

# Content Validation of Educational Materials on Maternal Depression in Nigeria

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## Research article

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# Abstract

## Background

Content validation is a process of obtaining evidence from experts to ensure that the domains or the message of a measurement tool or educational material performs its intended purpose. This study describes the validation of developed educational materials (poster, leaflet and song), which are available in local languages for health education on maternal depression in Ibadan, South-West, Nigeria.

## Methods

This cross sectional study used experts' judgement and clients' evaluation. Six experts and 50 maternal-child health clients for each material participated. Suitability Assessment of Materials (SAM) tool and its Yoruba translated version were used by the experts and the clients respectively. The outcomes include Cronbach alpha coefficient  $\geq 0.8$ , Item level- Content Validity Index (I-CVI)  $\geq 0.78$ , Scale – Item Content Validity/ Universal Agreement (S-ICV/UA)  $\geq 0.8$ , interclass coefficient (ICC)  $\geq 0.7$ , and the proportion of of rating of suitability assessment of material among clients. Reliability test, calculation by formula. descriptive statistics and Fisher exact were used respectively for the statistical analysis with SPSS version 25.

## Results

The mean age of the experts was  $41.6 \pm 7.2$  years and that of maternal child health clients was  $30.7 \pm 5.4$  years for poster,  $31.3 \pm 5.2$  for leaflet and  $29.0 \pm 5.1$  for song. Cronbach alpha reliability coefficient of the translated SAM were; 0.69 for poster, 0.87 for leaflet and 0.20 for song. The Interclass Coefficient (ICC) of all the materials were; leaflet (0.97); poster (0.89); song (0.98) and the internal consistency Cronbach alpha coefficients  $>0.8$ . The validity index for the materials were; leaflet (0.94), poster (0.94) and song (1.00). The Item Scale Level Universal Agreement (S-ICVI/UA) was  $>0.8$  for all the materials. Nearly all clients (96%) rated song content as superior. The poster and leaflet were rated as superior by 74% and 68% of clients respectively. Clients rated the content, literacy demand and cultural appropriateness domains as superior regardless of their sociodemographic characteristics.

## Conclusion

These locally developed education materials for maternal depression have excellent content validity of experts and were highly rated by clients. This process should inform the development of content of other education materials in Africa.

## Background

Validation is a widely known scientific process for ensuring that a particular material is adequate to perform the task it is meant to perform (1). It is widely used in the development of measuring scales or research questionnaire (2). Its application has been found to be relevant in most studies on Information

Educational and Communication (IEC) materials (3);(4). However content validation of educational materials is commonly conducted in studies from the high income countries (5).

In the low and middle income countries (LMICs), print educational materials are widely used to address prevailing health conditions (6); (7) and (8). However, studies showing their development and validity are scarce. Although the use of targeted educational materials for health education is emphasized in the primary health care guideline in Nigeria (9), but not all prevailing health condition is being addressed in the primary health care routine health education. Maternal depression is one of them (10). Maternal depression is a common condition which requires health education (11),(12). (13) recommended intense enlightenment through health communication to address maternal depression in LMICs. Since misconceptions about maternal depression are common among the Yoruba community in Nigeria (14), there was a need to develop and validate materials which provide health education on it.

So far, standard guidelines for validation of educational materials are scarce, but guideline on validation of scales and research instrument are available (2). The methodological research shows the details of process of development of the material and the validation in phases with focus on either suitability, relevance, readability, comprehensibility or adequacy of the materials. Most studies have investigated education materials in terms of suitability ((15); (16); (17); relevance (3) ; content and readability or understanding of audio visual materials (18) and adequacy(4). These studies have used various instruments including Suitability Assessment of Materials (SAM) (19). Comprehensibility Assessment of Materials CAM (20), Adapted questionnaire (21) and Patient Educational Materials Assessment Tool (PEMAT) (22). Studies from Nigeria have hardly used these tools because the development of educational materials is often a process in a study and are rarely published (23). Countries like Taiwan and Sweden (24);(20) have translated SAM for the use in validating educational materials.

In our study, we translated SAM into Yoruba language and used the content validation process found in literature (3) and (2) to validate print and song materials on maternal depression. The primary goal is to make validation process and the validated health education materials on maternal depression widely available for health educators in Nigeria and elsewhere.

## **Methods**

### ***Study design and setting***

This is a cross sectional study embedded in a parent study which implemented and evaluated training and supervision of health talk delivery on maternal depression. The parent study was carried out among primary health care workers in Ibadan, Nigeria. This study was set to validate educational materials for the parent study.

This validation study took place in two of five local government areas (LGAS) in Ibadan metropolis, where the experimental arm of the parent study was conducted. In the experimental arm, primary healthcare (PHCs) implemented the parent study while primary health clinics which were a level lower than the PHCs

were used for the validation of materials. PHCs offer more comprehensive services including laboratory testing, 24-hours service, minor surgery and admission in addition to the out-patient services to a larger population of approximately 20,000 people while the primary health clinic serve up to 5,000 people, only offering outpatient services and are a referral services for mobile health posts.

### ***The materials for validation***

We developed three education materials (poster, leaflet and a song) on maternal depression which are shown in figures 1-3. The maternal child health clients of fifth to seventh grade pretested and evaluated the materials in terms of understanding, clarity and containing satisfactory information. The content of these materials was built on the concept of health belief model (25) with a clear definition of maternal depression, risk factors which addresses perceived susceptibility and consequences of maternal depression. These materials were developed in Nigerians' three common languages; Yoruba, Pidgin and English. Our study predominantly utilized the Yoruba version because it is the language of the end users (the clients). The content validation of these materials was guided by "The best practice for developing and validating scales for health, social and behavior research (2).

Experts who could make professional contribution to the content, context and concept of the materials validated the suitability of their contents. To be included as an expert, one had to be from one of the following professional backgrounds: mental health, maternal-child health, public health nursing in mental health, health promotion, antenatal care and health communication. Experts who were not bilingual for Yoruba and English language were excluded. Eighteen experts (six per material) were recruited through snowballing(4) . They were given copies of the materials and the tool (Suitability Assessment of Materials) for scoring at home for one week. The song was loaded on their mobile phones. They validated the suitability of the content of the educational materials shown in figure1-3 before being used by the clients in the maternal-child health clinics.

### ***Characteristicsof study participants and selection procedure***

The primary study participants were maternal child health service users; nursing mothers and pregnant women. To be included in the study, they had to be accessing routine care at the selected clinics, be able to read Yoruba language and should be available in the waiting area to attend to education sessions. Those who were in a hurry to leave or had a sick child were excluded.

A convenient sample size of 50 was taken that provided a power of 93% at 95% confidence level, margin of error 5%, assuming a loss to follow up of 10% to estimate that 90%  $\pm$ 20% of women rating the materials as suitable (3).

From two selected LGAs, three clinics with the highest patient load according to the clinic record during the period of the study were purposively selected. The three clinics (A, B, C) were selected from Ibadan North LGA and three clinics (X, Y, Z) from Ibadan North East LGA. The clinics names were written and rolled into paper balls that were placed inside a container. Three empty boxes had 'poster', 'leaflet' and

'song' labels written on them. Someone who was not part of the study was invited to randomly pick the first set (A, B, C) into the each of the empty boxes. The same process was repeated for (X, Y, Z). The 50 clients for each material (25 clients from each clinic) were selected randomly as follows: Paper balls labelled "yes" and "no" (50 each) were placed in a box and each eligible client at the clinics was asked to pick one. The clients who picked 'yes' each day and consented to participate were recruited. This process was repeated on every clinic day until 50 clients for each material in each clinic were recruited.

### ***Instrument and Data collection procedure***

The Suitability Assessment of Materials (SAM), a structured standardized tool (26) was used for assessment of the educational materials. It is adaptable to any materials including audiovisual, audio, print or book and freely available for use. SAM has 22 items spread across six domains; content, context, graphics, topography, simulation and cultural appropriateness. Not all the domains are relevant to all materials. Since SAM does not have a socio demographic information section, we added it as a separate a section on the tool.

The need for translation of SAM became necessary because the end users (maternal-child health clients) at the primary health care had low education. The SAM has never been used in Nigeria but it has been translated to Chinese (24), Turkish language by Akansel's study on breast cancer educational materials as cited by (27), (28), Swedish language (29). We adapted the methods used in these studies involving forward translation, backward translation, synthesis, experts' review and pretest in our study. Five translators recruited through snowballing translated SAM to Yoruba. Two translators who are bilingual in Yoruba and English languages translated the original English SAM into Yoruba independently. A master degree holder in English language, whose mother tongue is Yoruba back translated SAM into English. The back translation was then reviewed by two independent English linguists. They synthesized the original English SAM with the back translated English SAM. Through this they were able to find differences in loss of original meaning in the back translated version (30). This necessitated reviewing the Yoruba SAM again until the back translation gave the same meaning as the original English version of SAM. The domains of the Yoruba SAM were adapted for the leaflet, poster and song materials. After this, the researchers pretested the three Yoruba SAM on a population which was similar to the end users of materials for validation. A convenient sample size of 15 maternal-child health service users who could read Yoruba language (7 pregnant women and 8 nursing mothers) participated in the pretest for each Yoruba translated SAM. Three research assistants were recruited to document comments from the clients. All the domains of SAM which were difficult to understand were flagged by the participants. In the process, they were encouraged to speak out loudly about their concerns while reading the SAM to rate the Yoruba version of the educational materials. Meanwhile, the Research Assistants assigned to each person took note of the concerns and suggestions. The responses from the pretest was checked with response of the experts who used original English SAM to validate English version of the materials. The inconsistencies found in the comparison of the responses to the English SAM and translated SAM were corrected by translators and researcher. The Pretest was repeated until the translated SAM elicited right responses.

### ***Data collection process***

Content validation of materials by experts is a requirement in the development of educational materials (2). Experts made use of the relevant domains of the original Suitability Assessment of Materials (SAM) to rate the English version of each material. Since the song has no English translation they used the translated Yoruba SAM to rate the song. The ratings of the experts were used to validate the suitability of the content of the materials. The outcome was used to compute content validity index of each materials and comments were used to improve the materials further before the end users' validation.

The Research Assistants (RAs) who worked on the pretest of Yoruba translated SAM are Yoruba speaking and they are well experienced in research data collection. Each RA was assigned to a material, trained in consent taking and the administration of SAM tool. The RAs used the SAM to ask participants questions and they recorded the rating/comments on the materials for each domain on SAM. The process lasted for one week on the poster and the song but the leaflet took up to 2 weeks because it has more content.

### ***Measurement and Data processing***

The primary outcome variable for this study is the validity index of the materials (poster, leaflet and song) as rated by experts and by maternal child health service users. The secondary outcome is the Cronbach coefficient of reliability of the translated Yoruba SAM for poster, leaflet and song.

Validity index of the experts' rating was first analyzed which gave the materials the first authentication. An inter-rater analysis was carried out on the ratings of the 6 experts to obtain the interrater coefficient of agreement of all the experts. Cronbach alpha of >0.8 cut-off was used and the interclass correlation coefficient on the agreement of the 6 experts was set at p value set at >0.01 level of significance. Interclass coefficient of greater than 0.7 is regarded as moderate agreement while >0.9 is excellent agreement. Following this, validity index was calculated by formulas:  $I-CVI = \text{Number of experts who rated an item as adequate} / \text{total number of experts}$ ;  $S-CVI/UA = I-CVI \text{ rated } 1 / \text{total no of items}$  (31).

This validity index was computed on the experts' rating of the educational material with use of the 6 items on SAM (content, literacy, graphics, layout, simulation and cultural appropriateness). The suitability assessment was done for each item with rating as 2 for superior, 1 for adequate and 0 for not adequate. For the purpose of the computation of validation 1, and 2 are regarded as 1=adequate (4).

There are two kinds of Content Validity Index (CVI)(32): Item level- Content Validity Index (I-CVI) and Scale level – Content Validity Index Average (S-CVI/Ave) or Scale level- Content Validity Index/ Universal Agreement (S-CVI/UA). The I-CVI = the number of experts who rated the item 1 or 2 (adequate) divided by the number of experts. S-CVI/UA or S-CVI/Ave are both scale level CVI with different formulas. S-CVI/UA is calculated by adding all items with I-CVI equal to 1 divided by the total number of items. On the other hand, S-CVI/Ave is calculated by taking the sum of the I-CVIs divided by the total number of items. A scale with excellent content validity should be composed of I-CVIs of  $\geq 0.78$ , S-CVI/UA  $\geq 0.8$  or S-CVI/Ave  $\geq 0.9$ . After this, descriptive analysis was used to analyze the frequencies of the socio demographic

characteristics of the client participants and their suitability of assessment of the materials. The SAM score rates  $\geq 70\%$  (Superior: 2);  $\geq 70-40\%$  (adequate: 1) and  $\leq 40\%$  (not adequate:0). Chi square tests was used to assess the association of the sociodemographic characteristics and suitability rating with p-value of significance set at 0.05.

### ***Ethical consideration***

This study is part of parent study “Effect of training and supervision of maternal depression inclusive health education delivery among primary health care workers in Ibadan, Nigeria” which received an ethical review approval form the Ministry of Health, Oyo state Nigeria ref no AD 13/479/2016. Written consents were taken from the experts and the maternal child health service users who participated in the study. The consent contained the information about the study and voluntary nature of participation. The consent also assured participants of confidentiality and data protection. No names of individual were collected but codes were used as identifiers on the measuring instruments.

## **Results**

### ***Sociodemographic characteristics of experts for content validation of maternal depression education materials***

Table 1 shows the sociodemographic characteristics of 18 experts who participated in the validation of educational materials on maternal depression. Half were aged  $>40$  years, 94.4% were of the Yoruba tribe, 88.9% health workers, while 11.1% were in academia. Their professional background included mental health 3(16.6%), Child health 3(16.6%), Health promotion 3(16.6%), Public health 3(16.6%), maternal child health 3(16.6%) and health communication 3(16.6%) for each material.

### ***Inter-rater correlation and inter-class coefficient of experts' rating of educational materials as adequate***

Six experts rated each material. All the raters had inter-rater correlation agreement above 0.75 on the adequacy of the leaflet, while there was a weak inter rater correlation agreement for poster. There was no absolute agreement among all the raters on the adequacy of the poster. The agreement between expert 2 and 5; 6 and 1,2,3,4, have interrater coefficients  $<0.6$ . The song and leaflet material have no disagreement in the adequacy rating of all the experts. The agreement across all the experts are very strong with ICC  $\geq 0.8$ . The Cronbach alpha coefficients for all the materials are  $>0.80$  showing strong internal consistence and the overall interclass coefficients for the three materials are also  $>0.8$ . The agreement among the raters for the three materials is statistically significant  $p < 0.01$ .

### ***Experts' validation***

Table 2 shows the Item Level Content Validity Index (I-CVI) for poster, leaflet and song. Song has the highest I-CVI of 1(excellent content validity). The Scale level content validity/ Universal Agreement S-CV/AU among the experts is 0.83 ( $>0.8$ ) for all the materials (excellent content validity). The experts suggested that the content validation of the translated version of the materials should also be carried out.

The experts rated the suitability of the all the materials as superior and on the scale of 0-10 (as stated on the SAM tool), they got an average rating of 8 for poster, 9 for song and 8 for leaflet.

### ***Reliability of Yoruba translated SAM***

The Yoruba translated version of Suitability Assessment of Materials has Cronbach reliability coefficient of 0.69 on 20 applicable items rated for the Yoruba poster. Yoruba SAM for leaflet has a Cronbach alpha coefficient of 0.87 on the complete 22 items of the SAM. The Yoruba translated version of SAM has 0.20 Cronbach alpha coefficient on 10 items of SAM applicable for rating song. Many words on the scale do not have direct translation into Yoruba language. The following domains were severally translated back and forth before agreeing on their Yoruba terms: Layout and topography, graphic and illustration, learning simulation and motivation, cultural appropriateness (Logic, Language and Experience LLE). The translators agreed to provide translation which would receive the same response as the English SAM. The pretest responses of the maternal-child health clients were compared with the responses of the experts who used the English SAM for validation of materials. Their responses show that the translated version eventually got almost the same response as the English SAM. Translators suggested the following *all the domains which are not applicable to song or poster should not appear in their SAMs* and a column for remarks should be created.

### ***Socio demographic characteristics of maternal child health clients who evaluated education materials.***

Table 3 show the sociodemographic characteristics of maternal child health clients who participated in the rating of the suitability assessment of poster, song and leaflet on maternal depression. Their mean age is  $30.7 \pm 5.4$  years for poster,  $31.3 \pm 5.2$  years for leaflet and  $29.0 \pm 5.1$  years for song. Fifty participants rated each material. The category of pregnant women and nursing mothers were distributed equally across the 3 materials. Poster had all Yoruba tribe participants while song and leaflet had other tribes represented but majority are Yorubas 88% and 86% respectively. Majority of the participants achieved post-secondary school educational level (post grade 9) respectively as follows for Poster 38(76%), leaflet 30 (60%) and song 28(56%).

### ***The rating of adequacy of the content, literacy demand and cultural appropriateness of educational materials among the maternal-child health clients.***

The maternal child health clients used SAM to rate different materials. Nearly all participants for song 46 (92%) rated as superior, 37(74%) rated poster as superior and 34 (68%) rated leaflet as superior. There was no suggestion for improvement from the clients but they expressed what they liked about the materials as follows. *"The leaflet needs patience to read it. It has a sentence which addresses mothers and mother in-laws, that they should be supportive of any depressed mother by taking them to the hospital. The leaflet has a good picture showing husband and wife going to see a nurse. As a take home material the picture will teach men to follow their wives to the hospital"*. For all the materials they said. *"They enlighten mothers to know that depression is a sickness not something one can get over with time. The help seeking part of all the materials make us to know that hospital can treat depression very well"*.

Supplementary table 1 shows that regardless of the difference socio demographic background of the participants, they rated the content, literacy demand and cultural appropriateness as superior.

## Discussion

This study validated a poster, leaflet and song as materials used for health education on maternal depression and found these materials to have excellent validity index. We did not come across any other study in Nigeria that validated such education materials. A systematic review on the effect of print educational materials on professional practice and health outcome found only one study that validated print educational material in low and middle income countries (6). Our study was guided by a study in Brazil which combined the development and validation process of educational material on nutrition in pregnancy (3). The authors utilized SAM to achieve a similar finding of validity index  $> 0.8$  as found in our study. Other studies that used SAM and reported consistent findings to ours include a study in Portugal adolescents (4) and Washington (33) which all achieved excellent validity index. The content validation process of obtaining validity index is a quantifiable way of authenticating that a material will deliver the objectives it is made for (34). They validated their educational materials with Likert scale questionnaire and on the agreement among the clients' rater on cultural appropriateness, readability and clarity.

Furthermore, our study shows an excellent agreement Scale-Item Level Content Validity Index/Universal Agreement (S-ICVI/AU)  $> 0.8$  among the experts on all the materials. The highest qualification of the experts in our study was FWACP (Fellow of West Africa College of Physician) and the lowest Registered Nurse. Despite this disparity in qualification of experts, the internal consistence reliability is high for the three materials. These findings are in agreement with those of a study which utilized SAM ratings for nurses with minimum of 15 years experience in women's health or related field (35), and other experts with higher qualifications such as professors and PhD holders (4). This implies that regardless of the level of qualification of raters, ratings are unlikely to defer provided they have a background knowledge in the area of interest, which in our case was maternal depression. The concept of agreement among experts explains the significance of Delphi's technique which had long been used since 1950 to ensure a consensus of experts' forecast about the future (21). The agreement is what ensures credibility and the fidelity of the validation process. Our study used 6 content experts and 50 maternal-child health clients per material and the findings are consistent to those of studies that made use of different numbers. For example 21 experts and 39 adolescents were used for validation of materials on metabolic syndrome (4) and 22 experts and 38 pregnant women validated healthy nutrition for pregnant women print material (35), and Sousa et al made use of 10 experts and 20 patients, all showed levels of agreement similar to ours.

Irrespective of the excellent validity index of a material, it is important to identify important domains where the ratings must be excellent for use. The author of the SAM (26), specifically identified literacy demand and the cultural appropriateness as domains of materials which must have excellent rating by the target users (36). Indeed, in our study, we found these two domains to have excellent content validity for the three materials. Studies by De Oliveira in Brazil for on materials for health eating by pregnant

women and Sousa et al., study in Portugal for postoperative orthographic educational material also found these domain ratings as excellent. This consideration for the literacy of end users in educational materials is set at fifth grade (37). Fifth grade is Primary 6 in Nigeria.

The evaluation of materials by the end users is as important as that of the experts. If the target users find materials not suitable the process of expert validation could be a waste (38) (21), because the materials are made for the consumption of the users. Experts focus on the technical construct and the communication of the content of the materials while the comprehensibility and cultural appropriateness are the domains of concern for clients (21). In our study, majority of the end users rated all the three material as having superior content. There is a superior rating of all the materials among experts and users with the use of the SAM. No study has actually compared the rating of the two groups of participants (experts and users). In our study, the domains of content, literacy demand and cultural appropriateness are well acceptable and rated as superior among the majority of the clients regardless of their educational background, occupation or age. They made no suggestion for improvement. Findings in the study of (21) also shows that the language of the content satisfied the target users but was not satisfactory to the experts, hence the authors complied with the users' decision.

The translated version of SAM for this study has a good reliability value of  $> 0.7$  Cronbach alpha coefficient value reliability for poster and leaflet. This is similar to the Chinese translated version of the SAM of Cronbach alpha  $> 0.8$  (24). However, we experienced challenges in direct translation of words which include topography and layout into Yoruba language. To address such challenge, all the translation experts decided that such words be translated with an explanation which will get the same response that the English version will get. The Chinese translated version of SAM has similar challenges, "total possible score" had a back-translation of "adjusted total possible score" but the word could only be reviewed to the closest meaning. The Swedish SAM translation found satisfaction with translators but could not satisfy the users (29). A study which had no translated SAM into Portugal utilized focus group discussion to achieve evaluation of materials among patients (39).

Our study has some limitations. All print educational materials are expected to reach the readability level of fifth grade educational qualification (37). Majority (76%) of our clients had post-secondary education (post ninth grade) and it is possible that our participants over rated the materials as readable. However, the Yoruba and pidgin translated versions of the materials have taken care of the low literate people. The materials were developed with the involvement of maternal- child health clients with fifth to ninth grade.

## Conclusions

Our study found that the poster, leaflet and song educational materials on maternal depression have excellent content validity. This study produced Yoruba language translated Suitability Assessment of Materials (SAM) which has good internal consistence for poster and leaflet. These materials can therefore be recommended for use in maternal child health clinics for educating clients. Researchers

intending to develop educational materials in Africa can leverage this validation process for developing locally relevant materials

## Abbreviations

SAM

Suitability Assessment Materials

I-CVI

Item level- Content Validity Index or Scale level- Content Validity Index

S-CVI/Ave

Scale level – Content Validity Index/ Average

S-CVI/UA

Scale level – Content Validity Index/Universal Agreement

## Declarations

**Ethical approval and consent to participate:** Ethical approval was obtained from the Oyo state ethical review board, ref no AD 13/479/2016. The consents of the models used for the images are also available on request.

**Consent for publication:** Not applicable.

**Availability of data and material:** All data generated or analyzed during this study are included in this article as its supplementary information files.

**Competing interests:** All authors declared no conflict of interest is attached to this study.

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**Authors' contribution** A.O and G jointly drafted the paper, revised the analysis, and revised the manuscript.

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## Tables

Table 1 Sociodemographic characteristics of experts for content validation of maternal depression educational materials.

<b>characteristics of respondents</b>	N-16	%
<b>Mean age</b>	41.6±7.2	
<b>Age range in years</b>		
<40	9	50
<40	9	50
Total	18	100.0
<b>Educational qualification</b>		
B.ED <sup>1</sup>	1	5.6
FWACS <sup>2</sup>	1	5.6
MBBS <sup>3</sup>	3	16.7
MPH <sup>4</sup>	4	22.2
MSC <sup>5</sup>	5	27.8
RN <sup>6</sup>	4	22.2
Total	18	100.0
<b>Profession</b>		
Mental health	3	16.6
Child health	3	16.6
mental health	3	16.6
Public health	3	16.6
Health promotion	3	16.6
Maternal child health matron	3	16.6
Total	18	100.0
<b>Marital status</b>		
married	16	88.9
widowed	1	5.6
single	1	5.6
Total	18	100.0
<b>Working experience</b>		

3-5yrs	2	11.1
6-9yrs	2	11.1
>10 yrs	14	77.8
Total	18	100.0
<b>Work type</b>		
Health workers	16	88.9
Lecturer	2	11.1
Total	18	100.0
<b>Tribe</b>		
Yoruba	17	94.4
Ibo	1	5.6
Total	18	100.0
<b>Religion</b>		
Christianity	18	100.0

RN<sup>6</sup>-Registered Nurse, FWAPC<sup>2</sup>-Fellow West Africa College of Physician (FWACP) West Africa Psychiatry College,

BED<sup>1</sup>-Bachelor of Education, MPH<sup>4</sup>- Master of Public Health, MSc<sup>5</sup>-Master of Science, MBBS<sup>3</sup>: Bachelor of Medicine and Surgery

Table2 Item content validity index of materials from experts' rating

<b>Materials/SAM domains</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>A</b>	<b>B</b>	<b>I-CVI=A/B</b>
<b>Experts</b>									
<b>LEAFLET</b>									
Content	x	x	x	x	x	x	6	6	1
Literacy demand	x	x	x	x	x	x	6	6	1
Graphics	x	x	x	x	x	x	6	6	1
Layout and topography	x		x	x	x	x	5	6	0.83
Learning simulation	x	x	x	x	x	x	6	6	1
Cultural appropriateness	x	x	x	x	x	x	6	6	1
Total							34	36	0.94
<b>S-CVI/UA=No of I-CVI =1/Total no of I-CVI</b>									0.83
<b>POSTER</b>									
Content	x	x	x	x	x	x	6	6	1
Literacy demand	x	x	x	x	x	x	6	6	1
Graphics	x	x	x	x	x	x	6	6	1
Layout and topography	x	x	x	x		x	5	6	0.83
Learning simulation	x	x	x	x	x	x	6	6	1
Cultural appropriateness	x	x	x	x	x	x	6	6	1
Total							34	36	0.94
<b>S-CVI/UA</b>									0.83
<b>SONG</b>									
Content	x	x	x	x	x	x	6	6	1
Literacy demand	x	x	x	x	x	x	6	6	1
Learning simulation	x	x	x	x	x	x	6	6	1
Cultural appropriateness	x	x	x	x	x	x	6	6	1
Total							24	24	1

S-CVI/UA=I-CVI rated 1/total no of items. A is the no of experts who rated material as adequate. B is the total number of experts

Table 3 Sociodemographic characteristics of maternal-child health clients who evaluated maternal depression educational materials.

Socio demographic characteristics of respondents	Participants		Participants		Participants	
	for poster assessment N(50) %		for leaflet assessment N (50) %		for song assessment N (50) %	
<b>Mean age in years</b>	30.7±5.4		31.3±5.2		29.0±5.1	
<b>Age range in years</b>						
20-30	31	62.0	25	50.0	32	64
31-49	19	38.0	25	50.0	18	36
Total	50	100.0	50	100.0	50	100
<b>Category of women</b>						
Pregnant	25	50.0	25	50.0	25	50.0
Nursing mother	25	50.0	25	50.0	25	50.0
Total	50	100.0	50	100	50	100
<b>Religion</b>						
Christianity	24	48.0	24	48.0	26	52.0
Islam	26	52.0	26	52.0	24	48.0
Total	50	100.0	50	100	50	100
<b>Highest level of education</b>						
<Secondary school	12	24.0	20	40.0	22	44.0
>Secondary school	38	76.0	30	60.0	28	56.0
Total	50	100	50	100	50	100
<b>Occupation</b>						
Non Civil servant	30	62.0	34	68.0	31	62
Civil servant	19	38.0	16	32.0	19	38
Total	50	100	50	100	50	100
<b>Ethnic group</b>						
Yoruba	50	100.0	43	86.0	44	88.0
Non Yoruba	0	0	07	14.0	06	12.0
Total	50	100	50	100	50	100

## Figures

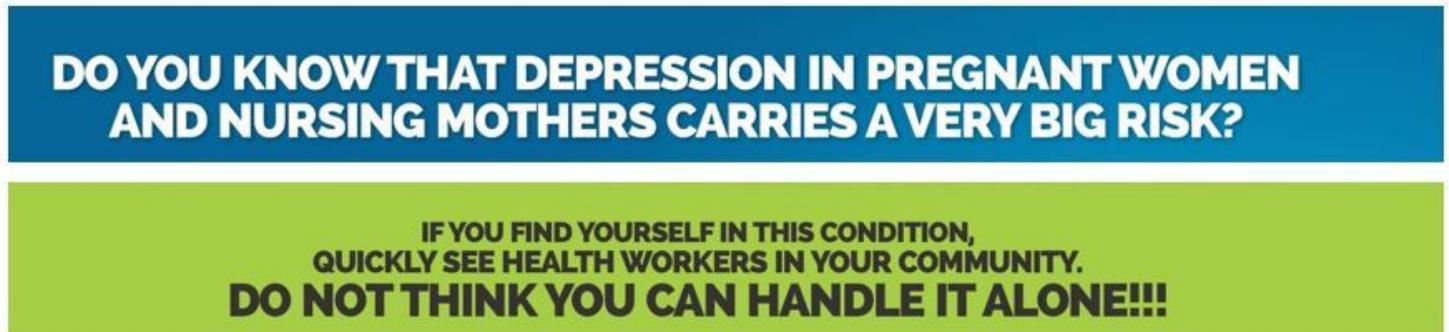


Figure 1

Poster Figure 1 is a poster content on maternal depression which had its images removed. The blue background print is the title and the green background print is in the body of the poster.

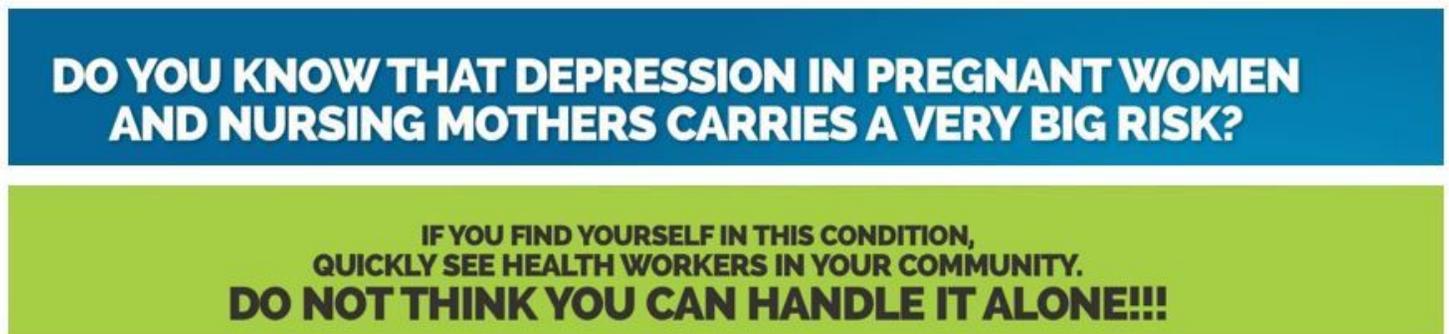


Figure 1

Poster Figure 1 is a poster content on maternal depression which had its images removed. The blue background print is the title and the green background print is in the body of the poster.

SIGNS & SYMPTOMS	CONSEQUENCES OF DEPRESSION IN PREGNANCY	MATERNAL DEPRESSION IS...
<p>ANY TWO FROM THE FIRST THREE AND ANY OTHER THREE OR MORE, LASTING FOR TWO WEEKS</p> <ul style="list-style-type: none"> <li style="background-color: #e91e63; color: white; border-radius: 50%; padding: 10px; width: 30%;">You will lose interest in the things you enjoyed doing</li> <li style="background-color: #8d6e63; color: white; border-radius: 50%; padding: 10px; width: 30%;">You will have low mood</li> <li style="background-color: #e67e22; color: white; border-radius: 50%; padding: 10px; width: 30%;">You will have fatigue and low energy.</li> </ul> <p>You will lose your joy</p> <p>You will lose appetite or eating too much.</p> <p>Your sleep will be breaking or you may find it difficult to get out of bed.</p> <p>You will be feeling pains and aches.</p> <p>You will be thinking back into the past.</p> <p>You will be crying.</p> <p>You will be irritable.</p> <p>You will be losing concentration.</p> <p>You will be feeling like keeping to yourself.</p> <p>You will be feeling hopeless.</p> <p>You will be feeling guilty or worthless</p> <p>You will be blaming yourself</p> <p>You will be having recurrent thought of death or self-harm or to harm child</p>	<p>FOR SUCH A PREGNANT WOMAN:</p> <ul style="list-style-type: none"> <li>• She may have raised Blood Pressure</li> <li>• Her baby may not grow well in the womb</li> <li>• She may deliver a low birth weight baby</li> <li>• She may have premature delivery</li> <li>• She may have shock in pregnancy</li> </ul> <p><b>CONSEQUENCES OF DEPRESSION AFTER DELIVERY</b></p> <ul style="list-style-type: none"> <li>• She may not be able to function well as mother and wife</li> <li>• It may disrupt the bond between she and her child because you will not feel like carrying the baby</li> <li>• It may not allow her child to grow well because of neglect and underfeeding</li> <li>• It may impair your child's emotional development</li> <li>• It may disrupt relationship between she and her partner</li> <li>• She may commit suicide or kill her own child</li> </ul>	<p><b>MATERNAL DEPRESSION IS...</b></p> <p>A state of low mood and strong feeling of loss of interest in activities, this can affect a person's thoughts, behavior, feelings and sense of well-being experienced by women during pregnancy and after giving birth" (Diagnostic and Statistical Manual, DSMS 2013)</p> <p>The way any part of the body like eyes, ear, mouth, brain, bone, kneel, heart and so on can be in a state of ill health, the same way the mind can experience ill health.</p> <p>It can happen to any human being and it can be very bad in its effect. It is worse for pregnant woman and nursing mother because pregnant woman and nursing mother have to care for a whole new human being who is helpless, in addition to their usual role as wives and mothers.</p> <p>NOTE! It is not normal with pregnancy.</p>

Figure 2

Leaflet page 1 Figure 2 is the content of leaflet on maternal depression on its front page. It shows the definition, symptoms and consequences of maternal depression.

SIGNS & SYMPTOMS	CONSEQUENCES OF DEPRESSION IN PREGNANCY	MATERNAL DEPRESSION IS...
<p>ANY TWO FROM THE FIRST THREE AND ANY OTHER THREE OR MORE, LASTING FOR TWO WEEKS</p> <div style="display: flex; justify-content: space-around;"> <div style="background-color: #e91e63; color: white; border-radius: 50%; padding: 10px; width: 30%;">You will lose interest in the things you enjoyed doing</div> <div style="background-color: #8d6e63; color: white; border-radius: 50%; padding: 10px; width: 30%;">You will have low mood</div> <div style="background-color: #e67e22; color: white; border-radius: 50%; padding: 10px; width: 30%;">You will have fatigue and low energy.</div> </div> <p>You will lose your joy</p> <p>You will lose appetite or eating too much.</p> <p>Your sleep will be breaking or you may find it difficult to get out of bed.</p> <p>You will be feeling pains and aches.</p> <p>You will be thinking back into the past.</p> <p>You will be crying.</p> <p>You will be irritable.</p> <p>You will be losing concentration.</p> <p>You will be feeling like keeping to yourself.</p> <p>You will be feeling hopeless.</p> <p>You will be feeling guilty or worthless</p> <p>You will be blaming yourself</p> <p>You will be having recurrent thought of death or self-harm or to harm child</p>	<p>FOR SUCH A PREGNANT WOMAN:</p> <ul style="list-style-type: none"> <li>• She may have raised Blood Pressure</li> <li>• Her baby may not grow well in the womb</li> <li>• She may deliver a low birth weight baby</li> <li>• She may have premature delivery</li> <li>• She may have shock in pregnancy</li> </ul> <div style="background-color: #8d6e63; color: white; padding: 5px; text-align: center;"> <b>CONSEQUENCES OF DEPRESSION AFTER DELIVERY</b> </div> <ul style="list-style-type: none"> <li>• She may not be able to function well as mother and wife</li> <li>• It may disrupt the bond between she and her child because you will not feel like carrying the baby</li> <li>• It may not allow her child to grow well because of neglect and underfeeding</li> <li>• It may impair your child's emotional development</li> <li>• It may disrupt relationship between she and her partner</li> <li>• She may commit suicide or kill her own child</li> </ul>	<p>A state of low mood and strong feeling of loss of interest in activities, this can affect a person's thoughts, behavior, feelings and sense of well-being experienced by women during pregnancy and after giving birth" (Diagnostic and Statistical Manual, DSM5 2013)</p> <p>The way any part of the body like eyes, ear, mouth, brain, bone, kneel, heart and so on can be in a state of ill health, the same way the mind can experience ill health.</p> <p>It can happen to any human being and it can be very bad in its effect. It is worse for pregnant woman and nursing mother because pregnant woman and nursing mother have to care for a whole new human being who is helpless, in addition to their usual role as wives and mothers.</p> <p>NOTE! It is not normal with pregnancy.</p>

Figure 2

Leaflet page 1 Figure 2 is the content of leaflet on maternal depression on its front page. It shows the definition, symptoms and consequences of maternal depression.

## PREVENTING AND TAKING CONTROL OF YOUR DEPRESSION

- Depression often makes you feel helpless. Take action!!!! Making yourself feel more in control will have a positive effect.
- Forgive and resolve conflicts
- Think well about yourself. The way you think about yourself will affect your frame of mind and feelings of depression.
- Doing something that you are interested in, enjoy or good at.
- Take right decision on time or seek help to take your decision (indecision can fuel depression)
- Finish up your task on time or seek help to finish on time (procrastination can make work to be overwhelming, cause non-accomplishment, low self-esteem and depression)  
Going for daily walks
- Attend occasion like wedding, naming ceremony, party and religious activities
- Keep in touch with friends and family
- Eating healthy will help you generally feel better and give you more energy, especially if you are also exercising
- Get help from health workers
- Commit all your ways unto God (man proposes God disposes)

Figure 3

leaflet page 2 Figure 3 is the content of back page of leaflet on maternal depression with images removed. It shows how to prevent and to take control of depression.

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## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplTable1.docx](#)
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- [NOIDENTITYEXPERTSSONGRATING.xlsx](#)
- [NOIDENTITYEXPERTSSONGRATING.xlsx](#)
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- [NOIDENTITYEXPERTSLEAFLETRATING.xlsx](#)
- [INTERRATERANDINTERCLASSDATA.xlsx](#)
- [INTERRATERANDINTERCLASSDATA.xlsx](#)