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# The Birth Satisfaction Scale: Igbo adaptation, validation, and reliability study

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## Abstract

### Objective

To investigate the validity and reliability of the Birth Satisfaction Scale – Revised (BSS-R) Igbo version.

### Materials and Methods

A cross-sectional study was done among 500 women who delivered at Alex Ekwueme Federal University Teaching hospital Abakaliki between 1<sup>st</sup> March 2019 and 31<sup>st</sup> August 2019. The BSS-R questionnaire was used for data collection in the postnatal ward. Data obtained were analyzed using SPSS version 20. The properties of the scale were tested by conducting reliability and validation analyses. The level of significance is a P-value of <0.05.

### Results

The mean age of the women was 28.8±4.7 years; the majority (230, 46.0%) were between the age group of 30 – 40 years. More than 90% of the study participant had formal education. The majority (460, 92.0%) were multipara and had delivered mostly (326, 65.2%) at Full Term. Three Component loading was identified in the Scale. Examination of the pattern matrix showed three components/themes: support by staff during labour (I felt well supported by staff during my labour and birth ( $r = 0.875$ ); parturient confidence during labour (I felt out of control during my birth experience ( $r = 0.714$ ) and distraught during labour (I was not distressed at all during labour ( $r = 0.821$ )). Community value ( $r^2$ ) mostly ranged between 0.507 and 0.801. The scale had a Cronbach's alpha coefficient of 0.62. This increased to 0.70 following the removal of "I was not distressed at all during labour" responses from the analysis.

### Conclusion

The Igbo version of BSS-R has good internal consistency. It is a valid and reliable scale to be employed in assessing maternal satisfaction among Igbo-speaking women in the study area and Nigeria in general.

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## Introduction

Patient satisfaction is defined as the individual's positive evaluation of a distinct dimension of health care<sup>[1]</sup>. It is, therefore, an evaluation of health care services from the patient's perspective which is important in auditing care. It places the childbearing woman at the forefront of care as women's views of their maternity care are in increasing domain of some national thinking<sup>[2][3]</sup>. Maternal satisfaction is a multidimensional construct that is difficult to assess. The Donabedian model is a conceptual model that provides a framework for examining health services and evaluating the quality of health care<sup>[4]</sup>. According to the model, information about the quality of care can be drawn from three dimensions of "structure," "process," and "outcomes" categories. The structure includes all of the factors that affect the context in which care is delivered. The process is the sum of all actions that make up healthcare while the outcome contains all the effects of healthcare on patients or populations, including changes to health status, behavior, or knowledge as well as patient satisfaction and health-related quality of life. Outcomes are sometimes seen as the most important indicators of quality because improving patient health status is the primary goal of healthcare<sup>[5]</sup>.

There is a global variation in the level of maternal satisfaction with a higher maternal satisfaction score in developed economies<sup>[6][7]</sup>. This might be attributed to better social, human, economic, and capital development seen in these economies<sup>[8]</sup>. In Nepal, Panth et al.<sup>[9]</sup> in a hospital-based study reported that more than four-fifths of the respondent in their study were satisfied with the care they received during childbirth. This finding is in tandem with the work of Odetola

et al. [7] in Ibadan Nigeria and Asres et al. [6] in Ethiopia. The satisfaction score recorded in the above studies is however much higher than yet to be published finding in the study area. These studies highlight the importance of strengthening the process of care in increasing maternal satisfaction scores. This is in line with an earlier review on this subject by Srivastava et al. [5] which advocated the need for the improvement of interpersonal behavior by the health worker to the parturient as women expect to be treated respectfully, irrespective of socio-cultural or economic context. Attitudes and behaviors of maternal healthcare providers influence healthcare seeking and quality of care [10].

Globally, the maternal mortality ratio has been reported to be 223 per 100 000 live births with 287 000 maternal deaths occurring in 2020 [11]. The majority (95-99%) of these deaths occur in developing countries in sub-Saharan Africa [11][12]. The high maternal [13] and perinatal [14] mortality rates that were reported in Nigeria are unacceptably high and ensuring access to good-quality maternal and child health care could prevent most of these deaths [14][15][16][17]. Good quality maternal health services are advocated as a panacea for about 30 million pregnant women globally who were at risk of complications during pregnancy [18]. High-quality maternal care should be a continuum that is built on the concept of Birth Preparedness and Complication Readiness (BP/CR) [19].

Various instruments have been used to assess maternal satisfaction which tends to address the multidimensional construct of satisfaction. The birth satisfaction scale (BBS) is one such tool. It was developed by Caroline Hollins Martin and Valerie Fleming to evaluate the birth perception of women [20]. It is a 30-item psychometric scale that assesses women's perceptions of birth and has undergone some modification [21] for the easy application given rise to BSS – Revised (BSS –R). It is a 10-item scale with three (3) subscales that measure the quality of care provision, women's personal attributes, and stress experienced during labor. The BSS -R was developed to facilitate researchers, maternity care staff, and consumers to construct a meaningful picture of what constitutes women's like or dislike of the childbearing experience. It appears to be a reliable instrument for measuring postnatal women's birth satisfaction [20]. Its veracity as an instrument of BS needs to be confirmed in the different societies of the world. Studies done in Greece [22] and Turkey [23] have shown that the instrument is a veritable tool with good internal consistency for assessing maternal birth satisfaction. Many countries now develop their scale to suit their need hence the need for Nigeria to develop its version. The quality of maternal birth satisfaction has an immediate and long-term effect on the woman's health and the quality of her relationship with her child [5][6][16][18][24]. This study is to evaluate the validity, and reliability of the Nigerian version (Igbo) of the Revised Birth Satisfaction Scale in a sample of women that had a normal delivery.

## Materials and methods

### Study design

The study was a descriptive, analytical cross-sectional study involving booked pregnant women who delivered in Alex Ekwueme Federal University Teaching Hospital, Abakaliki (AE-FUTHA).

### Study area/setting

This research was conducted in Abakaliki. It is the capital of Ebonyi state in South-East Nigeria. It has 13 Local Government Areas, one urban, one semi-urban with the rest being rural. It occupies a landmass of 5935km<sup>2</sup> space sharing boundaries in the west with Enugu state, Cross River State in the East, Abia state in the south, and Benue state in the north. Ebonyi state has an estimated population of 2.3 million people, while Abakaliki has 198,793 people of which 96,463 are males and 102,330 are females. In Abakaliki, women of the reproductive age group constitute 20% of the people, and about 75% of the entire population dwells in rural areas with farming as their major occupation.

AE-FUTHA is the only tertiary health facility located in the capital city of the state and receives referrals mostly from parts of the state and also from the neighboring states of Benue, Enugu, Cross River, and Abia. The hospital has an Obstetrics and Gynaecology department manned by 30 consultants divided into 5 teams with antenatal clinics being conducted from Monday to Friday. There are 17 beds in the antenatal ward, 50 beds in the postnatal ward, 34 beds for gynaecologic patients, and 6 beds in the labour ward. The annual antenatal clinic patient load is about 4200 clients, and about 3600 deliveries occur yearly.

## Study population

The study population was recruited in the postnatal ward of the hospital between 1<sup>st</sup> March 2019 and 31<sup>st</sup> August 2019. The inclusion and exclusion are detailed below. General counseling on the nature of the study and consent were sought from the women prior to their recruitment. Ballot method of simple random sampling was used for the recruitment of the study population. An equal number of white cardboard paper marked 'Yes' (inclusion) and 'No' (exclusion) were placed in a black polytene bag. Women that met the inclusion criteria were asked to select a card with a replacement after shaking the bag of cards. A woman selecting a card marked 'Yes' will be included.

## Inclusion criteria

The study population were women who consented to participate in the study and were recently delivered within the previous three (3) days. They were booked women who were fluent in the Igbo language and had a normal vaginal delivery with a good fetomaternal outcome.

## Exclusion criteria

Women excluded were those delivered by cesarean section, pregnancy complicated by a medical disorder, pregnancy/childbirth complicated with untoward obstetrics outcomes such as neonatal admission or death, post-partum haemorrhage and eclampsia. Pregnancy complicated with psychiatry problems, fetal intrauterine growth restriction/retardation and maternal near miss were also excluded.

## Data collection

The questionnaire was administered by a trained research assistant who read the questions to them and chose the

answers based on their response. Those who were learned were asked to answer the questionnaire which was in Igbo. Other relevant information was obtained from the patient case note. They were interviewed on days 2 to 4 post-delivery. They were interviewed using a semi-questionnaire and BSS-R questionnaire. Some of the data obtained were their socio-demographic characteristics, booking status, indication for the cesarean section, neonatal outcome and post-operative care. The social class of the study population was determined based on the educational level of the women and the occupation of the husband. They were graded into social classes 1 to 5 [24].

## Sample size

The sample size for the study was calculated using the formula for cross-sectional study:

$$n = Z^2 * P (1-P) / d^2$$

Where:

n = sample size

Z = 1.96 at a confidence level of 95%

P = an estimated prevalence of 50% for an unknown sample population

D = acceptable error margin of 5%

$$n = 1.96^2 * (1-0.5) / 0.5^2$$

n = 418; the addition of a 20% attrition rate increased the sample size to 501.6. A sample size of 500 was adjudged to be adequate and was used for the study.

## Study instrument

The BSS - R is a 10-item self-report scale that consists of statements that represent birth satisfaction<sup>[20][21]</sup>. Each item was scored on a 5-point Likert scale ranging from 0-4, with response options that range from 0 (totally satisfied) to 4 (not at all satisfied), and a total score was calculated (0-40). Items that measure negative statements were reverse-scored and with a lower score indicating a more positive maternal birth experience.

## Scoring the Birth Satisfaction Scale-Revised (BSS-R)

The Birth Satisfaction Scale-Revised (BSS-R) is easily scored. A score of 0 represents no birth satisfaction and 40 highest satisfaction (range 0-40). Each item is scored on a descending rating from 'Strongly Agree' with a score of '4' to 'Strongly Disagree' with a score of '0'. However, items 2, 4, 7, and 8 are reverse scored. The following scoring grid details the score that should be given for each individual item.

## BSS – R

BSS-R item	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Item 1	4	3	2	1	0
Item 2	0	1	2	3	4
Item 3	4	3	2	1	0
Item 4	0	1	2	3	4
Item 5	4	3	2	1	0
Item 6	4	3	2	1	0
Item 7	0	1	2	3	4
Item 8	0	1	2	3	4
Item 9	4	3	2	1	0
Item 10	4	3	2	1	0

**Key**

ITEM 1 - I came through childbirth virtually unscathed; ITEM 2 - I thought my labor was excessively long; ITEM 3 - The delivery room staff encouraged me to make decisions about how I wanted my birth to progress; ITEM 4 - I felt very anxious during my labor and birth; ITEM 5 - I felt well supported by staff during my labor and birth; ITEM 6 - The staff communicated well with me during labor; ITEM 7 - I found giving birth a distressing experience; ITEM 8 - I felt out of control during my birth experience; ITEM 9 - I was not distressed at all during labor; ITEM 10 - The delivery room was clean and hygienic.

The BSS-R comprises the following three subscales:

Subscale	Subscale items	Score range
Stress experienced during labour	1, 2, 7, 9	0-16
Women's Personal attribute	4, 8	0-8
Quality of care provision	3, 5, 6, 10	0-16

**Translation and pilot study**

The 10-item BSS was translated by 2 independent bilingual translators. One other bilingual translator, who did not have knowledge of the original instrument, then back-translated the re-conciliated Igbo version. The backward translation was sent to a group of Igbo - English experts for comments. The translated questionnaire was culturally adapted through a cognitive debriefing process that was used to identify any language problems and to assess the degree of respondents' understanding of the item content that is meant to be elicited. In a pilot study, the new Igbo version of the BSS-R was tested among 30 Igbo-speaking mothers.

**Validation and reliability of scale**

Following the adaptation of the scale into the Igbo language, a content validation study was performed using expert opinion method. To that end, expert opinions of 10 obstetricians interested in this subject were obtained. These experts were asked to evaluate each item of BSS-R on a Likert scale of 4 points. Excellent, 1; Good, 2; Average, 3; Poor, 4. For the validation of the Expert Opinion, Kendal W analysis was used. Factor analysis was used to assess the factorial design of the scale.

### Ethical aspect of the study

Ethical approval for the study was obtained from Health Research Ethics Committee, AEFUTHA. The approval number is FETHA/REC/2/2019/182. For the adaptation of the original Birth Satisfaction Scale into the Igbo language, approval was obtained from Caroline J Hollins Martin.

### Informed consent

A signed consent was obtained from every participant before enrolment into the study

### Statistical analysis

The data were analyzed using IBM SPSS statistic 20 software. Descriptive characteristics (including means, standard deviations, frequencies, and percentages) were calculated for the socio-demographic variables. For the validation of the Expert Opinion, Kendal W analysis was used. Test for reliability was done using Cronbach's alpha coefficient, item analysis and split-half test. The level of significance was accepted as  $p < 0.05$ .

## Results

**Table 1.** Socio-demographic and obstetrics variables of the study population

Variables	N (%)
<b>Age (years)</b>	
≤24	80(16.0)
25-29	14(2.8)
30-34	230(46.0)
35-39	122(24.4)
≥40	54(10.8)
<b>Marital status</b>	
Single	72(14.4)
Married	426(85.2)
Divorced	2(0.4)
<b>Educational level</b>	
Informal	12(2.4)
Primary	30(6.0)
Secondary	204(40.8)
Tertiary	254(50.8)
<b>Occupation</b>	
Trading	160(32.0)
Farming	26(5.2)
Artisan	32(6.4)
Housewife	118(23.6)
Government employment	106(21.2)
Others	58(11.6)
<b>Social class</b>	
1	68(13.6)
2	98(19.6)
3	158(31.6)
4	122(24.4)
5	54(10.8)
<b>Parity</b>	
Grand multipara	40(8.0)
Multipara	460(92.0)
<b>Gestational age</b>	
Early term (37 – 38 weeks and 6 days)	174(34.8)
Full term (39 – 40 weeks and 6 days)	326(65.2)

Table 1 represents the social and demographic characteristics of the women. The mean age of the women was  $28.8 \pm 4.7$  years; the majority (230, 46.0%) of the women were between the age group of 30 – 40 years. More than four-fifth (85.2%) of the women were married. Two-fifth (2.4%) of the study participant had informal education with the remaining having



had formal education. Less than 2/5th (176, 35.2%) of the women were in lower social class, 31.6% (158) belong to the middle class while 33.2% (166) were in higher social class. The majority (460, 92.0%) were multipara and had delivered mostly (326, 65.2%) at Full Term.

**Table 2.** Items of the birth satisfaction scale both in English, and Igbo

Item number	English BSS-R	Igbo BSS-R
1	I came through childbirth virtually unscathed.	A mụchara m nwa n'enweghị mmerụahụ/nsogbu ọbụla.
2	I thought my labour was excessively long.	Echere m na ime mefere m oke.
3	The delivery room staff encouraged me to make decisions about how I wanted my birth to progress	Ndị na-eji ime gbara m ume ka m kpebie otu ịmụ nwa m ga-esi gaa.
4	I felt very anxious during my labour and birth	Obi kooro n'elu n'oge ime na-eme m na oge m na-achị nwa.
5	I felt well supported by staff during my labour and birth	Enwetera m nnoọ ezi nkwardo n'aka ndị ọrụ na-eji nwa, mgbe ime na-eme m na mgbe m na-achị nwa.
6	The staff communicated well with me during labour.	Mụ na ndị ọrụ kparịtara nke ọma n'oge ime na-eme m.
7	I found giving birth a distressing experience.	Ịmụ nwa bụ ụrụ m ihe nhūjuanya.
8	I felt out of control during my birth experience	Ọ dīcha m ka ihe niile apụọla m n'aka/ ọ nweghị ihe m ga-emenwu oge m na-amụ nwa.
9	I was not distressed at all during labour.	E nweghị m mgbakwasị ahụ ọbụla ka m na-achị nwa.
10	The delivery room was clean and hygienic	Ụlọ ọmụmụ nwa ahụ dīnnoọ ezigbo ọcha maka ahūike

Respondents response for each item on the BSS-R scale (English / Igbo): Strongly agree - Ekwenyesiri m ike; Agree - Ekwenyere m; Neither agree nor disagree - E nweghị ebe m kwụ; Disagree - Ekwenyeghi m; Strongly disagree - Ekwenyeghi m ma ncha

**Table 3.** Pattern matrix based on factor analysis

BSS –R ITEM	Component			
	Factor 1	Factor 2	Factor 3	Communalities
I came through childbirth virtually unscathed.	.275	-.123	.645	.457
I thought my labor was excessively long.	-.059	.678	-.279	.507
The delivery room staff encouraged me to make decisions about how I wanted my birth to progress	-.176	.216	.269	.146
I felt very anxious during my labor and birth.	.108	.708	-.036	.546
I felt well supported by staff during my labor and birth.	.876	.087	.004	.807
The staff communicated well with me during labor.	.829	.102	-.091	.754
I found giving birth a distressing experience.	.138	.691	.287	.627
I felt out of control during my birth experience.	.222	.657	-.022	.543
I was not distressed at all during labor.	-.256	-.053	.726	.629
The delivery room was clean and hygienic.	.751	.122	.094	.615

## Findings related to the validity of the birth satisfaction scale

### Content validity

Following content validity tests, assessment scores of ten experts were evaluated by Kendall W analysis, and W value was found to be 0.70 points without any difference among experts ( $p > 0.05$ )

### Construct validity

Construct validity was assessed using factor analysis. Analysis showed that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.789, Approximate Chi-Square value of 696.45 and Bartlett's Test of Sphericity was statistically significant at a level of  $p = 0.001$ . Factor structure analysis of the Birth Satisfaction Scale using Principal Components Analysis extraction method, and correlated (Direct Oblimin) rotation revealed a 3-factor loading. Component 1 explained 34.25% of total variance while the other two components has less than 20.00% of total variance explained. These factor loadings were based on an Eigenvalue of 1 and above. Examination of the pattern matrix showed that I felt well supported by staff during my labour and birth had the highest loading ( $r = 0.875$ ) on component 1 (support by staff during labour) while I felt out of control during my birth experience ( $r = 0.714$ ) and I was not distressed at all during labour ( $r = 0.821$ ) loaded more on component 2 (parturient confidence during labour) and component 3 (distraught during labour) respectively. With the exception of the communality value (a unit change in each factor attributed to 3-factor loading of the scale) of 0.283 seen with, 'I came through childbirth virtually unscathed'; the communalities ( $r^2$ ) ranged between 0.507 and 0.801.

## Findings related to the reliability of the birth satisfaction scale

### Item analysis

From item total score analysis, the correlation values of the scale were found to range between  $-0.166$  and  $0.50$ . Removal of an item with correlation values of  $-0.166$  and below significantly affected Cronbach's alpha value, its retention in the analysis and scale was deemed not to be appropriate.

### Split-half test

Split-half test showed a total mean score of  $22.22 \pm 5.54$  with a variance of 30.79. The corrected total item correlation values of the scale range between  $-0.166$  and  $0.505$ . The Spearman-Brown coefficient value was 0.655 with a Guttman Split-Half coefficient of 0.654. A negative correlation was only seen with the question "I was not distressed at all during labour". Removal of the question is associated with an increment of Spearman-Brown coefficient value (0.710), the question was deemed to be inappropriate and was removed from the analysis.

### Internal Consistency

The scale had a Cronbach's alpha coefficient of 0.62. This increased to 0.70 following the removal of "I was not distressed at all during labour" responses from the analysis.

## Discussion

Maternal birth satisfaction (MBS) is associated with improvement in maternal and child development and uptake of maternity care in subsequent obstetric endeavors. [24][25] Proper assessment of MBS requires an appropriate tool for its assessment. BSS is a tool that has been recommended for the assessment of MBS. [20][21] Originally, it has 30 items which have been modified for easy applicability resulting in BSS-R with good internal consistency. [21] Application of the scale in a different cultural domain from the original place where it was developed requires its validation and adaptation of which current study is aimed to fulfill. It thus requires analysis of its psycholinguistic, and psychometric properties. [26]

Validation of a study instrument is important in the evaluation of the adequacy of an instrument in measuring the parameter of interest. Validity is defined as the extent to which an instrument measures what it asserts to measure. It requires precise definitions of variables that require an accurate and consistent representation of its characteristics. Scale validity is important for an effective research. Content validity, face validity, construct validity, and criterion-related validity are different types of validity tests. In our study, content and construct validity tests were used to evaluate the adapted Igbo BSS-R. Content validity is assessed in our study using expert opinion as content validity usually depends on the judgment of experts in the field. The Kendall W analysis of experts' assessment scores was found to be 0.14 points and without any difference among experts ( $P < 0.001$ ). The finding thus justifies the retention of all the items in the BSS-R in our study. This finding is similar to a previous study in Turkey. [27] Construct validity was assessed using factor analysis. Analysis showed that Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.789;  $p=0.001$ , Approximate Chi-Square value 696.45 and Bartlett's Test of Sphericity was statistically significant at a level of  $p=0.001$ . These findings showed that the items of the scale have a high correlation and are adequate for factor analysis.

From our study population, the instrument on factor analysis has three (3) factor loading reflecting three themes as originally documented [22], these domains include quality of care provision, personal attributes and stress experienced during labour. The first factor (F1) has a high matrix loading with the following item of BSS-R - I felt well supported by staff during my labor and birth, the staff communicated well with me during labor and the delivery room was clean and hygienic. I felt well supported by staff during my labor and birth loaded highest and it was used in naming the F1 as Quality of care. The second factor (F2) includes the following: I found giving birth a distressing experience, I felt very anxious during my labor and birth and I thought my labor was excessively long. The highest loading was seen on I felt very anxious during my labor and birth which was used in naming it as: stress during labour. The last factor loading (Factor 3, F3) represents Personal experience during labour, extrapolating from its highest factor loading of - i was not distressed at all during labor. Our findings thus confirm the multidimensionality of BSS-R in keeping with earlier reports. [22][28] finding from our study, shows that the Igbo BSS-R with some modifications is a veritable birth satisfaction scale that can be applied in the study area for the assessment of MBS.

The Exploratory Factor Analysis on the 10-item Igbo-BSS revealed 3 orthogonal factors (KMO of 0.789, and Bartlett's Test of Sphericity was statistically significant at a level of  $p=0.001$ ) which agrees with the Scotland validation study where a three-factor model was reported in a BSS-R scale; It was found to offer an adequate fit to the data. [28] Our findings agree with earlier findings on the multidimensionality of BSS. [28][29] Our evaluation thus demonstrates a three-factor structure (F1: 'quality of care', F2: 'stress during labour, and F3: 'personal attributes) and suggests that the Igbo BSS-R is a robust, valid and reliable multidimensional psychometric instrument for the assessment of MBS. Previous studies in Turkey, [26][27] Greece, [22] and Scotland [29] were able to demonstrate the robustness of BSS in assessing MBS which is supported by our findings. In a similar study by Cetin et al. [26] which evaluated the Turkish adaptation of BSS, explanatory factor analysis revealed a 4-factor structure which explained 37.61% of the total variance with an Eigenvalue of 1.00. [26] Our study shows that Factor 1 explained 34.25% of total variance while the other two Factor loadings (F2 & F3) have less than 20.00% of total variance explained.

Reliability is an important concept that x-rays to which extent a measurement of a phenomenon provides a stable and consistent result. [26][30] It exposes the internal consistency of a scale on how the items of a scale "hang together" and measure the same construct. [26][30] The Reliability describes consistency within the employed analytical procedures obtained by applying a measurement tool (scale) on a certain population. [30][31] In our study, testing for the reliability of the translated Igbo BSS-R was done using the Cronbach's alpha coefficient, item analysis and split-half test. The scale has a Cronbach's alpha coefficient of 0.62 which is similar to the finding from BSS adaptation into the Turkish language. [26] Even though no absolute rule exists for the interpretation of Cronbach's alpha coefficient, it is suggested that reliability should be equal to or above 0.60 for an exploratory study. [30] Four cut-off points have been suggested for the categorization of reliability thus: excellent reliability (0.90 and above), high reliability (0.70-0.90), moderate reliability (0.50-0.70) and low reliability (0.50 and below). [30] The Igbo version of BSS-R was found to have a Cronbach's alpha coefficient of 0.62. This was increased to 0.70 when the item ("I was not distressed at all during labour") with low correlation values was removed from the Igbo version of BSS-R. This increment of Cronbach's alpha coefficient of 0.70 markedly improved the robustness of Igbo BSS-R; Cronbach's alpha coefficient of 0.70 has been argued as the minimum level of internal consistency coefficient for a measurement scale. [30] An increase in Cronbach's alpha coefficient of between 0.60 and 0.80 is a reliable indicator an adequate internal consistency. [28] Our Cronbach alpha of total scale of 0.70 is similar to an earlier report by Serhatlıoğlu et al. (0.71) in Turkey. [28]

Split-half analysis is another form of internal consistency reliability performed in our study; It gives an aggregate measure of reliability after splitting the test into two halves. In our study, the Spearman-Brown coefficient value is 0.655 with corrected total item correlation values of the scale ranging between - 0.166 and 0.505. The item "I was not distressed at all during labour" is associated with a negative correlation in Igbo BSS-R. Removal of the item from Igbo BSS-R is associated with an increment of Spearman-Brown coefficient value to 0.710 which increases the veracity of the scale. The above finding thus emphasizes the need for a deliberate attempt to be made by health managers in eliminating factors that will increase maternal distress during labour. This will entail the provision of enabling labour environment, prompt maternal care, proper maternal communication during the course of labour and adequate pain relief during labour. [32][33][34] It is also important that personal attributes and quality of care components of maternal satisfaction be

improved to indirectly reduce the amount of distress witnessed by a woman during labour. [\[21\]\[28\]\[35\]](#)

## Limitations of the study

Some of the limitations of the current study include the exit interview that was done for the study population. During this period, the woman's social and psychological well-being might have negatively affected her care and demands of a newborn which will affect her ability to truly give a candid response to questions. This is the period when issues like puerperal blues might occur thereby interfering with accurate data collection. An effort was however made to avoid recruiting women who are susceptible to postnatal psychological issues like women whose neonates are admitted to the neonatal intensive care unit. Our study is also limited by its single-centered nature. The outcome of our finding might not be applicable to other Igbo women outside the state of our study. A multi-centered study in southeast Nigeria among Igbo women would have been preferred to help the application of the Igbo BSS-R. We advocate for such a study to help authenticate our findings.

## Conclusion

From our study, Igbo BSS-R can be considered a psychometrically valid and reliable 10-item multidimensional instrument for the assessment of maternal childbirth satisfaction among Igbo women of Nigeria. To improve the veracity of its reliability among Igbo women in maternity care in Nigeria in assessing maternal childbirth satisfaction, item 9 of Igbo BSS-R should be deleted. Deletion of item 9 is associated with an increase in Cronbach's alpha coefficient. The Igbo BSS-R is a back translation of the original BSS-R developed by Hollins Martin et al. which has been appraised as a veritable and suitable scale of choice to assess maternal childbirth satisfaction.

## Declaration

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### Conflict of interest

The authors declare that they have no competing interests. To help reduce bias from the authors, data collection was carried out by trained resident students. The author made an equal financial contribution to the overall cost of conducting

the study.

#### Authors' contributions

CCA participated in the study design, data collection/analysis and interpretation of findings and drafting of the manuscript. USO, POM, OGKA & CCO participated in the data analysis and the interpretation of finding. UUN, GUE, CCM, JNE & ACI participated in the interpretation of findings and drafting of the manuscript. All participated in the review of the final manuscript. All the authors approved the manuscript.

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