocial factors that positively or negatively influence the breastfeeding process Many strategies have been designed and implemented to encourage new mothers and support breastfeeding so as to promote lactation for a period of more than six months by reinforcing collaboration with the community and family members, mothers' confidence building, the appropriate ratio of staff levels and the development of communication skills [8,12,13]. Among these strategies is the strengthening of her self-esteem and self-efficacy in terms of her child's satisfaction.

For that reason, empowerment and support for maternal breastfeeding self-efficacy indicates ones perceived ability to succeed in a particular situation and in the present research that of the mothers breastfeeding self-efficacy [14,15]. Breastfeeding is a worldwide effort that advocates breastfeeding exclusively for the first six months of the infant's life, until the complete transition to solid foods in order to build and organize healthy, intelligent and productive societies [16-18]. Moreover, experiencing maternity care practices supportive of breastfeeding helps mothers meet their breastfeeding intentions to maintain and succeed in exclusive breastfeeding as they depict greater confidence in their ability [19]. However, planning strategies must be based on the positive intention of each mother to breastfeed [20]. Additionally, it seems that prenatal education could have a positive effect on mothers' intention to breastfeed, simultaneously strengthening their self-confidence, which plays a decisive role in achieving not only the initiation but also the maintenance of breastfeeding The aim of this study was to validate the " Breastfeeding Self -Efficacy Scale" in the Greek language, a useful tool that predicts the mother's self-efficacy in breastfeeding. Based on these results, an individualized strategy tailored to each mother could be advocated to ensure breastfeeding duration by enhancing their confidence [21].

Methods

Research Design

This research was a validation study of a wider prospective doctoral thesis clinical trial concerning stress management and breastfeeding promotion. The validation of the Prenatal Breastfeeding self-efficacy scale in the Greek language would indicate new mothers' concerns, challenges and needs regarding breastfeeding practices. Thus, they will be able to receive early information, which will increase their self-confidence and prepare them to face any initial difficulties with breastfeeding. Additionally, the validation of the questionnaire in Greek could confirm the correct perception and use by the participating population of the study so it could be compared with other investigated factors that have been used in the same time. The study was approved by the general assembly of the special composition of the medical school of Athens on the date 04-07-2017 and the scientific committee of the Public General and Maternity Hospital "ELENA VENIZELOU" in Athens, during its 28th regular meeting on the date 08-23-2017.

Setting and Relevant Context

The research was conducted in a tertiary public general and maternity hospital that is certified as Baby Friendly (BF) following the global criteria for implementing the Baby Friendly Hospital Initiative (BFHI) since November of 2011 including adherence to the Ten Steps to Successful Breastfeeding. In addition, the hospital has a psychoprophylactic department that prepares couples or pregnant women for childbirth and labor procedures and offers a breastfeeding preparation course as well as a course regarding the care of the newborn.

After birth, mothers and newborns remain until the 4th day of the baby's life until the establishment of a breast milk supply. All mothers were supervised by midwives and received assistance in practicing the breastfeeding technique and are supported by the special breastfeeding department of our hospital. Additionally, it is noted that after leaving the maternity hospital, there is no organized primary health monitoring network for both postpartum mothers and the newborns, as well as for the breastfeeding procedure and specifically the maternal mental state.

Consequently, after maternity hospital discharge, breastfeeding home support of both the broader physical and mental health of mothers and babies including breastfeeding support are limited to phone-calls with the corresponding breastfeeding department of our public hospital, to online sites of groups that support breastfeeding and to non-profit companies that promote planning and development of programs and actions for the care and support of the pregnant woman, the new mother, the newborn and the family.

Sample

The present study population included pregnant women. The inclusion criteria were as following: a) enrollment in the study should take place between the 15th and 20th week of pregnancy b). All pregnant women were primiparous c). They did not have prior experience with breastfeeding, d). All pregnant women should have received the same quality of care during and after labor in accordance with the rules and conditions of certified baby-friendly hospitals. e). All pregnancies should be attended by obstetricians of the same hospital and f). Greek is native language.

The questionnaire was administered at two separate times: 1) between 15 and 20 weeks of gestational age (1st phase), at the beginning of the second trimester of pregnancy and 2) between

36 and 40 weeks of gestational age (2nd phase), at the end of the pregnancy.

Of the participants, 310 pregnant women were randomized but 162 agreed to participate. In the first phase 156 pregnant women responded and 6 never answered while in the second phase 95 pregnant women responded. In a total 251 questionnaires were completed.

In this study, the mean age of the participants was 34 years old and a significant percentage of them had received higher education, while the average annual family income was between 10.000 – 20.000 euros, moderately covering their financial needs. (Table 1)

Table 1: Pregnant Demographics

	Percentage	Mean
Educational Level		
inability to read and write	0%	
Primary	0%	
High School	0%	
Lyceum	7.26%	
Institute of Professional Training or technical Vocational education	13.80%	
Higher educational Institutet	42.10%	
MSc/PhD	36.80%	
Age (in years)		33.9
<25	3.20%	
25-35	56.60%	
>35	40.20%	
Marital Status		
maried	72.10%	
Sigle /divorced	27.80%	
Family annually Salary		10000-20000
destitute	1.25%	
<10000	8.80%	
10.000-20.000	49.68%	
20.000-30.000	25.15%	
30.000-40.000	5.03%	
>40.000	1.88%	
Pandemic Covid 19		
Participation before	53.70%	
Participation after	46.30%	

Cultural and Conceptual Adaptation

The 18 of the 20 questions of the questionnaire had a conceptual identity during the translation from English to Greek and vice versa. In only two questions it was necessary to change the synonymous corresponding word from English to Greek, with another one that had a greater conceptual relevance as seen below: In question 1, the phrase "I can make time…", was conceptually translated into the phrase "I can find time and in Question 8, the phrase "to find out …" was translated based on the interpretation of the idiom of the English language, as ..."to discover..." or "... to find and learn..."

Analysis and Factors Classification

Question analysis revealed five classification groups - factors initially. Questions 1-5 and 20 were classified as the first factor. The second factor included questions 8-12, 15 and 19, the third factor included questions 15-19, the fourth factor included questions 13, 14, 16 and the fifth factor included questions 4-9. (table 1a) The questions on the first factor concerned mother's ability to breastfeed. Although question 20 was loaded with a low correlation value, conceptually it seems to be coherent with the rest of the same group referring to breastfeeding ability for one year as a maternal breastfeeding skill.

The questions loaded on the second factor concerned mother's information about breastfeeding. It was noticed that questions 8 "I can find out what I need to know about breastfeeding my baby" and 9 "I can find the information I need about problems I have breastfeeding my baby" were registered both in the second and fifth factor but with lower loading values in the last one. Therefore, due to the better loading and conceptual relevance questions 8 and 9 remained in the second factor. On the other hand, questions 15 and 19 were loaded on both the second and the third factor, with greater numerical and conceptual relevance to the third factor. Finally, in the second factor, remained questions 8 – 12 (Table 1a).

The questions loaded on the third factor were conceptually related to the partner's influence on breastfeeding. This suggests an inner sense of embarrassment during the process of breastfeeding in front of the partner but less in relation to third parties or other relatives. Question 19 "I can talk to my partner about the importance of breastfeeding my baby "also seems to be related to the rest of the same group, as it refers to the partner and the influence that the mother can have on him to convince him of the benefits of breastfeeding. In addition, it seems that question 18 "I can choose to breast-feed my baby even if my family does not want me to" was loaded exclusively in the third factor, which means that pregnant women consider their partner as their family and not the wider family from which they originate. However, question 16 "I can breastfeed my baby without feeling embarrassed" was loaded into two factors: the third and the fourth, with greater relevance both numerically and conceptually to the fourth factor. Thus, finally, the third factor is formed by questions 15, 17, 18, and 19. (Table 1a) In the fourth factor, questions according to the way they were answered, were about the influence of the wider environment and other people on breastfeeding. (Table 1a) Questions 4-9 were entered into a separate 5th group by the system. However, questions 4-5 and 8-9 were simultaneously loaded in the 1st and 2nd groups respectively with higher values as seen from the principal components analysis (Table 1a). Thus, in the fifth factor 2 elements (questions 6 and 7), remained, which concerned skills of a technical nature, but conceptually they could well be merged in the first factor, which generally concerned the new mother's breastfeeding skills.

The above reasoning approach of the relevance of questions 6 and 7 to the first group was verified in the analysis in which a 4-factor solution was requested according to the questionnaire manufacturers [23]. Indeed, questions 6 and 7 "I can use a breast pump to obtain milk" and "I can prepare breast milk so others can breast-feed my baby" respectively, were automatically classified as Factor 1. Finally, Factor 1 included questions 1-7 and 20, factor 2 questions 8-12, factor 3 (the 4th according to Wells) questions

15, 17, 18, 19 and factor 4 (the 3rd according to Wells) questions 13, 14, 16. (Tables 1a-1b)

In both periods of the study, the picture of the loading of the answers was similar (Tables 1a-1b and 2a-2b).

Phase A

Table 1a: Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
q1	.830				
q2	.845				
q3	.813				
q4	.629				.370
q5	.666				.313
q6					.830
q7					.751
q8		.606			.414
q9		.611			.432
q10		.775			
q11		.718			
q12		.724			
q13				.829	
q14				.871	
q15		.321	.630		
q16			.373	.716	
q17			.804		
q18			.866		
q19		.437	.694		
q20	.486				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Table 1b: Principal Component Analysis-Structural Validity and Internal Reliability of the Scale

Rotated Component Matrix				
Questions	**Factors**			
	1	2	3	4
q1	0.774			
q2	0.801			
q3	0.698			
q4	0.728			
q5	0.734			
q6	0.590			
q7	0.564			
q8		0.677		
q9		0.686		
q10		0.751		
q11		0.715		
q12		0.664		
q13				0.830
q14				0.872
q15			0.617	
q16				0.708
q17			0.807	
q18			0.872	
q19			0.648	
q20	0.556			
Cronbach's a	0.86	0.79	0.80	0.81

Phase B

Table 2a: Rotated Component Matrix[a]

	Component				
	1	**2**	**3**	**4**	**5**
Q1	.845				
Q2	.871				
Q3	.822				
Q4	.626				.409
Q5	.709				.306
Q6					.866
Q7					.752
Q8		.604			.393
Q9		.709			
Q10		.761			
Q11		.693			
Q12		.765			
Q13				.830	
Q14				.867	
Q15		.319	.600		
Q16			.372	.704	
Q17			.822		
Q18			.872		
Q19		.455	.677		
Q20	.528				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Table 2b : Rotated Component Matrix[a]

	Component			
	1	2	3	4
Q1	.785			
Q2	.801			
Q3	.731			
Q4	.744			
Q5	.770			
Q6	.605			
Q7	.599			
Q8	.434	.621		
Q9		.721		
Q10		.756		
Q11		.694		
Q12		.754		
Q13				.824
Q14				.863
Q15		.322	.600	
Q16			.374	,701
Q17			.823	
Q18			.872	
Q19		.468	.672	
Q20	.540			
Cronbach's a	.87	.82	.81	.80
Cronbach's a (total)	.88			

Extraction Method: Principal Component Analysis.
Rottion Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations

Correlations between Phase 1 and 2

During the descriptive analysis of the responses of the questionnaire subjects in the two different time periods, the following were found (Table 3):

	Phase 1 (Mean±SD)	Phase 2 (Mean±SD)	
Questions	Factor 1		p
q1	4.04±1.03	4.05±1.04	0.364
q2	4.11±0.97	4.12±0.96	0.807
q3	4.09±0.93	4.11±0.93	0.058
q4	3.36±1.28	3.45±1.24	0.239
q5	3.68±1.19	3.71±1.19	0.636
q6	3.60±1.22	3.59±1.21	0.384
q7	3.95±1.08	3.96±1.09	0547
q20	3.35±1.30	3.35±1.28	0.312
Total scoring (max 40), ≈ 75% max	30.14±6.40	30.29±6.44	
	Factor 2		p
q8	4.69±0.59	4.66±0.61	0.511
q9	4.53±0.87	4.55±0.82	0.004
q10	4.72±0.58	4.70±0.60	<0.001
q11	4.48±0.93	4.46±0.96	<0.001
q12	4.50±0.85	4.49±0.86	0.001
Total scoring (max 35), ≈ 66% max	22.91±2.90	22.86±2.99	
	Factor 3		p
q13	3.87±1.45	3.86±1.46	0.236
q14	3.21±1.58	3.20±1.58	0.138
q16	4.17±1.09	4.21±1.07	0.869
Total scoring (max 15), ≈73% max	11.25±3.54	11,28±3,50	
	Factor 4		p
q15	4.89±0.31	(4.89±0.31)	0.118
q17	4.70±0.59	(4.70±0,58)	0.218
q18	4.81±0.44	(4.80±0.45)	0.004
q19	4.86±0.34	(4.86±0.35)	0.109
Total score	19.25±1.36	(19.27±1.38)	0,109
M¨T: ΜέσηSD: Standard Deviation			

In factor 1, the highest value was noted in question 2, in both phases of the study (mean score 4.08±0.90 in the first phase and 4.12±0.96 in the second phase), and the lowest in question 20 (with a mean score of 3, 48±1.30 and 3.35±1.28 respectively) without statistical difference between the phases. From the above, it is clear that the questions concerning belief in the new mother's ability and willingness to breastfeed were answered with a high score from the beginning of the second trimester. However, they remained hesitant regarding the duration of breastfeeding until their babies were one year old.

In factor 2, the highest value (in both phases) was in question 10 (mean score 4.72±0.58 and 4.70±0.60, respectively), while the lowest in question 11 (mean score 3.67±1, 26 and 4.46±0.96 respectively). The most statistically significant differences appeared for all questions except for question 8. From the above, it seems that the information schedule that was followed has helped new mothers gain knowledge, but without being convinced of their ability to faithfully apply it, since they were for first-time mothers.

In factor 3, the highest value was noted in question 16 with mean scores of 4.18±1.09 and 4.21±1.07 for the first and the second phase, respectively, and the lowest in question 14 with mean values 2.98±1.47 and 3.20±1.58 in phase A and B respectively. The results showed that the end of the educational program expectant mothers believed that they would appear less embarrassed and less shamed to breastfeed in front of strangers and consequently would reveal an improvement in their decision to breastfeed, but without statistical differences between the responses of the two phases. The non-statistically significant difference is probably due either to their pre-decided attitude towards breastfeeding or the possibly insufficient number of the study sample.

In factor 4, the highest value was noted in question 15 (mean score 4.89±0.31 and 4.80±0.57 for phase A and B), and the lowest in question 17 (with mean score 4.80±0.54 and 4.70±0.58 respectively but with no significant differences between the phases in contrast with question 18 which presented a significant statistical difference between the two time points of the questionnaire administration

(p=0.004). This could be explained by the influence of comments about breastfeeding from the pregnant woman's wider environment which became more pronounced as pregnancy progressed and began to appear.

A comparison of the responses between the two time points revealed that questions 2,10 and 15,17,19, almost all factor 3, concerning the perception of breastfeeding in front of relatives and social pressure, did not correlate satisfactorily. Therefore, they were not answered with the same manner or with the same reasoning. Despite the similar mean values, it seems that some women perceive these questions differently in the second phase of the study (table 4).

Table 4: Correlations of Answers Phase 1 - Phase 2

Questions	Coefficient r (Pearson)	p
q1	0.404	<0.001
q2	0.137	0.189
q3	0.405	<0.001
q4	0.369	<0.001
q5	0.337	<0.001
q6	0.266	0.010
q7	0.219	0.035
q8	0.286	0.005
q9	0.305	0.003
q10	0.132	0.207
q11	0.341	0.001
q12	0.367	<0.001
q13	0.569	<0.001
q14	0.737	<0.001
q15	0.206	0.049
q16	0.263	0.011
q17	0.112	0.285
q18	0.268	0.009
q19	0.238	0.022
q20	0.429	<0.001

Comments

The literature review revealed two translations and validations of the Prenatal Breastfeeding Self-Efficacy Scale, in Spanish and Turkish in addition to the original questionnaire by Wells et al [27,28]. In contrast to previous studies, this validation of the prenatal breastfeeding efficacy scale in the Greek language, included a sample of only primiparous women with no previous experience of breastfeeding or childbirth. In addition, the questionnaire was completed at two specific time -points in pregnancy: the first one was: at the beginning of pregnancy where the pregnant women were not prepared or aware of their baby-impending arrival. The second one was : the completion of the questionnaire was shortly before they gave birth, as it was preceded by a well-organized information about all the procedures and their questions answered. The lack of previous negative or positive experiences in breastfeeding in our population, leads to a high rate of spontaneous initial intention to breastfeed of the expectant mother at the beginning of pregnancy, reflecting the excitement of a successful pregnancy and the emotional desire of their first baby's arrival, which overlaps any anxiety and insecurity about the unknown [29].

The participant exclusion criteria in our validation were similar to those used in previois study. Additionally, according to the factor analysis the items of the questionnaire in Greek population were loaded and distributed in factors with the same manner as in Spanish study, setting question 20 – "I can breastfeed my baby for one year" - in the relevant factor with the questions of abilities and skills of the new mother (factor 1 = questions 1-7,20).

This indicates that future mothers interpret the duration of breastfeeding as their ability and skill to preserve their milk, regardless of socioeconomic pressure and work demands [10]. Perhaps, this way of thinking stems from the financial and social support of the new nuclear family. Supporting motherhood and protecting breastfeeding in the first six months of an infant's life and beyond for a working mother presupposes good financial benefits with concurrent educational programs for all extended families that it will involve in infants rearing [30-36].

Additionally, question 19 was loaded in the group regarding the partner's influence on breastfeeding and social pressure (e-questions 15,17,18,19) in both Spanish and Greek validation studies while in the analysis by Wells et.al. Question 19 remained unclassified.

Indeed, the new mother seems to believe that she could convince her partner of breastfeeding benefits so that he would support her to have a positive effect on this venture. It is also impressive that question 15"I can breast-feed my baby when my partner is with me" in the Greek validation loads in the factor which includes questions referring in partner support, while in the other two validation studies (Spanish and Anglo-Saxon) it loads in the factor of the questions that mentioned on breastfeeding in front of third

parties commenting on it with a sense of shame. Obviously, the different way in which question 15 was answered indicates the influence of the partner on the new mother regarding breastfeeding. In general, the process of breastfeeding seems to be dependent on the morals, customs and social structure of people or nations under cultural and religious influences [37-41].

Limitations of the Validation Study

The answer to the "Prenatal Self-Efficacy of Breastfeeding" questionnaire was part of a wider unpublished clinical study on successful breastfeeding taking into account many other parameters. The inclusion of primiparous pregnant women with specific gestational ages limited the sample.

Although there was a structural education program, infinite, uncontrolled and unfiltered internet information about breastfeeding could be an unadjusted parameter of influence.

The population of pregnant women who participated was small compared to previous measurements but capable of drawing conclusions [22]. In addition, the administration of the questionnaires over a time interval longer than 15 days, was a deterrent to being evaluated twice under the same conditions [42]. However, it provided useful information regarding the change in women's impression of the intention of breastfeeding in relation to the gestational age and the maturation of the idea, shortly before the birth of their baby. Finally, in this study, confirmation factor analysis was not considered necessary because the structure of the questionnaire had already been determined by its creators.

Conclusions

The questionnaire "Prenatal Breastfeeding Self-Efficacy Scale" is considered suitable screening tool for detecting the new mother's intention to breastfeed, highlighting her possible concerns and addressing her need for learning techniques around breastfeeding her baby.

It also detected her fears and doubts about the effects of various social factors that could affect her after giving birth. Thus, by analyzing and possibly addressing he needs of each pregnant woman individually based on the questionnaire, the prenatal purpose of the new mother's self-efficacy regarding breastfeeding can be achieved, which will enhance the success of exclusive breastfeeding, which is also the primary goal of the WHO. until 2030 [5].

Author Contributions

F.A contributed to the implementation, design and writing of the manuscript. S.T the main professor supervisor. G.O contributed in writing the manuscript and translating the scale. K G allocation of pregnant women and design of research. VK contributed in the design of the research. P.N professor supervisor G.C Professor supervisor.

Conflict of Interest

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