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ORIGINAL PAPER

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Reliability and Validity of the Greek Version of the Iowa Infant Feeding Attitude Scale Among Pregnant Women

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ABSTRACT

Introduction: A modifiable factor related to breastfeeding is breastfeeding attitudes. The Iowa Infant Feeding Attitude Scale (IIFAS) is used to evaluate this factor. Although the breastfeeding rates in Greece are declined there is not available any validated instrument to evaluate infant feeding attitudes. **Aim:** to determine the psychometric properties of the Greek adaptation of the IIFAS in a sample of pregnant women. **Materials and Methods:** Pregnant women (N=203) from a University Hospital in Athens, Greece, were administered the Greek version of the IIFAS, while being in hospital, and their infant feeding mode at six months postpartum was recorded by telephone. The reliability of the scale was assessed by using corrected item-total correlations and Cronbach's alpha. Construct validity of the scale was assessed by using confirmatory factor analysis and predictive validity by using t-tests. Multiple linear regression analyses in a stepwise method (p for removal was set at 0.1 and p for entry was set at .05) was performed in order to find variables independently associated with IIFAS total score. **Results:** The mean IIFAS score was 70.0 (SD=7.6). The corrected item-total correlation ranged from 0.22 to 0.51. Cronbach's alpha was equal to 0.71. The confirmatory factor analysis indicated an adequate fit of the one-factor model. Concerning the predictive validity of IIFAS it was significant for breastfeeding at six months. The mean IIFAS score was significantly greater (p=0.001) for women that had exclusive breastfeeding at six months (mean (SD): 68.4(6.6)) as compared with those that did not (mean (SD): 64.0(7.5)). Higher IIFAS scores were found in older women, with higher educational level and in those that had breastfed children in their social environ-

ment. **Conclusion:** The Greek version of the IIFAS demonstrated satisfying reliability and validity for measuring women's infant feeding attitudes in the Greek context. Also, the results of the present study provide further evidence of the international applicability of the IIFAS.

Keywords: Breastfeeding attitudes, exclusive, Iowa Infant Feeding Attitude Scale, reliability, validity.

1. 1. INTRODUCTION

Breastfeeding is recommended to be exclusive from birth to six months and then to be continued with adequate complementary feeding for more than two years (1). The World Health Organization (2) has set a global nutrition target, that in 2025 at least 50% of infants should be exclusively breastfeeding at 6 months.

Although the benefits of breastfeeding are fully cited (3-5), developed countries keep on witnessing low breastfeeding rates (6). In Greece, the initiation rates of breastfeeding range from 87-92% (7-9) and exclusive breastfeeding rates at 6 months decline to 0,8-24,5% (7, 9). These data demonstrate the need to evaluate and improve breastfeeding rates in Greece further, especially by increasing exclusive breastfeeding rates and duration of breastfeeding.

Factors related to continued breastfeeding can be categorized into a) socio-demographic factors such as age, marital status, and social support; b) biomedical factors such as nipple pain, insufficient milk; and c) psycho-social factors such as breastfeeding attitude and self-efficacy (10). The psycho-social factors are especially important to clinical practice because

they are modifiable factors. This study focuses on the modifiable variable of women's attitudes toward breastfeeding, as breastfeeding attitudes are a predictive factor of the feeding mode and are associated with longer duration of breastfeeding (11-15).

Mora et al. (16) developed a simple, easy to administer and score instrument, called the Iowa Infant Feeding Attitudes Scale (IIFAS) that measures maternal attitudes toward different methods of infant feeding and predicts breastfeeding intention.

The IIFAS has been used in many countries such as USA (16), Canada (17-18), Hawaii (19), Australia (20), Japan (21), China (22), India (23), Romania (24), Scotland (25), UK (26) and Saudi Arabia (27). This scale has been used by various populations like antenatal and postnatal women (28-29) and has also been used as a tool to evaluate breastfeeding education programmes (30-32) and to predict the initiation and duration of breastfeeding (33). In Greece there are no translated and validated instruments to measure maternal breastfeeding attitudes. Bearing in mind the extremely low rates of exclusive breastfeeding at six months in Greece, the use of IIFAS is mostly important.

2. AIM

Therefore, the aim of this study was to determine the reliability and validity of the Greek adaptation of the IIFAS in a sample of pregnant women. The availability of this version of IIFAS is required for researchers and clinicians in order to measure breastfeeding attitudes, identify high-risk mothers to cease breastfeeding prematurely and design or evaluate breastfeeding education programs that can have a positive impact on the low breastfeeding rates in Greece.

3. MATERIALS AND METHODS

The present study was conducted in the Outpatient Maternity Department of a large, public maternity hospital in Athens, Greece. Participants were pregnant women who received routine care at the outpatient maternity department of the hospital, between May 2016 and January 2017. Women were included in the sample if they: a) were able to understand the Greek language so that they could fill in the questionnaires, b) were above 18 years old, and c) were more than 32 weeks pregnant. A member of the research team contacted the eligible women, informed them about the aims and the protocol of the study and gave them two envelopes containing the questionnaires and the informed consent. The latter was obtained from all participants prior to inclusion in the study. An assurance was given about their right to withdraw with no compromise to the standard of care they received. Confidentiality was also assured.

During the recruitment period 243 eligible women were invited to participate and finally, 203 agreed (response rate 83%). All participants were administered the IIFAS (16) and a questionnaire which was developed to collect baseline socio-demographic data regarding their age, BMI, nationality, educational level, household income, and family status. In addition, women's reproductive history was self-reported including antenatal complications and smoking status. Breastfeeding status was obtained by telephone at 6 months postpartum to demonstrate duration and exclusiv-

ity of breastfeeding. This study was conducted according to the ethical guidelines of the Declaration of Helsinki (37) and was approved by the Research and Ethics Committee of the Greek maternity hospital (6/20-04-2016) and of a Greek University which supervises the main study as well (21/29-10-2015).

3.1. Instrument

The IIFAS provides a reliable and valid assessment of attitudes toward different methods of infant feeding and is found to have high internal reliability (Cronbach's $\alpha = 0.86$) and to be predictive of breastfeeding intention and initiation in expectant and postpartum women and breastfeeding duration among breastfeeding mothers (16). According to Twells et al. (18), this tool could be used to identify mothers who are likely to breastfeed, to assess changes in attitudes over time and to evaluate health promotion programs. The scale consists of 17 items rated on 5-point Likert-type scales (1 = strongly disagree to 5 = strongly agree). Eight of the items are formulated favorable regarding breastfeeding, while the remaining 9 are favorable regarding formula feeding and hence are reverse-scored. Total attitude scores range from 17 to 85 with higher scores reflecting attitudes more positive to breastfeeding (16). In a review of instruments that measured breastfeeding attitudes and knowledge, it has been stated that IIFAS has been used 27 times in original and adjusted formats (34).

3.2. Instrument translation

Permission to use and translate the questionnaire was given to the researchers by their developers (16). The IIFAS used in this study was translated into Greek from the original questionnaire using international guidelines (35-36) and the internationally accepted translation method (i.e. the standard linguistic validation process). Conceptual analysis of the original instrument's items was performed for the standard linguistic validation process. Two professional translators, native speakers of the Greek language and fluent in the English language undertook independent forward translations into the target language. As soon as a reconciled version of the instrument was developed, a professional translator performed a backward translation of this reconciled version back into the original language. The back-translation and the original one were compared and any differentiation between them led to changes to the reconciled translation in the Greek language. This latest version was reviewed by the researchers participating in the research study. The final Greek version was produced after the feedback of the researchers. The same grouping and order of the items and the categories of the Greek translation of IIFAS were followed, as in the original English version.

3.3. Statistical analysis

Continuous variables are presented with the mean and standard deviation (SD). Qualitative variables are presented with absolute and relative frequencies. A confirmatory factor analysis (CFA) using the maximum likelihood procedure was conducted in order to examine how well the IIFAS model fits the data. The variance of the latent constructs was fixed at one during parameter estimation. The fit of the CFA model was assessed using the comparative fit index (CFI), the goodness of fit index (GFI) and the root mean square error of approximation (RMSEA) (38). For the CFI and GFI indices,

values close to or greater than 0.95 are taken to reflect a good fit to the data (39). RMSEA values of less than 0.05 indicate a good fit and values as high as 0.08 indicate a reasonable fit (39). The internal consistency of the questionnaire was analyzed with Cronbach’s α . Reliability equal to or greater than 0.70 was considered acceptable. Additionally, attitude toward breastfeeding was separated into 5 categories as follows: strongly positive toward formula feeding (total score: 17-52), positive toward formula feeding (total score: 53-59), neutral (total score: 60-75), positive toward breastfeeding (total score: 76-82), and strongly positive toward breastfeeding (total score: 83-85) (27). Predictive validity was assessed with the comparison of IIFAS total score using Student’s t-test between women that had exclusive breastfeeding at 6 months postpartum and those that did not. Multiple linear regression analyses in a stepwise method (p for removal was set at 0.1 and p for entry was set at .05) was performed in order to find variables independently associated with IIFAS total score. Regressions coefficients with their standard errors were computed from the results of the regression analyses. P values reported are two-tailed. The statistical significant level was set at .05 and analysis was conducted using SPSS and AMOS (SPSS, Chicago, IL, USA) Statistical Software.

	N (%)
Age, mean (SD)	32.4 (4.7)
BMI (before pregnancy), mean (SD)	22.5 (3.9)
Nationality	
Greek	190 (93.6)
Other	13 (6.4)
Educational level	
Primary/ Middle/ High school	62 (30.5)
University	86 (42.4)
Postgraduate studies	55 (27.1)
Monthly family income	
<800 euro	37 (22.0)
800-1500 euro	70 (41.7)
>1500 euro	61 (36.3)
Family status	
Married/ Living with partner	183 (90.1)
Single/ Divorced	20 (9.9)
Relationship with partner/husband	
Very bad/ Bad/ Moderate	15 (7.6)
Good	17 (8.6)
Very good	166 (83.8)
Have any breastfed children in their social environment	53 (26.2)
If yes, are they breastfed for more than 3 months?	50 (94.3)
Gestational week, mean (SD)	35.7 (3.2)
Medical problems during pregnancy	77 (43.5)
Smoking before pregnancy	74 (37.0)

Table 1. Sample characteristics

Item	Mean	SD	Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	2.0	1.3	0.31	0.72
2	2.4	1.4	0.31	0.71
3	4.8	0.7	0.32	0.70
4	2.2	1.0	0.36	0.71
5	3.4	1.1	0.22	0.70
6	2.4	1.1	0.30	0.72
7	3.9	1.1	0.39	0.69
8	1.8	1.1	0.35	0.68
9	3.8	1.0	0.32	0.68
10	2.2	1.0	0.37	0.71
11	2.1	0.9	0.30	0.69
12	4.7	0.7	0.47	0.69
13	4.4	0.8	0.51	0.69
14	2.2	1.0	0.37	0.71
15	3.9	1.1	0.33	0.72
16	4.6	0.7	0.36	0.71
17	3.2	1.2	0.39	0.70

Table 2. Inter-item correlation coefficients and internal consistency reliability of the IIFAS questionnaire

	b	SE	P
Maternal age, (years)	0.28	0.11	0.017
Educational level			
Primary/ Middle/ High school	reference		
University/ Postgraduate studies	2.63	1.17	0.026
Have any breastfed children in their social environment			
No	reference		
Yes	3.23	1.16	0.006

Table 3. Multiple linear regression results: regression coefficients (b) and SE values

4. RESULTS

4.1. Sample description

Participants were 203 women with mean age 32.4 years (SD = 4.7 years). Sample characteristics are presented in Table 1. 90.1% of the participants were married or lived with a partner. University degree had 42.4% of the participants while 27.1% had postgraduate degrees. The majority of the sample were Greek (93.6%) and the mean gestational week was 35.7 (SD=3.2). 43.5% of the women experienced problems during pregnancy and 37% were smokers before pregnancy. 26.2% of them had breastfed children in their social environment.

4.2. Internal Consistency

Descriptive statistics for the IIFAS items, corrected item-total correlations, and Cronbach’s alpha, if an item was deleted, are presented in Table 2. The higher mean values were found for the items 3, 12, 13 and 16. Internal consistency reliability for the IIFAS was accepted with Cronbach’s alpha equal to 0.71. The mean IIFAS score was 70.0 (SD=7.6). The participants’ overall IIFAS scores ranged between 41 and 85. The majority (74.3%) had a neutral attitude toward breastfeeding, 11.2% were positive toward formula feeding and only 2.2% of participants were strongly positive toward

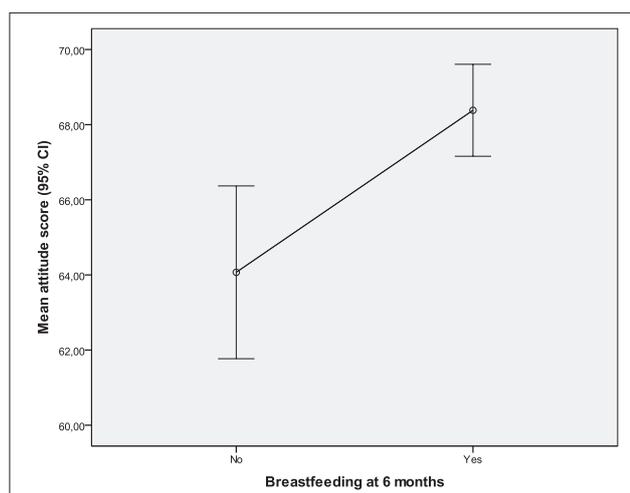


Figure 1. Mean IIFAS score for women that had exclusive breastfeeding at six months and that did not.

formula feeding. Furthermore, 12.3% were positive toward breastfeeding.

4.3. Construct Validity

A CFA was conducted to estimate if the model fitted the data well. The CFA indicated an adequate fit of the one-factor model (RMSEA=0.076, CFI=0.958 and GFI=0.949). None of the item cross-loadings exceeded the item loadings on the intended latent construct.

4.4. Predictive Validity

Concerning the predictive validity of IIFAS, it was significant for breastfeeding at six months. The mean IIFAS score was significantly greater ($p=0.001$) for women that had exclusive breastfeeding at six months (mean (SD): 68.4(6.6)) as compared with those that did not (mean (SD): 64.0(7.5)) (Figure 1).

4.5. Correlation with other characteristics

When multiple regression analysis was performed in a stepwise method, it was found that maternal age and educational level were independently associated with IIFAS score (Table 3). Specifically, greater scores were found in women with higher educational level and in those that already had breastfed children in their social environment. Additionally, the score on IIFAS was found to be increased as the age of the mother increases.

5. DISCUSSION

This is the first study to report on the use of the IIFAS in the Greek context. These data provide evidence about the reliability and validity of the Greek version of IIFAS.

The translation procedure of IIFAS was based on international guidelines to achieve equivalence.

Its internal consistency reliability was accepted with Cronbach's alpha equal to 0.71. Accordingly, in other studies carried out also during pregnancy, the Cronbach's alpha value ranged between 0.66 (21) and 0.72 (40). All items had good corrected item-total correlations (0.22-0.51). The item 17 (mother drinking alcohol), that was reported to have low correlation coefficients in Japanese, Chinese and Arabic versions (21, 22, 27), showed a good corrected item - total correlation in the present study. This could be explained by the fact that in the Greek cultural and religious context, drinking alcohol occasionally is considered acceptable.

Thus, item 17 is applicable to Greek women.

As far as it concerns construct validity, the one-factor model was confirmed. The predictive validity of the IIFAS-GR was adequately reported, as it was also in previous studies (21, 27, 41). Higher IIFAS-GR scores during pregnancy predicted exclusive breastfeeding at 6 months, compared with other studies that predicted breastfeeding at 4 weeks (21), at 3 months (41) or intent at 6 weeks postpartum (24). Thus, the IIFAS-GR is a valid tool for predicting breastfeeding duration and exclusivity at 6 months postpartum and identifying high-risk women for stopping breastfeeding prematurely.

The majority of the women (74.3%) had a neutral attitude towards breastfeeding and 12.3% had a positive attitude, which is consistent with a previous study (27). In the present study, higher scores were found in older women, with higher educational level and in those that already had breastfed children in their social environment. Positive association of IIFAS scores with educational level is also confirmed in previous studies (16, 26, 42). Moreover, maternal age is positively associated with IIFAS scores also in the Romanian (24) and the Arabic (27) version. This may be due to the fact that older and more educated women are expected to be more knowledgeable and receptive than the others. Also, having breastfed children in the social environment influences breastfeeding attitudes. Success of breastfeeding by friends seems to influence and encourage women to breastfeed (43). Also, this is the first study that included participants with self-reported medical problems during pregnancy, in almost half of the total number (43.5%). These findings indicate the need to develop, implement and evaluate breastfeeding educational programmes for younger, low-educated women. Also, further research should be conducted to women with high-risk pregnancies.

This study was not without limitations. The participants were recruited from only one public maternity hospital in the city of Athens. The sample, therefore, might not be representative of all Greek pregnant women, thus limiting its generalizability. However, this hospital serves pregnant women not only from the area of Athens but also from rural areas of Greece, with diverse cultural background and economic status.

6. CONCLUSION

This appears to be the first infant feeding attitude study using a Greek version of IIFAS. The Greek version of IIFAS is a robust, easy to administer, valid and reliable scale for measuring maternal infant feeding attitudes during pregnancy and predicting infant feeding mode at six months postpartum. Thus, it can also be used for the identification of women at risk for stopping breastfeeding prematurely and for the development of adequate interventions to promote breastfeeding in the Greek context that presents low breastfeeding rates. Also, the results of the present study provide further evidence of the international applicability of the IIFAS.

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