

Knowledge and perceptions of quality of obstetric and newborn care of local health providers: a cross-sectional study in three districts in Malawi

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Abstract

Aim

Quality of service delivery for maternal and newborn health in Malawi is influenced by human resource shortages and knowledge and care practices of the existing service providers. We assessed Malawian healthcare providers' knowledge of management of routine labour, emergency obstetric care and emergency newborn care; correlated knowledge with reported confidence and previous study or training; and measured perception of the care they provided.

Methods

This study formed part of a large-scale quality of care assessment in three districts (Kasungu, Lilongwe and Salima) of Malawi. Subjects were selected purposively by their role as providers of obstetric and newborn care during routine visits to health facilities by a research assistant. Research assistants introduced and supervised the self-completed questionnaire by the service providers. Respondents included 42 nurse midwives, 1 clinical officer, 4 medical assistants and 5 other staff. Of these, 37 were staff working in facilities providing Basic Emergency Obstetric Care (BEMOC) and 15 were from staff working in facilities providing Comprehensive Emergency Obstetric Care (CEMOC).

Results

Knowledge regarding management of routine labour was good (80% correct responses), but knowledge of correct monitoring during routine labour (35% correct) was not in keeping with internationally recognized good practice. Questions regarding emergency obstetric care were answered correctly by 70% of respondents with significant variation depending on clinicians' place of work. Knowledge of emergency newborn care was poor across all groups surveyed with 58% correct responses and high rates of potentially life-threatening responses from BEMOC facilities. Reported confidence and training had little impact on levels of knowledge. Staff in general reported perception of poor quality of care.

Conclusion

Serious deficiencies in providers' knowledge regarding monitoring during routine labour and management of emergency newborn care were documented. These may contribute to maternal and neonatal deaths in Malawi. The knowledge gap cannot be overcome by simply providing more training.

Introduction

Skilled attendance at delivery can prevent maternal and neonatal deaths¹. However simply increasing health facility deliveries may not have the desired impact if the quality of care provided is poor². Quality of care may be defined as 'the degree to which health services for individuals and populations increase the likelihood of desired outcomes and are consistent with current professional knowledge'³. Assessing quality of care is a complex process, which requires analysis of many elements of care, including

both the provision of care and the patients' experience of care. Frameworks for assessing quality of care have been developed and validated both for obstetrics⁴ and for paediatrics⁵. Such frameworks may be used to perform an all-round assessment of quality. Important determinants of quality of care include availability of resources, actual provision of care and patient satisfaction. Provision of care is a very human resource intense process and includes both, the availability of human resources and knowledge and motivation of the care providers.

The health sector in Malawi faces severe challenges in terms of both human and material resources⁶⁻⁸. This prevents delivery of even the most minimal and highly cost-effective Essential Health Package due to a lack of staff, frequent staff absences, poor knowledge and a lack of drugs⁷. A recent national survey points in particular to deficiencies in the quality of emergency obstetric care⁸. At the same time institutional deliveries have increased substantially from 57% between 1999-2004⁹ to 73% between 2004-2010. In 2010 the Maternal Mortality Ratio (MMR) was 675 per 100,000 live births⁶.

The study was designed to assess providers' knowledge of best practice in routine care and emergency situations, as well as to explore providers' perceptions of the care they provide, their confidence with key subject areas and the effect of training on their knowledge of these areas. The questionnaire was designed to identify the degree to which providers' knowledge, confidence and training might help to explain observed case fatality rates and to indicate areas where further training might be most beneficial.

Methods

The study was undertaken in rural health centres and urban or per-urban hospitals in Kasungu, Lilongwe and Salima, three districts in the central region of Malawi.

The areas assessed were as follows.:

1. Clinical care:

1A. Emergency obstetric care

1B. Monitoring and routine labour

1C. Emergency neonatal care

2. Providers' perceptions of the care they provide

3. Confidence and training

Questions on emergency obstetric and neonatal care were set as simple scenarios designed to be answered by clinical staff with basic knowledge of these areas. Questions were based on appropriate use of Basic and Comprehensive Emergency Obstetric Care (BEMOC and CEMOC) signal functions, as defined by UNICEF in 1997¹⁰ (Table 1), in keeping with the WHO guide 'Pregnancy, childbirth, postpartum and newborn care: a guide to essential practice'¹¹ and the Malawi Ministry of Health Manual of Integrated Maternal and Neonatal Care, 2009¹². Questions on monitoring and management of routine labour were set as multiple-choice questions, based on internationally recognized good practice¹³, and the Royal College of Obstetricians and Gynaecologists, United Kingdom (RCOG) list of effective procedures suitable for

audit¹⁴. Questions on attitudes and perceptions of care were designed to mirror the questions answered by patients as part of a 'Women-Friendly Care survey'¹⁵ pages 45, 180-1, 294 carried out by this group. Questions on confidence and training were added to put the above information into a training context. The questionnaires are reproduced in full as web appendix 1 (BEmOC questionnaire) and web appendix 2 (CEmOC questionnaire).

Table 1. Basic and Comprehensive Emergency Obstetric Care (BEmOC and CEmOC) signal functions, Adapted from [11]

	Basic EmOC	Comprehensive EmOC
Signal functions	Parenteral antibiotics Parenteral oxytocics Parenteral anti-convulsants and anti-hypertensives Manual removal of placenta Removal of retained products (MVA) Assisted vaginal delivery (forceps, vacuum extraction)	All 6 basic functions plus: Blood transfusion Cesarean section
Settings	Health centers Rural hospitals	Hospitals with an operating theater (OT) and surgical capacity
Skilled attendants	Midwives and nurses with midwifery skills Supporting staff	A team of doctors, clinical officers, midwives, nurses and supporting staff

Fifty-two clinical staff across Kasungu, Lilongwe and Salima health centres (BEmOC facilities) and hospitals (CEmOC facilities) were surveyed between December 2009 and March 2010. The sample was determined purposively: the health centres and hospitals were chosen via their inclusion in the larger MaiKhanda programme¹⁵, of which this study was a part; and participants were selected by their role as providers of clinical care and their availability during routine visits by research assistants. No subjects were excluded or refused to take part in the study. Subjects were given as much time as they needed to complete the questionnaire, oriented by a research assistant, who gathered all questionnaires for analysis. Data was entered into a Microsoft Excel database and analysis was done using SPSS. The analyses involved basic calculation of the percentage of staff who got each individual question correct and the calculation of average percentages of correct responses across each set of questions described above. Results were disaggregated facility type, amount of previous study and self-reported confidence in practice.

This study was a sub-study under a larger research programme, which was granted ethical approval by the National Health Sciences Research Committee (Protocol #420) of Malawi, based in Lilongwe.

Results

Of the 52 completed questionnaires, most (42) were from nurses, 5 were from medical assistants, 1 was from a clinical officer, and 4 were from other staff (clinical technician; clinical officer intern and nurse midwife technician), making

it difficult to determine differences by staff designation. The questionnaires reflect both BEmOC and CEmOC care: 37 were from BEmOC facilities, comprising 35 from health centres and 2 from rural hospitals; and 15 were from CEmOC facilities. In terms of district breakdown, 20 were from Kasungu district (7 of which were from health centres) and 20 were from Salima district (18 of which were from health centres); The 12 questionnaires from Lilongwe district all came from health centres. Table 2 presents a summary of all the results from the provider questionnaire.

Table 2. Summary of results of provider knowledge survey

Questions (no.)	BEmOC staff (n=37)	Average % correct CEmOC staff (n=15)	Total (n=52)
Management of routine Labour (11)	78%	84%	80%
Monitoring of routine Labour (5)	36%	33%	35%
Emergency Obstetric Care (13)	64%	86%	70%
Neonatal Care (5)	56%	64%	58%
Staff-Patient interactions (10)	48%	28%	42%
Confidence			
not at all confident	66%	61%	64%
not very confident	50%	75%	57%
average	39%	75%	49%
confident	62%	74%	65%
very confident	60%	70%	62%
Study			
never studied	47%	57%	50%
ever studied	50%	65%	54%
studied in the last 5 years	53%	81%	61%
studied in last year	54%	66%	57%

1. Management of routine labour

Knowledge of appropriate management of women in routine labour was acceptable at 78% for BEmOC staff and 84% for CEmOC staff (Table 2) and there were no significant differences by staff designation. This demonstrates that respondents in all categories were generally aware of internationally recognized good practice. One area of concern is the widespread assumption (amongst 58% of respondents) that women should labour on their backs, rather than in their position of choice (only 37% of respondents chose this response), which is thought to increase duration of labour and resultant risk of complications as well as potentially affecting women's satisfaction and desire for institutional delivery.

2. Monitoring in routine labour

Table 2 shows that knowledge of the correct frequency of

monitoring patients in routine labour is equally lacking in BEmOC and CEmOC facilities with an average of only 36% and 33% correct responses respectively; there were also no significant differences by clinicians' designation. Knowledge of foetal heart rate monitoring (at least every 30 minutes) was the best-answered question, with 79% answering correctly.

3. Emergency obstetric care

On average respondents got 70% of the questions correct, but there was significant variation between clinicians' designation and place of work. Overall, the clinical officer got 92% correct, Nurses 69%, and Medical assistants 70%. There was a significant difference between staff at CEmOC facilities, who answered 86% of questions correctly and staff at BEmOC facilities who got only 64% correct. The BEmOC results are particularly alarming, with 20% of respondents giving life threatening responses overall. There was however significant variation between scenarios. 100% of all respondents correctly identified the need for a blood transfusion for an anaemic patient and 88% answered the post-abortion care question correctly. In contrast, only 56% of respondents identified correct management of eclampsia and pre-eclampsia, with 10% giving the life-threatening response 'no action required' to the pre-eclampsia question.

4. Neonatal care

Knowledge of neonatal care was uniformly low with an average of only 58% correct answers overall. It is interesting to note that CEmOC staff were only slightly more knowledgeable (64% correct answers) than BEmOC staff (56% correct answers; Table 2). Differences between staff groups were also minimal in this area. The worst-answered questions were 'management of a baby who does not breathe spontaneously' (which only 35% answered correctly) and 'management of a baby with low Apgar scores at 1 minute', which 58% answered correctly, whilst 23% gave potentially life-threatening responses, including 4 respondents (8%) who said no action was required and 2 respondents (4%) who said they did not know what to do. Responses demonstrated a widespread lack of awareness of danger signs in a newborn infant and a limited understanding of simple lifesaving procedures, such as stimulation of the newborn, skin-to-skin contact and early initiation of breastfeeding as well as use of oxygen and cardio-pulmonary-resuscitation.

Staff-patient interactions

The questions relating to staff attitudes and perceptions of care indicate that staff have a generally negative perception of the care they provide. Only 42% felt that their care is ideal and only 50% of staff indicated that they would always recommend a friend/relative to deliver in their facility. Moreover, only 27% of respondents indicated that their facility was always clean enough and only 42% indicated that patients always get enough information at discharge (which is essential for the prevention of postpartum and neonatal deaths). In general, it is notable that staff perceptions seem to be more positive in BEmOC facilities (48% ideal on average) than in CEmOC facilities (only 28% ideal on average; Table 2).

Confidence

Confidence appeared to be unrelated to the number of questions the respondent got correct (Table 2). BEmOC staff respondents who said that they were not confident, got an average of 66% of questions correct, whereas respondents who said they were very confident got, on average, 60%

correct. CEmOC staff 'not at all confident' respondents got 61% of questions correct and 'very confident' respondents, 70%. Overall, those indicating they are very confident were, however, often less knowledgeable than others, indicating that in many cases such confidence is misplaced. For example: only 50% of the four health centre respondents who claimed to be 'very confident' in post-abortion care got both answers to the septic abortion management question correct; and 86% of the respondents who were 'very confident' in neonatal resuscitation got both neonatal questions wrong (on managing Asphyxia and low Apgar score). Similarly, only 1 out of the 6 respondents who were 'very confident' in care of the low birth weight infant got both questions on this correct. This evidence suggests that reported confidence may be a poor marker of clinical knowledge. However, in the area of emotional support of the woman in labour, in health centres at least, there was a slight trend towards more ideal staff-patient interactions occurring at facilities where respondents who are more confident in emotional support of the woman in labour work.

Previous study of subjects

Table 2 also summarises the association between knowledge of a specific subject and study of the same subject either never, ever, in the last 5 years or in the last year. Among BEmOC staff those who had studied a subject, or had studied it more recently, on average got slightly higher percentages of the questions correct (Table 2). Among CEmOC staff, a lack of correlation is apparent with lower rates of correct answers in respondents who had studied a subject more recently compared to those who report having studied the subject longer ago or even never (Table 2). For example, whilst only 40% of CEmOC respondents who had studied eclampsia and pre-eclampsia in the last year got both these questions correct, 50% who report never having studied these subjects got both answers correct. Overall, those who reported never having studied a specific subject got 50% of subject-specific questions correct whilst those who had studied the subject in the last year got 57% correct. In both BEmOC and CEmOC staff there was no positive correlation between the number of years of professional training received and the number of correct responses. There was also little correlation between clinical knowledge and year of graduation, although among CEmOC staff at least, those who trained longer ago and therefore had more experience, were more confident and also perceived more ideal staff-patient interactions in their facilities than younger staff.

Discussion

We found strengths in knowledge of management of routine labour, with good knowledge of internationally-recognised good practice across all groups and, for CEmOC staff, reasonable knowledge of how to manage obstetric emergencies. But there are concerns about BEmOC staff knowledge of emergency care, and for all staff about the correct frequency of monitoring in routine labour and newborn care, which was generally poor. These observations contribute to our understanding of the role of Malawian health professionals in preventing maternal and neonatal deaths. In Malawi, women are being encouraged to deliver in health facilities, in order to benefit from skilled attendance at birth, but these results must call in to question the skills of those attendants in Malawian facilities. In the context of limited health worker numbers and limited material

resources, the knowledge and skills of those providing care is of utmost importance. Highly skilled health workers might be able to overcome resource limitations by careful monitoring, identification of emergencies, correct use of available drugs and equipment and correct referral. However, this study suggests that in fact, staff might not recognize danger signs, might have limited knowledge of emergency procedures and might not know when to refer appropriately. In addition, recognizing that a questionnaire tends to produce idealized responses, it is possible that knowledge put in to practice is worse than these results indicate. Although being questionnaire-based means this study may be biased towards showing idealised behaviour, alternative measures of providers' knowledge, such case-notes review or direct observation of caregiving were not feasible in this context. Case notes in Malawi tend to lack detail¹⁶. Direct observation requires prolonged expert observation, which was not possible due to human resource constraints. Another limitation of this study is the small sample size, which limits our ability to make inferences about the total population of clinicians in Malawi and prompts the need for further studies to corroborate our findings. There was also a lack of clinical officer respondents, meaning we are unable to make adequate comparisons between different professional groups. With regard to monitoring during routine labour, staff typically responded that vital signs and vaginal examinations should be performed more frequently than recommended, whereas evidence reported elsewhere suggests a significant lack of monitoring in practice, even in emergency situations¹⁶.

The results of the neonatal care questions were alarming. Given that the questions described everyday scenarios, it was notable that few respondents were able to answer them correctly and many gave dangerous responses. Basic newborn resuscitation requires minimal equipment and has the potential to prevent 30% of intrapartum neonatal deaths¹⁷, however from the results of this study, it seems that health workers may be poorly equipped to achieve this target. The quality of care described by this questionnaire's respondents is also discouraging. In this questionnaire, staff reported generally low levels of satisfaction with the care provided in their facilities. It is difficult to know whether this poor perception of care is a cause or an effect of the low levels of staff motivation reported elsewhere¹⁵ pages 43-4, 178, 198-9, 284-8. Across Malawi, health workers tolerate insufficient staffing, poor working conditions, limited functioning equipment and frequent stock-outs of essential drugs⁸, and inconsistent training and supervision, so it is not surprising that morale and perceptions of care are low. But with health workers rating the care they give so poorly, women may feel discouraged to give birth at health facilities. It is interesting to compare these results with the perceptions of patients and guardians from the 'Women-Friendly Care survey' conducted by this research group, which indicate that patients and guardians also feel particularly dissatisfied about asking questions and getting answers from staff¹⁵ pages 180-1.

It might be expected that the limitations in knowledge and care-giving identified by this questionnaire might be resolved by further training of health workers. However, this is not necessarily supported by the data. In fact, responses to the 'confidence' questions call into question health workers ability to correctly identify their learning needs. In addition, recentness of study and duration of training did not correlate

well with respondents' levels of knowledge. Bearing in mind that spending time on training courses is the main reason for absences from clinical work, this evidence calls in to question the overall benefits for the health sector of training courses which take health workers away from their duty stations. Knowledge was better (for emergency Obstetric Care at least) amongst those working in a CEmOC facility, which suggests that working in a teaching institution may be more beneficial than classroom learning in improving knowledge and quality of patient/health worker interactions. This suggests that there may be room to disseminate knowledge of best practice within the health service by bringing elements of the CEmOC environment in to BEmOC centres. Exposure to more highly-trained clinicians, on-the-job training and supervision may prove to be the way forward for improving knowledge amongst Malawi's health-workers. Distance learning using practice-based scenarios and mobile phones might be another way to take improvements to scale.

References

1. Graham WJ, Bell J, Bullough CHW. Can skilled attendance at delivery reduce maternal mortality in developing countries. *Studies Health Serv Organ Policy* 2001; 17: 97-130.
2. Miller S, Cordero M, Coleman AL, et al. Quality of care in Institutionalised deliveries. The paradox of the Dominican Republic. *Int J Gynaecol Obstet* 2003; 82: 89-103
3. Institute of Medicine. Medicare: A Strategy for Quality Assurance, Vol.1. Series Editor: Lohr, K. The National Academies Press, Washington DC, USA; 1990.
4. Hulton L, Matthews Z, Stones R. A framework for the evaluation of quality of care in maternity services. University of Southampton, UK; 2000.
5. Nolan T, Angos P, Cunha AJ, et al. Quality of hospital care for seriously ill children in less-developed countries. *The Lancet* 2001; 357: 106-110
6. National Statistical Office (NSO) and ICF Macro. Malawi Demographic and Health Survey 2010. Zomba, Malawi and Calverton, Maryland, USA: NSO and ICF Macro; 2011.
7. Lungu D, Acharya A, Palmer N. Constraints to implementing the Essential Health Package in Malawi. *PLoS ONE* 6(6): e20741. doi:10.1371/journal.pone.0020741; 2011.
8. Leigh B, Mwale TG, Lazaro D, Lunguzi J. Emergency obstetric care: How do we stand in Malawi? *Int J Gynaecol Obstet* 2008; 101: 107-111
9. National Statistics Office (NSO) [Malawi], ORC Macro [USA]: Malawi Demographic and Health Survey 2004. Calverton, Maryland: NSO and ORC Macro; 2005.
10. UNICEF, WHO, UNFPA. Guidelines for Monitoring the Availability and Use of Obstetric Services. United Nations, New York, NY, USA; 1997.
11. WHO. Pregnancy, childbirth, postpartum and newborn care: a guide to essential practice. World Health Organisation, Geneva, Switzerland; 2006.
12. Republic of Malawi Ministry of Health. Participants Manual in Integrated Maternal and Neonatal Care. Republic of Malawi Ministry of Health, Lilongwe, Malawi; 2009.
13. WHO. Care in normal birth: a practical guide. World Health Organisation, Geneva, Switzerland; 1996.