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Development of an Instrument for Measuring Women's Multi-Dimensional Attitudes towards Menopause

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Abstract
The study was undertaken to develop and validate an instrument for measuring cognitive, affective and behavioural aspects of attitudes of women toward menopause. The sample size for the study was 610 women from three Local Government Areas of Enugu in Nigeria. Models within Item Response Theory and Classical Test Theory were used for calibrating the subscales.
Analysis of the study indicate that the final three subscales of 33 item met standards for internal reliability, content validity, construct validity, criterion validity and convergent validity. This provides preliminary evidence to guarantee further use of this instrument for the purpose of measuring women's attitudes toward menopause.

Key words: Instrument, attitude, cognitive, affective, behavioural, item response theory, classical test theory, menopause, women.

1. Introduction

Nature has made it that menstruation starts and ends at a particular time in the life of any normal woman. This end of menstruation is what many authors describe as menopause (Meredith, 2005; Rousseau, 2007; Fadday, 2008). It is a necessary stage that all adult females at mid-life must go through (Dillaway, 2005). According to National Institute on Ageing (1992), menopause is the point in woman's life when menstruation stops permanently, signifying the end of her ability to have children. This is known as "Change of life". Menopause is a gradual biological process in which the ovaries reduce the production of female sex hormone. In other words, menopause is concerned with the end of possible sexual reproduction evidenced by the cessation of menstruation period and prevention of pregnancy. Buchbeum (2000) had observed that the aim of menopause occurrence is to preserve the life of women from late pregnancies and to enable them contribute effectively to the development of their family and the nation as a whole. Similarly, Lesherz & French (2000) stated that changes in the life of women are to ensure them maximum contribution in nations building after their procreation ceased.
Menopause results to the women experiencing different symptoms, such as amenorrhea, hot flushes, virginal dryness, falling and dryness of the breast, dyspareunia, wrinkling of the skin, depression (Okoye, 2007). Many women, however, wonder if these changes are normal and many get confused about how to treat the symptoms, yet it appears to be a matter of personal choice that depends on ones deposition. This disposition could be as a result of societal value or the social status assigned to aged women. Although, all females go through this period at the middle adulthood (45-55yrs) as part of ageing process, their reactions to the physical symptoms are not the same. These reactions are termed attitudes. Attitude is mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon individual's response to all objects and situation with which it is related (Allport, 1977). According to Suzanne and Brenda (2000) attitude is feeling based on a person's impression on an event or object. Similarly, Morgan (2000) stated that attitude is a way of feeling, thinking and behaving toward an object or an event or idea. It is a learned predisposition on the part of an individual to respond positively or

negatively to some object or situation. This response of an individual to the situation depends on how much he/she likes or dislikes the event or situation. It is this response to an event that hurt most and not the event itself; an event that energizes one may depress or lead to illness in another. Therefore, the thought of menopause by women may energize, depresses or lead to illness. This is likely because attitude influences actions and conducts which in turn influence life pattern and health.

Researchers over the years have concluded that women attitudes are one of the crucial variables in the success of management of menopause (Chow& Wineer, 1992, Hayes & Gunn, 1998: William & Algozine, 1977). These attitudes can create positive or negative expectations and behaviours which facilitate or limit the successful management of menopause It is important to obtain an accurate picture of women's attitudes toward menopause as these attitudes are predictors of successful management of menopause of women of different ages, parity, educational qualification etc (Faddy,2000). An understanding of these attitudes is essential for curriculum planning of health instructions/ programmes of primary health services and could have a significant impact on current and future health policy, programme planning and funding decision. Research concerning attitudinal barriers to management of menopause requires psychometrically sound instruments that will allow researchers, health practitioners and policy makers to respond to factors that may facilitate or hinder the formation and modification of attitude toward menopause.

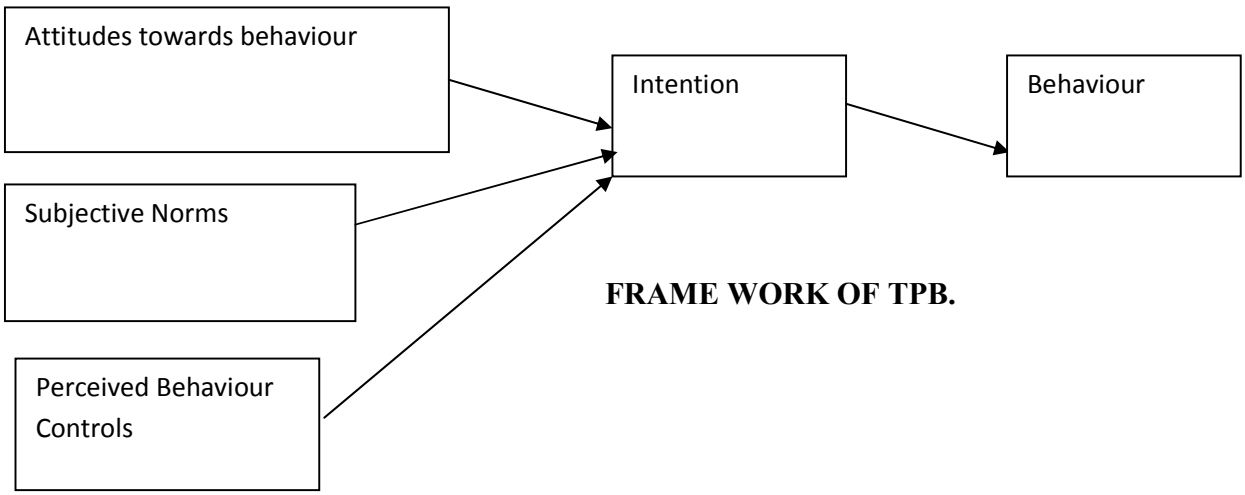
While most attitudinal instruments were designed for research situations and used only once a number of attitudinal instruments in health education have some psychometric characteristics that other researchers have not deemed sufficient enough to justify further use ((Sommer, Avis, Meyer, Ory & Madden, 1999; Shea 2006) This is because, either the, psychometric properties of the attitude's instruments have not been reported fully or the instrument have psychometric properties that are somewhat unclear. For instance, Reynolds & Greco (1980) failed to report on the characteristics of the items and scales when calibrating the educational attitude survey. In the case of attitude toward mainstreaming scale the psychometric properties are unclear as different factorial structures were found on a number of occasions (Berryman & Neal 1980). This lack of evidence of psychometric adequacy raises concerns for the validity and reliability of some of the instruments.

Also, a majority of attitudinal instrument measures a single dimension of attitudes particularly the cognitive aspects of attitude (.e.g. Cooke, 2003; Maturitas, 2005; Seth & Pitllin, 2000). In a review of attitude scale only two studies were found to have employed the cognitive, affective and behavioral aspects of attitudes to measure attribute toward health service (Mahat, 2007). . While a number of studies have attempted to include one or the other this study extends previous research and contributes to further understanding of the theoretiscal nature and structure of attitudes and the knowledge base for the provision of primary health care particularly now the Primary Health Services is a global phenomenon that cannot be neglected (Avramidis Bayliss &Purdin 2000)

Therefore, the purpose of this study was to develop multi- dimensional instrument that could effectively measure cognitive, affective and behavioural aspects of attitudes of women towards menopause within the realm of health services.

2.Theoretical frame work

The study is based on the Theory of Planned Behaviour (TPB) which is an extension of the original Theory of Reasoned Action (TRA) and incorporates perceived control over behaviour as an additional aggregate of intention (Ajzen, 1985). The theory of planned behaviour (TPB) provides a frame work for understanding the effects of factors such as relationships between attitudes toward behaviours, normative belief, perceived behavioural control, intention and behaviour. According to the theory, the most important determinant of a person's behaviour is behaviour intent and it specifically puts forwards three conceptually independent determinants of intentions, that is, attitudes toward the behavior, subjective norms and the degree of perceived behaviour control (Ajzen, 1991). In line with the theory of planned behavior, this study postulates that the formation of intentions is influenced by multidimensional attitudes toward the behavior, perceived social pressure to perform or not to perform the behaviour (subjective norms) and perceived ease or difficulty of performing the behavior (perceived behaviour control) reflected by previous experience and knowledge and newly acquired knowledge. The more favourable the attitudes and subjective norms with respect to behavior, and the greater the perceived control behavior, the stronger should be the individual's intention to perform the behaviour. This will provide useful information in understanding women's behaviours towards menopause and for the implementation of intervention strategies in primary health services to effectively change these behaviours.



FRAME WORK OF TPB.

3. Method

3.1 Sample.

A stratified random sampling method was employed to select a sample of three local government areas in Enugu State, Nigeria.

The target group was child –bearing women in three local government area of Enugu state, Nigeria namely Igbo-Etiti, Nsuka and Uzo-uwani local government areas. The sample was made up of 157 women from Igbo –Etiti, 323 from Nsukka and 130 from Uzo-Uwani, given a total of 610 women who participated in the study. Questionnaires equal to the number of the women were distributed with the assistance of health workers in the primary health centre of these local government areas.

3.2. Development of the Instrument.

In developing the questionnaire, the researchers made use of the measurement frame works described by De Vellis (2003) and Wilson (2005). The measurement frame work provided a systematic way of developing the questionnaire and is based on a merging of both theoretical and psychometric approaches to scale development. The development of the attitudes instrument, within this measurement frame work was guided by the following criteria:

- *Brevity – administration will not be a deterrent for its use*
- *Ease of Administration – requiring no extensive instruction or trained examiners*
- *Flexibility- for use with different groups of women*
- *Valid – Provide sufficient evidence of validity*
- *Reliable – Provide sufficient evidence of reliability*

The development of the attitudes towards menopause construct involves stating the research aims and objectives, review of literature and consultation of other instrumentation used to measure attitudes. In this study attitudes were seen as multidimensional consisting of affective, cognitive and behavioural.

In transforming the theoretical frame work into a number of statements more than 60 items were constructed based on a synthesis of previous research focusing on women attitudes towards menopause. Many of these items were eliminated because of their ambiguity and their similarity with other items. The responses to the items were subjected to factor analysis using three factors Varimax rotation method. A pool of 50 items was initially chosen to fit across the three dimensions of attitudes cognitive, affective and behaviour attitudes.. The items were grouped according to the relative strength needed to agree with them

In this study a likert type scale was used as response indicator format for measurement. The likert types scale is regarded as a simpler form of data collection that acknowledges that the questions require expressed opinions (Bond & Fox, 2001). The respondents were asked to rate each item on a point rating scale of strongly agree, agree, disagree, and strongly disagree. The researchers asked a group of experts knowledgeable in the health area to review the item pool. Two experts in measurement and evaluation were requested to review the content and structure of items and questionnaire. Following the feedback, a number of items were rewritten to ensure clarity. The amended

questionnaire was then given to a group of 50 women from one health district consisting of those who have experienced menopause and those yet to experience menopause. The women were asked to complete the questionnaire, providing comments on the clarity of the items and how the questionnaire might be improved. There was no specific pattern to the errors identified indicating that there was no significant fault in the design of any single item that may cause respondent's errors.

The instrument, Multi- dimensional Attitudes Menopause Scale (MAMES) consisted of 50 items inquiring about women's attitude towards menopause. 19 item within the cognitive dimension of attitudes reflect women's perceptions and beliefs about menopause; 17 items within the affective dimensions of attitudes represent women's feelings and emotions associated with menopause while 14 items of behaviours intent and that imply women intention to act in a certain manner towards menopause. The response continuum was revised for some of the items

However, in the past, most instruments measuring attitudes have been calibrated using classical test theory (CTT) and procedure. Hambleton and Swaminathan (2004) identified a number of shortenings of classical test theory and related models and practices that make them not suitable for more of the demands being placed on measurement models today. Item response theory (IRT) came up in response to some of the short comings of CTT. IRT is a family of model that describe the interaction between examinees and items using probabilities models. Item response theory facilitates the development of a construct theory and interpretation of levels of attitudes by providing item and respondent location on the variable.

However, it has been argued that CTT continues to be an important frame work for the construction of items (Bechger, Manis, Verstralen & Beguin, 2003). In calibrating the attitudes instrument for this study the measurement model used were located within IRT and CTT. These provided different dimensions of information and hence add valuable information about the validity and reliability of the instrument.

3.3. *Data Analysis.*

The analysis of the data consisted of three stages in order to locate respondents and items responses on the construct map. A model within IRT known as the Multi dimensional random coefficients multinomial logits model (MRCML) was employed (Adams, Wilson & Wang, 1997). Firstly, items were removed if the analysis of fit does not conform to the model. Secondly stage requires factor analysis within CTT which was utilized to identify the relationship to the underlying variable. That is, items with high factor loadings were retained. Finally, analyses of reliability and validity within items and subscales were reported using a combination of model within both theories.

In evaluating the items, analyses were conducted using Statistical Package for Social Sciences (SPSS) and ConQuest Computer Programme (Wu, Adams, & Wilson, 1998) Items were also analyzed using fit analysis through the INFIT and OUTFIT mean square statistics (Wright & Masters, 1982) and coefficient of internal consistency index was determined using Cronbach Alpha. Those items that contributed least to the overall internal consistency were considered for amendment. In arriving at the final scale given all circumstances, the analysis of each item was both theory driven and data driven.

4. RESULTS

An initial exploratory factor analysis was carried out to detect the dimensionality of the instrument or items. The initial analysis found that 50 items were identified. Although the screen plot suggested the presence of one single dominant factor, it also provided evidence of other factors in the data. Similarly an IRT calibration of all the items revealed that at least 17 items showed a lack of relationship with a one-dimensional variable. In all, the analyses indicate that the individual subscales measure distinct dimension of women attitudes and suggest that a total score on the whole instrument would be inappropriate. Both item response modeling and confirmatory factor analysis were adopted to follow up this initial exploration of data. Since all the items used the same four response categories – strongly agree to strongly disagree, both the rating scale and partial credit models were available within MRCML (Morgan, 2000). The rating scale model assumes that respondents will use the four categories consistently with all the items while the partial credit model is used if respondent's interpretations and uses of the categories were not consistent across all items. To decide between the model used in this study the deviance and parameter of both models were examined. In item response modeling, the fit of the model to the data is used to predict response pattern to all the items by all women. Where the data are shown to misfit, it indicates that the items data needs to be examined and in most cases, the item is removed from the scale. The Infit mean square (Infit MS) unit gives a measures of items fit to the IRT model of the variable against which it is calibrated and a range of 0.77 to 1.30 was selected to indicate item fit (Wright & Masters). Items with an Infit of 1.00 show acceptable fit to the model.

Items with a fit below 0.77 portray patterns of deterministic behaviour in the variable content that there is dependence on another items or that there is redundancy in the scale. Items with fit greater than 1.30 show patterns

of randomness or items that all or perhaps none of the women agrees with. Fit indices indicated that 10 items lie outside the range. An inspection of the items gives rise to a decision to delete 10 of the items. Item with an infit greater 1.30 but less than 1.40 were retained which is still an acceptable assessment of items in rating scale (Wright & Linacre, 1994). The revised scale of 40 items was subjected to confirmatory factor analysis. Consistent with the prevailing conceptualization of women attitudes, three factors were retained and rotated orthogonally as well as obliquely. The factors were found to be correlated; hence the oblique solution using a promax rotation was used for further analysis. An investigation of the both the pattern and structure matrices gave rise to a decision to keep items that are loaded on at least 0.35 and above on one factor. This pattern coefficient for these items reflects a direct path from the factor to a variable when the influence of the other variable is partial out. As the components are correlated, sums of squared loadings cannot be summed to get a total variance. The final instrument had 33 items within each subscale. The factor loadings for each
Item are provided in table 1.

All items fit within the range of 0.77 to 1.30 and had factor loadings equal or greater than 0.35. Table 1 also provides the logit and fit values for each item. In IRT, the items and respondents are placed along the same latent variables using location measures in units called logits. Negative logit value indicate that the items are easier to agree with the women's estimates that represent women who are less positive about the menopause. Positive logit values show items that are harder to agree with and women who are more positive about menopause.

Reliability estimate given in table 2 indicate the extent to which location measuring can be separated along the variable given their error estimates. The possible range of separation indices ranges from 0.0 to 1.0. Item separation indices value of 0 indicate that all the items are located at the same position on the variable and there is a complete redundancy in the items capacities to measure agreement, while a value of 1.0 indicates that the items are completely separated along the variable and each contributes unique amount to the interpretation of the variable. This was referred to as index of construct validity (Wright & Masters, 1982). Also the women separation index value of 1.0 indicates the extent to which the subscale can discriminate between women agreement levels on the variable. This would be interpreted as an index of criterion validity. Therefore, the data in table 2 shows that the items separation index values were approaching 1.0 for each of the subscales, showing that the items are well separated along the variable being measured and woman separation index provided sufficient evidence of the capacity of the subscale to discriminate between different levels of women attitudes. This Cronbach reliability for each subscale indicates internal consistency of the items.

Table 3 above indicates that the subscales consequently form constructs. The convariation between the subscales showed positive correlations because the response continuum was revised for a number of items. There was a medium positive correlation between cognitive and behavioral and between affective and behavioural while there was little high positive correlation between cognitive and affective. This implies that a high level of one dimension of attitudes is associated with high level of another dimension of attitudes. The implication of this is that positive cognitive and affective dimensions are associated with behavioural intentions towards menopause.
In table 3, the co variation between the subscales indicated positive correlation. This implies that women who hold positive cognitive and affective would demonstrate behaviours that indicate acceptance of menopause as natural phenomenon while women who hold negative attitude would engage in behaviour that indicate non- acceptance of menopause as natural phenomenon. For instances, several studies have shown that behavioural intention is closely related to what the society thinks one should do (Nash, Edwards & Nebanier, 1993 . Hence, a woman who has favourable attitude towards menopause may behave in a manner that appears negative because the society or community in which she finds herself may regard menopause as indication of aging, non attractive and non productive. The items and women separation indices and internal consistency reliability of the subscales have provided substantial evidence of construct and criterion validity and reliability. Therefore, the measurement frame work, with early theoretical conceptualization, development of item pool and response data analysis and validation for the development of psychometric subscales are valid, reliable, stable and usable. Hence, a well- validated instrument of women's attitudes towards menopause is the impetus for fundamental improvement in primary health services.

5. **Conclusion**

The success of primary health policy depends on the cooperation and commitment of health workers who are directly involved in the counseling of women about menopause. This instrument provides evidence for such cooperation and commitment for the purpose of measuring women's attitudes towards menopause. Further study examining factors that affect women's attitudes towards menopause, may confirm the subscales as an instrument that record differences and shifts in attitudes. Such evidence may encourage further acceptance of the changes needed within the structure and organization of primary health systems for successful implementation of primary health services. The changes may range from increasing the adjustment of women of different ages in regular health education to providing an enabling health environment that will enable the health workers identify attitudes of women of different ages towards menopause for guidance on the management of symptoms of menopause.

6. Recommendation

Based on the findings of the study, the following recommendations were made. That the MAMES should be used by the officials of health Ministry who are involved with primary health care services.

That the instrument does discriminate and, therefore could be used for all cadres of women.

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Table 1: Mean item difficulty, item fit and factor loading of item.

	Item	**IRT**		**CTT**
NO		**Logits**	**Infit MS**	**Factor loadings**
	Cognitive			
1	I believe that menopause is a natural phenomenon found in every woman	-0.28	1.10	0.56
2	I believe that menopause is the physiological cessation of menstruation	-0.67	1.04	0.60
3	I believe that menstrual functions changes gradually towards menopause rather than ceasing abruptly	-0.08	1.11	0.57

4	I believe menopause occurs between the ages of 45-55 years	0.17	1.21	0.64
5	I believe that menopause is a symbolic marker of aging	0.59	1.06	0.64
6	Menopause is a mid-life change that generally does not require medical attention	0.45	0.84	0.42
7	Menopause is a period when women are no longer useful to the society	0.34	1.13	0.54
8	Menopause is a period when women gain respect in their families and communities	0.35	0.78	0.44
9	Menopause means end of youthfulness	0.72	0.81	0.61
10	Women at menopause lose their husband's attention, love and care	0.65	1.20	0.39
11	Menopause is a form of sickness and could be treated as such	0.56	1.08	0.65
12	Menopause librates women from bondages	0.13	0.94	0.54

13	I see menopause as a positive event of the life of a women	0.44	0.85	0.39
	Affective	**Logit**	**Infit Ms**	**Factor Loading**
14	I feel I will lose my womanhood as I expect menopause	-0.72	0.91	0.50
15	I get frustrated when I remember that menopause will occur	-0.64	1.22	0.64
16	I have mixed feelings towards the prospects of menopause	0.50	0.83	0.50
17	I am afraid of having menstruation symptoms similar to my mothers	0.46	0.92	0.49
18	I feel apprehensive about vaginal atrophy or dryness attributed to menopause symptoms.	0.30	1.13	0.53
19	I am uncomfortable with the feeling of moodness and depression attributed to menopausal symptoms	0.40	1.12	0.67
20	I feel worse about my self as I aged or experience menopause	0.51	0.79	0.65
21	I get irritated when my menopause stopped finally	0.47	0.86	0.50
22	I get frustrated when I have to adapt to the new demands of menopause.	0.35	1.10	0.35
23	I get upset if menopause starts before I have four children	0.34	1.05	0.47
	Behavioral	**Logits**	**Infit MS**	**Factor loading**
24	I will not discuss my experience of menopause with medical personnel	0.66	0.95	0.60

25	I will not adapt to changes in menopause	0.54	0.88	0.36
26	I get upset when menopause is mentioned in my discussion	0.21	1.03	0.50
27	I sympathize with women that experience menopause early	0.02	1.02	0.45
28	I am willing to advice women who have irritation during menopause	0.04	0.79	0.42
29	I will try to make my self attractive during menopause period	0.31	1.07	0.40
30	I am willing to adjust to the marital problems during menopause	0.21	1.09	0.38
31	I am willing to ensure that information given to me about menopause is followed	0.33	1.03	0.50
32	I keep my self busy to avoid remembering the	0.41	0.89	0.37
33	I am willing to adapt if the menopause is through surgical operation or illness	0.11	1.01	0.70

Table 2: Indices for items and women estimates on each subscale

subscale	**Item separation**	**Women separation**	**Cronbach alpha**
Affective	0.748	0.745	0.501
Cognitive	0.744	0.753	0.545
Behavioral	0.752	0.741	0.597

TABLE 3: Inter subscale correlation

	Cognitive	Affective	Behavioural
Cognitive	1.00		
Affective	0.633	1.00	
Behavioral	0.551	0.523	1.00