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Vardavaki, Z., Hollins Martin, C.J., Martin, C. (2015). Factor structure, validity and reliability of the Greek translation Birth Satisfaction Scale (G-BSS). *Journal of Reproductive and Infant Psychology*. 33(5): 488-503. DOI: 10.1080/02646838.2015.1035235

### Abstract

**Background:** Birth Satisfaction' is a term that encompasses a woman's evaluation of her birth experience. The term includes factors such as her appraisal of the quality of care she received, a personal assessment of how she coped, and her reconstructions of what happened on that particular day. Her accounts may be accurate or skewed, yet correspond with her reality of how events unfolded.

**Objective:** To evaluate properties of an instrument designed to measure birth satisfaction in a Greek population of postnatal women.

**Study design:** We assessed factor structure, internal consistency, divergent validity and known-groups discriminant validity of the *30-item-Greek-Birth-Satisfaction-Scale-Long-Form (30-item-G-BSS-LF)* and its revised version the *10-item-Greek-BSS-Revised (10-item-G-BSS-R)*, using survey data collected in Athens.

**Participants:** A convenience sample of healthy Greek postnatal women (n=162) aged 22-46 years who had delivered between 34-42 weeks gestation.

**Results:** The short-form *10-item-G-BSS-R* performed well in terms of measurement replication of the English equivalent version. Both versions are similarly comprised of 3 sub-scales which measure distinct but correlated domains of: (1) *quality of care provision* (4-items), (2) *women's personal attributes* (2-items), and (3) *stress experienced during labour* (4-items).

**Key conclusions:**

The *10-item-G-BSS-R* is a valid and reliable multi-dimensional psychometric instrument for measuring birth satisfaction in Greek postnatal women.

**Key Words:** Birth Satisfaction Scale (BSS), childbearing women, Greek, intranatal, labour, psychometric properties

## Introduction

The focus of this investigation was to determine the uni-dimensional versus multi-dimensional structural configuration of the Greek translated *30-item-Greek-Birth-Satisfaction-Scale-Long-Form (30-item-G-BSS-LF)* and its revised version the *10-item-Greek-BSS-Revised (10-item-G-BSS-R)*. The properties evaluated included factor structure, internal consistency, divergent validity and known-groups discriminant validity. This paper outlines the processes involved and its outcomes.

Birth satisfaction represents a woman's subjective and uniquely personal evaluation of her birth experience. This complex multi-faceted construct includes elements of perceived quality of care, coping efficacy and reflections of the birth experience as a whole and in context. Birth satisfaction is thus a retrospective reconstruction related directly to the salient events surrounding the experience of birth (Hollins Martin and Fleming, 2011).

When a midwife assesses birth satisfaction, evaluations can only be considered good quality when reports are articulated as such. Whether reports are good or bad, every woman's evaluation of her experience is important.

Hollins Martin and Fleming (2011) developed the original English *30-item-Birth-Satisfaction-Scale-Long-Form (30-item-BSS-LF)*, through transcribing evidence-based reports of women's birth satisfaction into statements written in English. Three main areas (sub-scales) that affect 'birth satisfaction' were identified in the literature:

(1) *Quality of Care (QC)* (includes sub-themes (1a) *home assessment*, (1b) *birth environment*, (1c) *sufficient support*, and (1d) *relationships with health professionals*).

(2) *Women's Attributes (WA)* (includes sub-themes (2a) *ability to cope in labour*, (2b) *feeling in control*, (2c) *preparation for childbirth*, and (2d) *relationship with baby*).

(3) *Stress Experienced (SE)* (includes sub-scales (3a) *distress during labour*, (3b) *obstetric injuries*, (3c) *perception of sufficient medical care*, (3d) *obstetric intervention*, (3e) *pain experienced*, (3f) *long labour*, and (3g) *health of baby*).

A second qualitative assessment of scale content took place using a research method called *Concurrent Analysis* (Hollins Martin et al., 2012).

The next step was to conduct a quantitative survey specifically to test validity and reliability of the statements on the *30-item-BSS-LF*. Participants were women (n=228) less than 10 days postpartum who resided in the West of Scotland (UK). Post analysis, the *30-item-BSS-LF* was reconfigured into the *10-item-Birth-Satisfaction-Scale-Revised (10-item-BSS-R)* (see Hollins Martin & Martin, 2014). The *10-item-BSS-R* is comprised of 3 sub-scales that measure distinct but correlated domains of: (1) *Quality of Care(QC)* (4-items), (2) *Women's Attributes (WA)* (2-items), and (3) *Stress Experienced (SE)* (4-items).

Simultaneously, the *30-item-BSS-LF* was made available to a Greek midwife (first author) to conduct a survey in Athens. The objective was to evaluate the properties of a Greek translated version of the instrument (the *30-item-G-BSS-LF* and its embedded *10-item-G-BSS-R*), and assess factor structure, internal consistency, divergent validity, known-groups discriminant validity, and determine the uni-dimensional versus multi-dimensional structural configuration. Also, to evaluate the approaches taken by Hollins Martin and Fleming (2011) in the development of the *30-item-BSS-LF*, and the work of Hollins Martin et al. (2012) in application of concurrent analysis as a verification technique to support the veracity of the

underlying themes that support construction of the measure. The properties of the *30-item-G-BSS-LF* evaluated, included factor structure, internal consistency, divergent validity and known-groups discriminant validity. The following research questions were asked:

- (1) Is the *30-item-G-BSS-LF* a uni-dimensional or multidimensional measure?
- (2) Are the thematically embedded and postulated sub-scales of the *30-item-G-BSS-LF* robust and reliable?
- (3) Does the *30-item-G-BSS-LF* and any inherent sub-scales demonstrate acceptable internal consistency and divergent validity?
- (4) Is the known-groups discriminant validity of the *30-item-G-BSS-LF* satisfactory?
- (5) Is the *30-item-G-BSS-LF* the most appropriate and psychometrically valid formulation of the tool?
- (6) Is the shortened version of the *30-item-G-BSS-LF* (the *10-item-G-BSS-Revised*), the same as the *10-item-BSS-Revised* (BSS-R) based on UK (Scottish) data?

## **Method**

A quantitative survey was carried out using the *30-item-G-BSS-LF*. As a function of completing the *30-item-G-BSS-LF* participants also completed the short-form *10-item-G-BSS-R*. Using a quantitative design, this study focuses on evaluating the key psychometric properties of the *30-item-G-BSS-LF*, which included a sequential optimisation of the instrument. This study follows a sequential process of instrument evaluation using classical and contemporary psychometric approaches (Byrne, 2010; Kline, 2000) applied to a single cohort that is differentiated by clinical attributes and allows evaluation of instrument measurement properties.

### Ethical approval

Ethics approval was gained from the appropriate organisational structures within the maternity unit and from the Technological Education Institute of Athens (Greece).

### Participants

Participants were a convenience sample of healthy Greek postnatal women (n=162) aged 22-46 years (Mean=32; SD=4.75), who had delivered between 34-42 weeks gestation at a maternity unit in Athens. Those who had experienced a stillbirth, perinatal or neonatal death were excluded from taking part due to the impact grief has upon constructions of childbirth (Hollins-Martin & Forrester, 2013).

### Translation of the 30-item-BSS-LF into Greek

The scale was translated into Greek by two native Greek midwives, both of whom were fluent in oral and written English. The first author has lived in England for several years. Post translation, a pilot study was carried out with 5 Greek service users to test comprehension and interpretation of items. In response to feedback, minor adjustments were made and procedures repeated to further refine the *30-item-G-BSS-LF*.

### The 30-item-G-BSS-LF

Participants responded to statements on the *30-item-G-BSS-LF* by circling a 5-point Likert scale. The range of scores is 30-150, with a score of 30 representing least satisfied and 150 most satisfied. An example question follows:

(Q27) The staff communicated well with me during labour. Είχα καλή επικοινωνία με το προσωπικό καθ' όλη τη διάρκεια του τοκετού.					
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	
Συμφωνώ Απόλυτα	Συμφωνώ	Ούτε συμφωνώ Ούτε διαφωνώ	Διαφωνώ	Διαφωνώ Απόλυτα	
Scores	5	4	3	2	1
Comments(Σχόλια): _____					
_____					
_____					

To view full content of the *30-item-BSS-LF* see (Table 1).

TABLE 1. ABOUT HERE

### **Data collection**

Data was collected in 2012. Initially the *30-item-G-BSS-LF* was sent by email to interested participants, with (n=250) responding. Prior to completing the *30-item-G-BSS-LF*, an information sheet and consent form were sent by email, with opportunity provided to ask and have questions answered via email or telephone. The completed survey instrument (n=185; 75% return rate) was anonymously tagged and stored on a password protected computer. The high return rate was considered to have been achieved through Foot-In-The-Door (FITD) technique (Burger, 1999), which involves conscripting people through an initial first request followed by a second request to complete the survey.

## **Statistical analysis**

The objectives of the study in terms of the evaluation of the psychometric properties of the *30-item-G-BSS-LF* required the use of Confirmatory Factor Analysis (CFA) (Kline, 1993, 2000); CFA being a special case of the Structural Equation Modelling (SEM) approach to data analysis (Byrne, 2010; Kline, 1998). It should be noted that factor analysis (both EFA and SEM) are considered a part of the multiple general linear hypothesis set of procedures and consequently share many of the fundamental assumptions of associated statistical techniques. These parametric assumptions include multivariate normality and normal distribution, absence of outliers and interval level of measurement. The robustness of parametric tests against violations of the fundamental parametric assumptions (Martin & Thompson, 2000) have resulted in the contemporary use of ordinal or ordered categorical data, which represents the common reality of questionnaire data, with these statistical techniques (Friedrich et al., 2011; Kind & Barmby, 2011; Shulruf et al., 2004). However, data exhibiting significant deviation from the normal distribution assumption can lead to an erroneous outcome of a statistical analysis based on assumed parametric acceptable data distributional characteristic and consequently, an incorrect and potentially misleading interpretation of statistical findings (Flora & Curran, 2004; Lubke & Muthen, 2004; Martin & Thompson, 2000; Muthen & Kaplan, 1992). Consequently, each of the scale items distributional characteristics were examined in detail and evaluated to determine deviation from assumed normality that could have a deleterious impact on the CFA and SEM. Skew and kurtosis characteristics of each item were examined and those exhibiting any significant deviation from normality were rejected from the *30-item-G-BSS-LF* item pool prior to further statistical analysis based on normality assumptions. The criteria for item rejection was based on

univariate skew and kurtosis characteristics and absolute skew values equal to, or greater than 3 and absolute kurtosis values of equal to, or greater than 10, based on the non-normality cut-off recommendations of Kline (2005). Statistical analysis for all quantitative studies in this thesis were conducted using PASW version 18 (SPSS, 2009a,b), Analysis of Moment Structures (AMOS) version 18 (Arbuckle, 1995-2009) and Mplus version 3 (Muthen & Muthen, 1998-2004).

### **Confirmatory Factor Analysis (CFA)**

Evaluation of a measurement and structural model of a psychometric measure can be conducted using Structural Equation Modelling (SEM) and the special case of this approach, Confirmatory Factor Analysis (CFA). In total four CFA models will be evaluated, two multi-dimensional models and two uni-dimensional models. The multi-dimensional models represent three-factor models comprising three related thematically determined sub-scales of *Quality of Care (QC)*, *Women's Attributes (WA)*, and *Stress Experienced (SE)*, consistent with the themes identified in the original English language *30-item-BSS-LF* study by Hollins Martin and Fleming (2011). The two multi-dimensional models evaluated are the full 30-item version of the scale and the 10-item short-form version. The two uni-dimensional models evaluated represent single factor models of the full 30-item version of the BSS and the 10-item short-form version. A fundamental tenet of SEM is the pursuit of model fit and parsimony, with the model providing the best statistical fit to the data and most appropriate representation of the measurement model, the caveat being that model fit is statistically adequate. Consistent with the assumption of multivariate normality, a maximum-likelihood (ML) approach to model estimation was adopted (Byrne, 2010; Kline, 1993; 2000). Multiple goodness of fit tests (Bentler & Bonett, 1980) were used to evaluate the models, these being the Comparative Fit Index (CFI) (Bentler, 1990),

and the root mean squared error of approximation (RMSEA). A CFI greater than 0.90 indicates an acceptable fit to the data (Bentler & Bonett, 1980; Bollen, 1989; Hu & Bentler, 1995; Kline, 1998; Marsh et al, 1988), while a CFI equal to or greater than 0.95 indicates a good fit to the data (Hu & Bentler, 1999). A RMSEA with values of less than 0.08 indicate an acceptable fit to the data (Browne & Cudeck, 1993), while values of less than 0.05 indicate a good fit to the data (Schumaker & Lomax, 2010). A statistically significant  $\chi^2$  indicates a significant proportion of variance within the data is unexplained by the model (Bentler & Bonett, 1980), however trivial and inconsequential variations in the data can promote a significant  $\chi^2$  statistic (Hu & Bentler, 1995), hence model evaluation is almost universally determined by model fits statistics such as CFI and RMSEA (Byrne, 2010; Hooper et al., 2008).

### **Divergent validity**

Divergent validity was determined by correlating scale scores (30-item and 10-item versions) with the number of weeks pregnant when the baby was born. It was predicted that there would be no significant relationship between scores and the duration of pregnancy.

### **Known-groups discriminant validity**

Known-groups discriminant validity was evaluated by testing for differences in scores in relation to birth type, comparing normal delivery to non-normal (forceps, ventouse, prearranged section, emergency section). It was predicted that total scores would be significantly higher for normal compared to non-normal delivery. In relation to theoretically circumscribed sub-scales embedded within the instrument, it is anticipated that while there would be no significant difference in *quality of care* provision sub-scale scores, and *women's personal attributes* sub-scales scores as a

function of delivery type. However, it is predicted that scores on the *stress experienced during labour* sub-scale would be significantly higher, since higher scores relate to greater satisfaction within this domain, in the normal delivery type group.

### **Internal consistency**

An internal consistency analysis was conducted to ensure that the measures satisfied the criteria for clinical and research purposes using the Cronbach coefficient alpha statistical procedure. A Cronbach's alpha reliability statistic of 0.70 is considered as the minimum acceptable criterion of instrument internal reliability (Kline, 1993, 2000).

## **Results**

### **Descriptive results**

A total of 162 women completed the *30-item-G-BSS-LF*, with 116 (72%) of these participants primigravidas. The average duration of pregnancy was 39 (SD 1.31) weeks, and the average duration of labour was 6.81 (SD 5.43) hours. The total *30-item-G-BSS-LF* score was 112.57 (SD 16.62), and the thematically determined sub-scale mean scores of the *quality of care provision* (8-items), *women's personal attributes* (8-items), and *stress experienced during labour* (14-items) sub-scales were 30.67 (5.25), 29.60 (5.15) and 52.31 (8.52) respectively.

### **Multivariate normality**

The distribution of the *30-item-G-BSS-LF* items revealed no significant evidence of skew or kurtosis with the exception of item 6. '*I gave birth to a normal healthy baby*' (skew = 3.54; kurtosis = 12.72).

### **Measurement evaluation of predicted models**

The structure of the thematically derived 30-item three-factor model was found to be poor,  $\chi^2_{(df = 403)} = 1188.51$ ,  $p < 0.001$ , CFI = 0.55 and RMSEA = 0.11. The alternative 30-item single-factor model was also revealed to have a poor fit to the data,  $\chi^2_{(df = 406)} = 1209.93$ ,  $p < 0.001$ , CFI = 0.54 and RMSEA = 0.11. The 10-item single-factor model based on the *10-item-BSS-R* revealed a poor fit to the data,  $\chi^2_{(df = 35)} = 178.08$ ,  $p < 0.001$ , CFI = 0.66 and RMSEA = 0.16. The structure of the 10-item three-factor model based on Hollins Martin and Martin (2014) and the *10-item-G-BSS-R* was also found to be improved, with model fit approaching acceptability,  $\chi^2_{(df = 32)} = 76.20$ ,  $p < 0.001$ , CFI = 0.90 and RMSEA = 0.09. Application of the Satorra-Bentler scaled  $\chi^2$ , which controls for data distributional non-normality, improved fit of this model to acceptability  $\chi^2_{(df = 32)} = 64.77$ ,  $p < 0.001$ , CFI = 0.91 and RMSEA = 0.08. To view the 10-BSS items comprising three-factor best-fit measurement model and associated domains reported by Hollins Martin and Martin (2014) (see *Table 2*).

#### TABLE 2. ABOUT HERE

##### *Rescaling of the 10-item short-form version (10-item-G-BSS-R)*

Using the three-subscale model of the *10-item-BSS-R* and the suggested rescaling to a zero point as suggested by Hollins Martin and Martin (2014), the 10-item revised version of the *10-item-G-BSS-R* was rescaled to produce a zero score point across the total scale and the three subscales, thus the revised 10-item instrument would be scored along a 0-4 Likert scale instead of a 1-5 Likert scale. Using this approach the *10-item-G-BSS-R* total score was 27.45 (SD 6.22, range 6-40), and the thematically determined sub-scale mean scores of the *quality of care provision* (BSS-QC), *women's personal attributes* (BSS-WA), and *stress experienced during labour* (BSS-SL) sub-scales were 11.75 (SD 3.10, range 2-16), 5.21 (SD 1.94, range 0-8) and 10.49 (SD 2.99, range 1-16) respectively. All three sub-scales were observed to be

moderately to highly correlated and indeed, correlated with the full *30-item-G-BSS-LF* version and the associated thematically-derived sub-scales. The relationship between short-form and full-length total and sub-scales versions are shown in *Table 3*.

TABLE 3. ABOUT HERE

### **Divergent validity**

No significant correlation was observed between the *10-item-G-BSS-R* total score and the number of weeks of the pregnancy,  $r = 0.02$ ,  $p=0.84$ . Neither was there evidence of any significant relationships with the *10-item-G-BSS-R* short form sub-scale scores; between G-BSS-SL-SF scores, G-BSS-WA-SF scores, G-BSS-QC-SF and pregnancy duration,  $r = 0.02$ ,  $p = 0.82$ ;  $r = 0.08$ ,  $p = 0.31$ ;  $r = 0.01$ ,  $p = 0.99$ ; respectively. Similarly, no significant correlation was observed between the *30-item G-BSS-LF* total score and the number of weeks of the pregnancy,  $r = 0.03$ ,  $p=0.73$ . Neither was there evidence of any significant relationships with the *30-item-G-BSS-LF* sub-scale scores: between G-BSS-SL scores, G-BSS-WA scores, G-BSS-QC and pregnancy duration,  $r = 0.01$ ,  $p = 0.96$ ;  $r = 0.11$ ,  $p = 0.17$ ;  $r = 0.03$ ,  $p = 0.73$ ; respectively.

### **Known-groups discriminant validity**

The mean *10-item-G-BSS-R* total score and G-BSS-SL-R, G-BSS-WA-R and G-BSS-QC-R sub-scale scores as a function of delivery type are shown in *Table 4*.

TABLE 4. ABOUT HERE

A significant difference between groups differentiated by delivery type was observed on the *10-item-G-BSS-R* total score,  $t_{(160)} = 3.96$ ,  $p < 0.001$ , and *G-BSS-SE-R* sub-scale score,  $t_{(160)} = 2.23$ ,  $p = 0.03$  in the direction predicted. Against prediction, statistically significant differences were observed in *BSS-WA-R* sub-scale scores,

$t_{(160)} = 1.98, p = 0.05$ , and *BSS-QC-R* sub-scale scores,  $t_{(160)} = 4.51, p < 0.001$ , as a function of delivery type. Similarly, examination of the impact of delivery type on the *30-item-G-BSS-LF* derived scores revealed significant differences between groups on total score,  $t_{(160)} = 5.32, p < 0.001$ , and sub-scale score,  $t_{(160)} = 4.27, p < 0.001$  in the direction predicted. Consistent with short-form sub-scales scores and against prediction, statistically significant differences were observed in *G-BSS-WA-R* sub-scale scores,  $t_{(160)} = 4.91, p < 0.001$ , and *G-BSS-QC-R* sub-scale scores,  $t_{(160)} = 4.78, p < 0.001$ , as a function of delivery type. The mean scores as a function of delivery type are shown in *Table 4*.

### **Internal consistency**

Calculated Cronbach's alpha's of the *10-item-G-BSS-R* total scale (0.78) and subscales *G-BSS-SE-R* (0.76), *G-BSS-WA-R* (0.51), and *G-BSS-QC-R* (0.56).

Cronbach's alpha of full scale derived scores for the *30-item-G-BSS-LF* total scale (0.75) and subscales *G-BSS-SE-LF* (0.89), *G-BSS-WA-LF* (0.80), and *G-BSS-QC-LF* (0.67).

## Discussion

The findings from this study are generally consistent with that of the Hollins Martin and Martin (2014) paper, which demonstrates support for the robustness of the *10-item-BSS-R* in terms of factor structure in the English version of the instrument. With similarity, our 30-item Greek version performed badly in terms of model fit, again, a finding consistent with Hollins Martin and Martin (2014). Our findings were also consistent with Hollins Martin and Martin (2014) in relation to known-groups discriminant validity findings, where those differentiated by having a normal birth scored significantly higher on all items of the *30-item-G-BSS-LF* and *10-item-G-BSS-R* sub-scales. It was originally predicted that there would be no difference in scores as a function of birth type on *Quality of Care (QC)* and *Women's Attributes (WA)* sub-scales, however statistically significant higher scores were found in the normal birth group.

It may be that our original predictions were actually in error, since these sub-scales represent domains of birth satisfaction and the self-perception and self-evaluation of these attributes may well be influenced by a non-normal birth experience. Indeed, it is clear from the Hollins Martin and Martin (2014) paper that the profile of scores on the *10-item-BSS-R* sub-scales and total score was identical in interpretation to what was found in the current study. Consequently, it is plausible that the *G-BSS-R-QC* and *G-BSS-R-WA* sub-scales are sensitive to germane contextual aspects of the birth experience rather than being representative of absolute quality of care or trait-specific aspects of women's individual attributes.

The lack of support for a uni-dimensional model of either the *30-item-G-BSS-LF* or the *10-item-G-BSS-R* is again consistent with Hollins Martin and Martin's (2014) critique of earlier work on the original development of the English (UK) version

of the scale, which suggested scoring the tool as a uni-dimensional measure with a single sum score (Hollins Martin & Fleming, 2011). However, it should be acknowledged that within the early development of the scale, Hollins Martin and Fleming (2011) had identified a plausible thematic structure that they recommended for further evaluation in terms of possible sub-scale differentiation. Our findings regarding poor model fit of the *30-item-G-BSS-LF* do however contradict the assertion of Hollins Martin et al. (2012) that the *30-item-BSS-LF* could be promoted as a fundamentally robust measure of birth satisfaction under the rubric that the instrument accounted for all the analysed data. This contradiction between findings of the *Concurrent Analysis* paper (Hollins Martin et al., 2012) and the psychometric paper (Hollins Martin & Martin, 2014) was also highlighted by Hollins Martin and Martin (2014). Consequently and consistent with Hollins Martin and Martin (2014), our findings would suggest that there may be tautological issues inherent within the *Concurrent Analysis* methodology used by Hollins Martin et al. (2012).

The short-form *10-item-G-BSS-R* (Greek version) performed well in terms of measurement replication of the *10-item-BSS-R* (English version) in our Greek sample. The one concern raised with respect to this short version of the tool, is the internal consistency estimations. The total score and *Quality of Care* (QC) subscale scores reached satisfactory consistency. However, the *Stress Experienced* (SE) and *Women's Attributes* (WA) subscales did not reach threshold levels of acceptable consistency. It is established that alpha levels are influenced by the number of items in the scale, therefore, with just two items it is unsurprising that the *10-item-G-BSS-R-WA* sub-scale performed sub-optimally. Hence, it is surprising that the *4-item-G-BSS-R-SE* did not perform well, particularly in comparison with the findings of Hollins Martin and Martin (2014), where this sub-scale revealed satisfactory internal

consistency properties. It may be that less than exemplary internal consistency characteristics of this particular sub-scale may have been influenced by the translation process and deleteriously impacted on this measurement index. It is suggested that further work be conducted to look at any impact of the translation process on this sub-scale in future use of the *10-item-G-BSS-R*, and also to consider whether additional items may be required for the *10-item-G-BSS-R-WA* sub-scale to improve its internal consistency.

## **Conclusion**

The *30-item-G-BSS-LF* and *10-item-G-BSS-R* and all their associated sub-scales were shown to have excellent divergent validity characteristics, suggesting that in the domain evaluated, that the instrument can be used reliably and is not influenced by key perinatal characteristics, such as length of pregnancy. Further evaluation of the divergent validity characteristics in other aspects of postnatal application of the tool would appear worthy of evaluation to define further the parameters of instrument use. Data has shown that the validated *10-item-G-BSS-R* is a robust instrument for midwives, obstetricians and maternity care managers to use to measure Greek speaking women's levels of birth satisfaction (see Appendix 1.). Also, in terms of impact there is potential to correlate results with other valid and reliable measures, such as locus of control and self-efficacy scales. Such future findings will help develop the evidence-base that underpins midwifery practice in Greek populations of women.

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**Table 1:** The statements that comprise the *30-item-Birth-Satisfaction-Scale-Long Form (30-item-BSS-LF)*

- (Q1) I coped well during my birth.
- (Q2) The delivery room staff encouraged me to make decisions about how I wanted my birth to progress.
- (Q3) I was well prepared for my labour, i.e., read a lot of literature and/or attended parenthood education classes.
- (Q4) I found giving birth a distressing experience.
- (Q5) I came through childbirth virtually unscathed.
- (Q6) I gave birth to a healthy normal baby.
- (Q7) During labour I received outstanding medical care.
- (Q8) I received a lot of medical intervention, i.e., induction, forceps, section etc.
- (Q9) I had a swift and speedy labour.
- (Q10) I felt well supported by my partner during labour and birth.
- (Q11) I was encouraged to hold my baby for a substantial amount of time after birth.
- (Q12) My birth experience was considerably different to what I intended.
- (Q13) I had the same midwife throughout the entire process of labour and delivery.
- (Q14) I felt that the delivery room was unthreatening and comfortable.
- (Q15) I felt very anxious during my labour and birth.
- (Q16) I felt out of control during my birth experience.
- (Q17) I felt it was better not to know in advance about the processes of giving birth.
- (Q18) I was not distressed at all during labour.
- (Q19) I felt mutilated by my birth experience.
- (Q20) My baby was avoidably hurt during birth.
- (Q21) The staff provided me with insufficient medical care during my birth.
- (Q22) I had a natural labour, i.e., minimal medical intervention.
- (Q23) I thought my labour was excessively long.
- (Q24) I felt well supported by staff during my labour and birth.
- (Q25) I was separated from my baby for a considerable period of time after my birth.
- (Q26) My birth proceeded as I planned it.
- (Q27) The staff communicated well with me during labour.
- (Q28) The delivery room was clean and hygienic.
- (Q29) Giving birth was incredibly painful.
- (Q30) Labour was not as painful as I imagined.

**Table 2.** The ten BSS items comprising three-factor best-fit measurement model and associated domains reported by Hollins Martin and Martin (2014) (note: Original item number from the 30-item BSS in parentheses).

Item	Question	Domain
1	(5) I came through childbirth virtually unscathed.	SE
2	(23) I thought my labour was excessively long.	SE
3	(2) The delivery room staff encouraged me to make decisions about how I wanted my birth to progress.	QC
4	(15) I felt very anxious during my labour and birth.	WA
5	(24) I felt well supported by staff during my labour and birth.	QC
6	(27) The staff communicated well with me during labour.	QC
7	(4) I found giving birth a distressing experience.	SE
8	(16) I felt out of control during my birth experience.	WA
9	(18) I was not distressed at all during labour.	SE
10	(28) The delivery room was clean and hygienic.	QC

Stress Experienced = SE; Quality of Care = QC; Women's Attributes = WA

**Table 3.** Correlations between the *10-item-G-BSS-R* total and sub-scale scores and the full *30-item-G-BSS-LF* total\* and sub-scale\* scores (all correlations statistically significant at  $p < 0.01$ )

Scale	G-BBC-R(total)	G-BSS-SE	G-BBS-WA	G-BSS-QC	G-BSS*	G-BSS-SE*	G-BBS-WA*	G-BSS-QC*
G-BSS-R(total)		0.85	0.69	0.75	0.92	0.85	0.78	0.76
G-BSS-SE			0.57	0.39	0.79	0.86	0.57	0.56
G-BSS-WA				0.21	0.52	0.48	0.61	0.28
G-BSS-QC					0.75	0.58	0.63	0.80
G-BSS*						0.93	0.82	0.86
G-BSS-SE*							0.63	0.70
G-BSS-WA*								0.59
G-BSS-QC*								

G-BSS-R=10-item-Greek-Birth-Satisfaction-Scale-Revised

G-BSS-SE=10-item-Greek-Birth-Satisfaction-Scale-Revised (SE=Stress Experienced)

G-BSS-WA=10-item-Greek-Birth-Satisfaction-Scale-Revised (WA=Women's Attributes)

G-BSS-QC=10-item-Greek-Birth-Satisfaction-Scale-Revised (QC=Quality of Care)

G-BSS\*=30-item-Greek-Birth-Satisfaction-Long-Form

G-BSS-SE\*=30-item-Greek-Birth-Satisfaction-Long-Form (SE=Stress Experienced)

G-BSS-WA\*=30-item-Greek-Birth-Satisfaction-Long-Form (WA=Women's Attributes)

G-BSS-QC\*=30-item-Greek-Birth-Satisfaction-Long-Form (QC=Quality of Care)

**Table 4.** Mean *10-item-G-BSS-R* and *30-item-G-BSS-LF* sub-scale scores as a function of delivery type (standard deviations in parentheses).

Variable	Normal Delivery (n=140)	Non-normal delivery (n=22)
10-item-G-BSS-R total	28.19 (5.90)	22.77 (6.34)
10-item-G-BSS-R-Stress Experienced	10.69 (2.94)	9.18 (3.05)
10-item- G-BSS-R-Woman's Attributes	5.33 (1.97)	4.45 (1.56)
10-item-G-BSS-R-Quality of Care	12.16 (2.84)	9.14 (3.47)
30-item-G-BSS total	115.12 (14.71)	96.36 (19.16)
30-item-G-BSS-Stress Experience	53.39 (7.79)	45.45 (9.91)
30-item-G-BSS-Women's Attributes	30.34 (4.88)	24.91 (4.41)
30-item-G-BSS-Quality of Care	31.40 (4.58)	26.00 (6.82)

Subscale (1) Quality of Care = home assessment, birth environment, sufficient support, relationships with health professionals;  
 Subscale (2) Women's Attributes = ability to cope in labour, feeling in control, preparation for childbirth, relationship with baby;  
 Subscale (3) Stress Experienced = distress during labour, obstetric injuries, perception of sufficient medical care, obstetric intervention, pain experienced, long labour, health of baby

**Appendix 1:** Valid and reliable 10-item-Greek Birth Satisfaction-Scale-Revised (10-item-G-BSS-R)

Strongly Agree (Συμφωνώ Απόλυτα) = (SA); Agree (Συμφωνώ) = (A); Neither Agree or Disagree (Ούτε συμφωνώ Ούτε διαφωνώ) = (NA/D), Disagree (Διαφωνώ) = (D), Strongly Disagree (Διαφωνώ Απόλυτα) = (SD)

(1) I came through childbirth virtually unscathed (Μέσα από τον τοκετό βγήκα σχεδόν αλώβητη).

	SA	A	NA/D	D	SD
Scores	4	3	2	1	0
Comments (Σχόλια):					

(2) I thought my labour was excessively long (Νομίζω ότι ο τοκετός μου κράτησε υπερβολικά πολύ ώρα).

	SA	A	NA/D	D	SD
Scores	0	1	2	3	4
Comments (Σχόλια):					

(3) The delivery room staff encouraged me to make decisions about how I wanted my birth to progress (Το προσωπικό στην αίθουσα τοκετού με ενθάρρυνε να παίρνω μόνη μου τις αποφάσεις για το πώς επιθυμώ να εξελιχθεί το τοκετός).

	SA	A	NA/D	D	SD
Scores	4	3	2	1	0
Comments (Σχόλια):					

(4) I felt very anxious during my labour and birth (Ένιωθα πολύ αγχωμένη κατά την διάρκεια του τοκετού).

	SA	A	NA/D	D	SD
Scores	0	1	2	3	4
Comments (Σχόλια):					

(5) I felt well supported by staff during my labour and birth (Αισθανόμουν ότι το προσωπικό με στήριξε κατά τη διάρκεια του τοκετού και της γέννας).

	SA	A	NA/D	D	SD
Scores	4	3	2	1	0
Comments (Σχόλια):					

(6) The staff communicated well with me during labour (Είχα καλή επικοινωνία με το προσωπικό καθ' όλη τη διάρκεια του τοκετού).

	SA	A	NA/D	D	SD
Scores	4	3	2	1	0
Comments (Σχόλια):					

(7) I found giving birth a distressing experience (Βρήκα την διαδικασία του τοκετού ως μια οδυνηρή εμπειρία).

	SA	A	NA/D	D	SD
Scores	0	1	2	3	4
Comments (Σχόλια):					

(8) I felt out of control during my birth experience (Αισθανόμουν ότι ήμουν εκτός ελέγχου κατά τον τοκετό).

	SA	A	NA/D	D	SD
Scores	0	1	2	3	4
Comments (Σχόλια):					

(9) I was not distressed at all during labour (Δεν ήμουν καθόλου αγχωμένη κατά την διάρκεια ου τοκετού).

	SA	A	NA/D	D	SD
Scores	4	3	2	1	0
Comments (Σχόλια):					

(10) The delivery room was clean and hygienic (Το δωμάτιο όπου έγινε ο τοκετός ήταν καθαρό και υγιεινό).

	SA	A	NA/D	D	SD
Scores	4	3	2	1	0
Comments (Σχόλια):					

