Quality of Field Antenatal Clinics Services Checklist: A Valid and Reliable Tool for Quality Improvement

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***ABSTRACT-** The aim of this study was to develop and validate an instrument to measure the quality of services of a field antenatal clinic in Sri Lanka. The major steps on development of the tool were focus group discussions, expert opinion, homogeneity and multifactor dimensionality. The antenatal clinics in the Kalutara District were listed out into two groups; estate clinics and others. A sample of ten field antenatal clinics was selected randomly from the Kalutara district in Sri Lanka. In each of these ten clinics, 90 women were randomly selected to be observed. The Factor analysis was performed with principal component analysis on exploratory factor analysis with Varimax rotation. The Factor analysis resulted in a six factor structure; interaction, promotion and protection, information and counseling, comprehensive care and linkage, continuity of care and technical competence. Judgmental validity was ensured for the developed tool with the experts' opinion and of which content validity was ensured by the process of tool development. Construct validity was ensured by factor analysis. Among six subscales, 3 (50%) subscales had a Cronbach's alpha of 0.7 or greater. A statistically significant difference was not observed between the two groups of observers on all 6 subscales on the services checklist. Quality of field antenatal clinics services checklist (QFANCSC) is a valid and reliable tool, which can be used in future to assess the quality of antenatal services.*

Key words - quality of field antenatal clinic services checklist, Sri Lanka, Quality assessment, antenatal care,

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1. INTRODUCTION

Improvement of quality requires measurement of quality and this requires valid and reliable tools [1-3] . Antenatal care in Sri Lanka is delivered at the field and at the institution level, through a well defined service network maintained by the Ministry of Health. The field antenatal clinics, as they are called in Sri Lanka, are different to the Primary Health Care centers, which are seen in other parts of the world as these clinics focus only on one of the essential elements of primary health, which is maternal and child health. Field antenatal clinics are conducted under the leadership of a Medical Officer of Health (MOH) and his team. The team consists of public health midwives and a public health nursing sister who provide services to the pregnant women attending these antenatal clinics.

To assess the services at a field antenatal clinic, a comprehensive quality assessment tool was not available in Sri Lanka. This shortcoming was noticed by the experts and was first taken up in 1995 [4] and again in 2002, in the Maternal Death Review. This lead to the Family Health Bureau having one of its coverage objectives as to improve the quality of antenatal services [5]. To assess the services at a field antenatal clinic, a comprehensive quality assessment tool is not yet available in Sri Lanka. The other developed and developing countries have developed their own tools for this purpose.

1.1 Identification of existing instruments

An Integrated Management of Pregnancy and Childbirth (IMPAC) programme, is a programme under the "Making pregnancy safe programme" aiming on preparation, monitoring and guidance to high-quality health services [6] where certain activities in the antenatal clinics such as anthropometric measurements, urine investigations for Albumin are not

focused upon. But these standards and guidelines were used in the present study with refinements to meet the Sri Lankan context. The WHO in the randomized controlled trial for the evaluation of a new antenatal care model (1996) used a tool "antenatal care content survey". This tool had items which were not applicable to our setting, such as the dental examination, screening and clinical laboratory tests, therapeutic interventions etc. The investigations are that a developing country like Sri Lanka would undertake at a tertiary care level such as Hepatitis B, Alpha feto protein, Glucose Tolerence test etc. This study was aimed keeping in mind the primary health care setting and therefore the WHO tool was found to be inappropriate to assess the quality of field antenatal clinics in Sri Lanka [7]. Srinivasa, et al. (1982) from India, developed a tool to assess quality of services in antenatal clinics of primary health care centers. The drawback was the quality which also encompasses components such as client provider interaction in relation to explanation, instructions etc have not been assessed. It was not clear if the tool had been validated nor was it clear on who observed the services and completes the checklist [8]. Structural attributes of quality were assessed through a checklist, and process attributes assessed through observation and exit interviews in a study in Tanzania on comparing the quality of public and the private antenatal clinics which are of a primary health care service center. The quality was measured against the national standards. The process of care was assessed in two components viz: the interpersonal aspects and the technical aspects. The physical infrastructure was assessed in four ways; toilets with water to flush, waiting places for all women, privacy of examination room, water to wash hands [9]. This tool was identified as suitable template to assess quality of facilities and services in Sri Lanka. The Bidan Delma Programme (2009) is a quality recognition programme where a self assessment tool was prepared to improve the quality performance of private sector midwives. This is implemented in Indonesia. The observation tool has sections namely midwife identification, physical setting and quality of clinical records. The physical facilities are very comprehensive with items compromising of building, chairs, consultation room, water etc. Although standards are not specified, the answers are categorized which reduces the observer bias.

A quality of service tool that has been extensively applied is the SERVQUAL model which has used the disconfirmation model. It relates to customer expectations and focuses more on a personal and emotional reactions to service [10].

Therefore, a standard field antenatal clinic quality assessment tool to assess the services and their standards was needed, specifically to enable the Ministry of Health in Sri Lanka to better prioritize their limited resources. The purpose of this study was to develop and validate an instrument to measure the quality of services of field antenatal clinics in Sri Lanka.

2. METHODOLOGY

2.1 Selection of items through focus group discussions

Two focus group discussions were used to identify new items for the instrument. One was with the Medical Officers concerned with maternal health in the field and the Medical Officers of Health (MOH), and the other with the Public Health Nursing Sisters and the Public Health Midwives. The focus group discussions were analyzed and the items discussed were listed out. Each item was then matched with an appropriate standard. This list had 158 items under 16 service stations which are the services and their activities in a field antenatal clinic. This list was sent to a group of experts who added or deleted items from the draft. These experts were academics specializing in the field of maternal health, and consultants from the Family Health Bureau at the Ministry of Health and Consultant Obstetricians. A modified Delphi technique, which was a "rotational Delphi", was used to reduce the fatigue on panelists and to increase the competencies [11]. This was used to prepare the initial draft and this was called the Quality of Services - Preliminary list I.

2.2 Formulation of response category for the services checklist

Adjectival scales were used to formulate responses. The responses of the observations were categorized and are shown in Table 1. The second and the third responses were included as it was found that although a particular service was available in the clinic, the activities under that particular service may not have been provided to a particular woman. For example, although the anthropometric services or immunization services were available to a woman in a clinic, the activity of informing the woman of her height or weight or the side effects of immunization may or may not have been provided.

2.3 Scoring of items and subscales for the services checklist

Weighting may have an effect if there are fewer than 40 items. The equation developed by Gulliksen in 1950 shows that if there are many items on the tool, there is no difference in their weighting [12]. If more than 40 items are found in a tool and if the items are weighted, it only adds to the complexity for the scorer with no other effect [13,14]. As this tool was a checklist with more than 40 items, it was decided not to weight them.

2.4 Improving the quality of the draft of the services checklist

The preliminary list was sent to the same experts to improve the quality of the draft. The use of ambiguity, double-barrelled questions, jargon, and value-laden words was examined, the necessary alterations were made, and the Quality of field antenatal clinics services checklist - initial draft was prepared.

2.5 Sample size

The study was conducted from January to March 2009 in the Kalutara District which is located south of the capital of Sri Lanka. The field antenatal clinics (ANCs) in the Kalutara District were listed out into two groups; the field ANCs in the estate sector and the field ANCs in the other sectors. A sample of ten field antenatal clinics was selected from the two sectors. A total of 900 pregnant women were observed in these ten field antenatal clinics. However the adequacy of the sample size was later confirmed on analysis with communalities and the degree of over-determination [15-17]. If the communalities were 0.6 or greater, the item was retained, confirming the adequacy of the sample size [16]. The degree of over-determination was confirmed, with none of the factors having fewer than three items [15].

2.6 Data collection

To minimize the bias in the information collected, the research assistants mingled around the clinic for about fifteen minutes. Although the health care workers knew the objectives and the aim of the study, they were not aware of the items in the study. The research assistants at a particular service station observed the services provided to the pregnant women in the clinics and completed the scores on the checklist. Ethical clearance was obtained from the Ethics Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka.

2.7 Data analysis

Inter-item correlation was assessed initially. Factor analysis with principal component extraction followed by Varimax rotation was used to discover the hidden factors. Varimax rotation, which is an orthogonal rotations was chosen as the factors were considered independent and the need for each variable to be associated with one factor, and for each factor to represent only a small number of variables [18,19] Internal consistency was investigated through Cronbach's Alpha, and inter-observer reliability was assessed with paired t test.

3. RESULTS

The preliminary tool had 158 items. With the modified Delphi technique, the items were reduced to 146. The mean inter-item correlation for the 146 items is shown on Table 2. The inter-item correlation was found to be between 0.2 and 0.8 for the majority of items. As it is recommended that the mean inter-item correlation should exceed 0.3, a mean inter-item correlation of 0.3 was chosen as the criteria to assess the suitability of items in the six subscales [20,21] Four of the subscales had a mean inter-item correlation of above 0.4.

An inter-correlational matrix of all items was calculated and principal component analysis was applied for the correlational matrix to identify the number of factors. The decision for the number of factors was based on the Eigen values and the Scree plot. The Eigen values which were greater than one were included and the Scree plot levelled off after six factors. However all items which had communalities which were less than 0.6 and with factor loadings less than 0.299 were removed from the tool. The six factors accounted for 66.9% of the variance. All six factors had a total of 104 items in the quality of field antenatal clinic services checklist (QFANCSC). The six factors identified, their percentage variance, and their labels were 'Client provider interaction' (25.5%), 'Promotion and protection of health' (11.2%), 'Technical competence of health care workers' (14.7%), 'Information and counselling' (6.5%), 'Continuity of care and follow up' (5.5%) and 'Comprehensiveness of care and linkages to other reproductive health services' (3.5%). The six factors were named according to the World Health Organization Safe Motherhood's quality of antenatal care categories [22].

3.1 Validity of the QFANCSC

As a validated gold standard measurement to assess the services checklist was not available, validity was measured by judgmental validation and construct validation [23]. The services checklist was validated by the same experts who had helped in developing the tool and therefore the judgmental validity for the services checklist was confirmed. Factor analysis confirms that the tool is validated for its constructs [24].

3.2 Reliability of the QFANCSC

As shown in Table 3, among six subscales, three (50%) subscales had a Cronbach's alpha of 0.7 or greater. Among the six subscales, as five subscales were above an alpha of 0.63, it was concluded that the quality of field antenatal clinic services checklist has good internal consistency.

The inter-observer reliability for the services checklist is shown in Table 4. A statistically significant difference was not observed between the two groups of observers on all six subscales on the services checklist. This confirms that the services checklist has good inter- observer reliability.

Table 1: Response and scores for the services checklist

Responses	Scores
Item is not appropriate to a particular woman	0
Service is not provided	1
Service is provided but the activity under that particular service is not provided	2
Activity is provided but it does not meet the standards	3
Activity is provided and it meets the standard	4

Table 2: Mean inter-item correlations for the subscales

Scale	No. of Items	Mean inter-item correlation
Subscale 1	28	0.78
Subscale 2	28	0.54
Subscale 3	22	0.48
Subscale 4	6	0.29
Subscale 5	8	0.79
Subscale 6	54	0.14

Table 3: Internal consistency of six factors

Scale	No. of items	Cronbach's alpha
Client Provider Interaction	22	0.96
Promotion and Protection of Health Subscale 2	21	0.95
Information and counseling	18	0.63
Continuity of care and follow up	6	0.50
Comprehensiveness of care and linkages to other	4	0.67
Technical competence of workers	35	0.86

Table 4: Inter-observer reliability of the services checklist

	Paired Differences				
	Mean	SD	t	df	Sig. (2 – tailed)
Client Provider Interaction	.20	2.25	.28	9	.79
Promotion and Protection of Health	3.60	7.76	1.47	9	.18
Information and counseling	-.30	2.21	-.43	9	.68
Comprehensiveness of care and linkages to other reproductive health services	2.30	3.13	2.32	9	.05
Continuity of care and follow up	-.10	1.73	-.18	9	.86
Technical competence of Health Care Workers	-.30	5.81	-.16	9	.87

4. DISCUSSION

The international studies on quality of antenatal care or antenatal clinics were more in the pretext of primary health care centers. To assess the quality of maternal programme a tool using homogeneity and multifactor analysis was developed by Mandel, et al. in the year 2004 [25]. However this tool was developed to assess all primary health care clinics and was thus not suitable for field antenatal clinics in Sri Lanka. The antenatal assessment score tool developed in the year 2003 in Saudi Arabia was recommended as a good audit tool to assess the quality of antenatal care [26]. This tool measures only the services in relation to the doctor which was thus not appropriate, as the public health midwives are the main service provider in the clinics in Sri Lanka. The WHO randomized controlled trial for the evaluation of the

new antenatal care model, developed a tool to measure the antenatal care content [27]. This tool was appropriate for a primary health care setting. It contained investigations of all degrees which were appropriate for tertiary health care setting in Sri Lanka rather than a field clinic. Thus in the present study, taking into consideration the problems, it was decided to develop a checklist to assess the quality of services in field antenatal clinics.

Observations give more information than other data collection techniques such as interviews or questionnaires [28]. Collecting observations on clinic activities is considered superior to using questionnaires or interviews [29]. Therefore it was appropriate that the quality of field antenatal clinic services checklist used observations for quality control.

On developing the tool, the first step was removing items with no variance [30]. The reason for no variance was either that the service was there in all the field antenatal clinics or the service was not provided in all field antenatal clinics. This is known as endorsement: when we can predict the response, or in other words cannot discriminate among field clinics [13]. One such case in the services checklist was the "stepping off the measurement scale".

Factor analysis with principal component analysis assisted the researcher in determining how many factors or dimensions were measured by the scale items. The most common and simple is the Kaiser rule. However it was not recommended by researchers as they demonstrate that with the Kaiser rule too many factors are retained [31]. The Scree test has now been recommended as the best method by many researchers, who give clear reasons why the Kaiser rule should not be the sole criteria to select factors for the principal component analysis [31,32].

This study used two ways to determine the number of factors: the Scree plot, and Eigen values greater than one. The services checklist identified six subscales from the Scree plot with Eigen values greater than one.

The items on the services checklist on factor analysis loaded onto six subscales which were named according to six of the 11 subscales in the WHO safe motherhood quality of care. For the services checklist, judgmental validity was ensured with the experts' opinions and content validity was ensured by the process of questionnaire development. Important issues were identified during the qualitative phase of focus group discussion, and with the experts' help. Further evidence of construct validity came from the outcome of the factor analysis and principal component analysis. Factor analysis showed that the subscales in the two tools assess different aspects of quality and contribute to the global measurement of quality, a finding which argues in favour of construct validity. The high Cronbach's alpha illustrates the reliability of the tool. Furthermore, reliability was demonstrated in this checklist with the inter-observer reliability.

The greatest advantage of this tool was that the instrument assesses the WHO safe motherhood elements on quality of care. No tool has assessed the quality of field antenatal clinics in terms of these elements. The WHO recommends that the process needs to be monitored for evaluation of quality of care. The other advantage in the use of QFANCSC is that the scoring system is easily understandable and could be filled in by any member of the health care team. The subscale scores do not have any statistical interpretations. These scores need only to be categorized into percentages which any health care worker could analyze or could easily understand when presented at local or monthly conferences.

With regards to clarity, the clarity would increase if the standards were there for a data collector or a supervisor to look through and decide on the score. The tools without standards could have lengthy procedures. These tools could vary according to the number of health care workers and the number of health centres [26]. The services checklist overcomes this disadvantage in that the time taken to fill in the tool did not vary and therefore did not depend on the number of health care workers or the number of field antenatal clinics.

However there were few limitations in the study. The cost of conducting a clinic nor the cost for a woman to attend the clinic were considered. A cost benefit study should be performed in the future. Social support and deprivation such as referrals for appropriate services and social support for different social classes were not observed.

5. CONCLUSION

Quality should be made another pillar of the health system [33]. It is not a luxury that only high income countries can afford, but making quality a pillar of the health system could be the answer to help Sri Lanka to achieve a low maternal mortality rate. This could be the solution for all developing countries like Sri Lanka. Improving quality of care with the help of the QFANCSC would ensure more effective use of limited resources which would ensure greater short term and long term benefits in maternal health care.

6.   ACKNOWLEDGEMENT

7.   REFERENCES

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