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CLINICAL DECISION-MAKING AND REFERRAL OF OBSTETRIC EMERGENCIES: A CASE OF EmONC TRAINED AND UNTRAINED NURSES AND MIDWIVES IN MPIKA DISTRICT, ZAMBIA

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Abstract:
Background: Prompt decision-making in referring women with obstetric complications to the next level of care for further management by nurses and midwives is critical in reducing the maternal mortality rate. The study was conducted to determine whether there was a difference in clinical decision-making between nurses and midwives trained in Emergency Obstetric and Neonatal Care (EmONC) and the untrained in referral of obstetric emergencies. The total maternal mortality for Mpika District in 2014 was 12, and out of the twelve (12) recorded deaths, ten (10) were from the referred cases. There is still high maternal mortality in Zambia despite strategies like EmONC being implemented, whose goal is to provide knowledge and clinical and decision-making skills to nurses and other relevant staff to respond appropriately to obstetric emergencies. **Objective:** The main objective of the study was to determine the differentials in clinical decision-making and referral of obstetric emergencies between nurses and midwives who had undergone training in EmONC and those who had not. **Materials and Methods**: This was a cross-

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sectional survey conducted in Mpika District. A sample size of 18 nurses and midwives was selected using the census method, and 111 obstetric referral records were purposively sampled. A pre-tested self-administered questionnaire and checklists were used to collect and record the information. Data was analysed using SPSS for Windows statistical software version 22.0. The chi-square test was used to test associations between the dependent and independent variables. **Results:** The findings revealed that out of the 18 nurses and midwives who participated in the study, (44%) 8 were trained in EmONC while (56%) 10 were not. The findings showed no difference in timely referral of obstetric emergencies ($\chi 2 = .407$; $p>0.005$). The findings did not show a strong relationship between being trained in EmONC and the outcome of an obstetric emergency ($\chi 2 =0.644$ $p> 0.005$). However, Environmental and organizational contexts of decision-making, such as availability of transport by the referring unit (95% CI, P- Value 0.002), going to the hospital with a referral letter (95% CI, P-value = 0.016) and documentation of pre-referral treatment on the referral form (95% CI, P-value = 0.019) were significantly related to being referred by EmONC trained nurse or midwife. **Conclusion:** The results indicate that there was no difference in clinical decision-making between the EmONC-trained and the untrained nurses and midwives in relation to timely referral, foundational knowledge and outcome of referred obstetric emergencies. However, the availability of transport has been seen to have an influence on the number of cases referred. This study highlights the fact that given all the logistics, nurses and midwives can make timely decisions on the referral of obstetric emergencies. **Recommendations**: There is a need for MoH to consider making transport available at rural health facilities and possibly establish Zonal health facilities that can help in both referral and management of obstetric emergencies.

Keywords: clinical decision-making, EmONC-trained nurses and midwives, referral of obstetric emergencies, emergency obstetric and neonatal care

1. Introduction/ Background Information

Nurses and midwives face an endless variety of clinical situations. In every situation, they need to think critically and make accurate, timely and appropriate clinical decisions so that clients receive the best care (1). Nurses' and midwives' clinical decision-making on the referral of obstetric emergencies includes, among other things, deciding why the woman should be referred, when to refer and how to refer (2). The situated clinical decision-making framework provides a structured approach to analysing nurses' and midwives' decision-making in clinical nursing practice, assists educators in identifying specific issues within nurses' clinical decision-making, and guides the selection of relevant strategies to support the development of clinical decision-making (3).

The situated clinical decision-making framework incorporates context, foundational knowledge, decision-making processes and thinking processes. Cranley et al. (4) conducted a systematic review from 1990 to 2007 on nurse's clinical uncertainty and conceptualization. The findings revealed that little exploration has been done of

nurses' experience of uncertainty in practice. Many investigators have not theorized the uncertainty in their studies but have described nurses' uncertainty in the context of clinical decision-making.

Hagbaghery (5) identified five main themes from the data collected. From the participants' points of view, "feeling competent", "being self-confident", "organizational structure", "nursing education", and "being supported" were considered as important factors in effective clinical decision-making. However, the researcher did not find any similar study conducted in Zambia. Hence, little is known about nurses' and midwives' clinical decision-making, especially when referring to obstetric emergencies.

The leading direct causes of maternal deaths include haemorrhage, infection, eclampsia, obstructed labour and septic abortion. Prevention and management of these complications require care by a skilled-birth attendant such as nurses and midwives and timely access to Comprehensive Emergency Obstetric Care (CEmOC) (6).

Since the primary causes of maternal mortality are difficult to predict in advance, global health experts such as the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and UN Population Fund (UNFPA) advocate for improved access to Emergency Obstetric and New-born care (EmONC) as the best means for reducing maternal mortality in low and middle-income countries (7). Nurses and midwives trained in EmONC are expected to make accurate and timely clinical decisions regarding the referral of emergency obstetric cases for further management. Most obstetric complications occur suddenly, without warning, and can neither be predicted nor prevented. However, if women receive treatment in time, almost all complications can be prevented. If women do not receive medical treatment on time, they will probably suffer disability or die.

Therefore, in order for nurses and midwives to provide quality emergency obstetric care, they need to have good clinical decisions and judgement abilities, which are mostly covered in EmONC training (2).

However, according to the available data at Mpika District Medical Office (DMO), only 13 nurses and midwives were trained in EmONC and of the 13, only three (3) nurses and five (5) midwives were from the rural health centres. In addition, there were 114 referred cases of obstetric emergencies from rural health centres, and of the 12 recorded maternal deaths in the district, 10 were from the referred cases (8). A review of the maternal mortality by the Maternal Mortality Review Committee for Mpika District Hospital and Chilonga suggested poor decision-making by nurses and midwives as a contributing factor to the said maternal deaths and identified that there were more maternal deaths among the referred cases compared to those whom the two hospitals directly admitted. Hence, this study has helped in identifying the major contributing factors to the high maternal deaths among the referred cases and has also identified gaps as far as nurses' and midwives' clinical decision-making is concerned.

2. Materials and Methods

2.1 Research design

A cross-sectional survey was used to determine whether there was a difference in clinical decision-making between the EmONC-trained and untrained nurses and midwives in Mpika District. The study employed the quantitative approach, and the data collection tools used were a pre-tested self-administered questionnaire and checklists.

2.2 Research setting

The research was conducted in 16 rural health centers within Mpika District, Chilonga General Hospital, and Mpika District Hospital, which are situated in Muchinga Province of Zambia.

There are currently twenty (20) health centers in Mpika district with one district hospital and one general hospital (Chilonga Mission). Of the 20 health centres in Mpika District, 16 of them are being run by nurses and midwives. Other centres are manned by either Clinical officers or Environmental Health Technicians. The research setting comprised of 16 health centers. The centers were conveniently selected as they are managed by nurses and midwives, and all of them offer maternal and child health services. A review of referral letters and relevant records was also conducted at Chilonga General Hospital and Mpika District Hospital, respectively, using a checklist to clarify some information on decision-making that was collected using a questionnaire.

2.3 Study/target population

The study population was comprised of nurses and midwives in active employment between 18 and 55 years, working in the 16 selected health centres of the Mpika district. They met the criteria and were willing to participate in the research study.

2.4 Sample selection

The census method was used as a sampling technique to select nurses and midwives because they were limited in number. Hence, all nurses found working in the 16 selected rural health centers were included in the study after consenting. A review of the referral forms and records for the obstetric emergency cases referred by nurses and midwives from the 16 selected health centres for 2014 was conducted using checklists at Mpika District Hospital and Chilonga General Hospital, respectively. The rural health centers (RHCs) were selected using the purposive sampling method because they were being manned by nurses and midwives and offered maternal and child health services. As such centers which were being managed by other health personnel such as clinical officers and environmental health technicians, were not included in the study. This was done with the assistance of the human resource officer who availed the list of centers and health personnel manning them.

2.5 Sample size

18 Nurses and midwives were purposively selected (8 trained in EmONC and 10 not trained in EmONC). Hundred and eleven (111 referral) forms and records were reviewed by use of a checklist.

2.6 Data collection tools

A pretested self-administered questionnaire and checklists were used to collect and record information. The questionnaire consisted of questions whose wordings were predetermined for both the questions and response alternatives. The questionnaire comprised four sections. Section A consisted of questions on the respondents' demographic data. Section B was comprised of questions on timely referral. Section C comprised questions on environmental and organizational context for clinical decision-making, and section D elicited information on the foundational knowledge of nurses and midwives on EmONC. Section E had questions on the decision-making process.

On the other hand, the hospital checklist had a specific outline of predetermined questions based on the referral forms and other relevant records. It gave an insight into some of the decisions made by nurses and midwives based on the theoretical framework. The RHC checklist had predetermined questions on timely referral, environmental context and foundation knowledge.

2.7 Ethical consideration

Before conducting the study, ethical approval and permission were sought from the Excellence in Research Ethics and Science Coverage Committee (ERES). After permission was granted, permission from the provincial medical officer for Muchinga Province, the medical superintendent for Chilonga and the district medical officer for Mpika was also obtained.

Permission was also sought from the charge of the 16 centres which were included in the study and the one centre for a pilot study. In addition, the study's purpose was explained, and written consent was obtained from each respondent before the study. Those who did not consent to participate in the study were reassured that they would suffer no consequences due to not participating. The respondents were not remunerated in any way. Study participants were told they were free to withdraw from the study at any time without suffering consequences. The complete self-administered questionnaires and checklists were kept secure to avoid unauthorized access to the information gathered. Anonymity and confidentiality were ensured during the data collection by using codes instead of names on the questionnaires and checklists.

3. Results

The study revealed that most (39%) of the respondents were aged between 41 and 50 years, and about (39%) of the respondents were enrolled nurses. Most respondents (33%)

had worked for more than 8 years, and less than (23%) had worked for less than 2 years in the labour ward. The mean age was 40 (Table 1).

The study also revealed that all (100%) respondents had been referred to a patient with an obstetric emergency at one time or another. Obstructed labour (22%) and haemorrhage (22%) were the commonest cases referred, and the least referred were eclampsia and septic abortion, with a percentage of 5% each.

The study further revealed that more than half (56%) of respondents' decisions to refer were made after identifying the danger signs. The study also revealed that more than three-quarters (89%) of respondents reported that it took them 30 minutes to 1 hour to decide to refer a patient with an obstetric emergency (Figure 1). The study also revealed that a large percentage (89%) of the respondents stated that they referred patients for further management, such as surgery and only 5.6% referred patients for lack of knowledge of the condition and its management or for diagnosis.

Regarding foundation knowledge of EmONC, less than half (44%) of respondents were trained in EmONC, while 56% were not. On obstetric emergencies confidently handled, half (50%) of the 8 EmONC trained respondents were able to handle all obstetric emergencies, while 37% could only handle haemorrhage and obstructed labour confidently.

On whether the referred case was accompanied, the results revealed that more than three-quarters (88%) of the referred cases were not accompanied by a skilled attendant. The study also revealed that most (66%) of the referred cases' pre-referral treatments were not documented, and only 34% had pre-referral treatments well documented. The study further revealed that (72%) of the referred cases were coming from facilities where there was no available transportation, while 28% of the referred cases were referred by one facility with an ambulance. The reviewed records also showed no feedback on 95% of the referred cases. It was further revealed that diagnoses made on 87% of referred cases by the referring facilities corresponded with those made at the hospital and differed on only 13% of the cases referred. Concerning the outcome of referred obstetric cases, 49% of obstetric emergencies referred ended up in surgery, 40% ended up in normal delivery, and 7% ended up in maternal death.

Concerning the relationship between being trained in EmONC and the time taken to decide to refer a patient to the next level of treatment, the study revealed that of the 8 respondents who were trained in EmONC, all (100%) were able to decide to refer patients within 30minutes to 1 hour. On the other hand, the majority (80%) of those not trained were also able to refer within 30 to 1 hour. The Fisher's Exact Test analysis showed no significant relationship between the two variables (P-value 1.000). When it came to the reason for referring patients, the study showed that the majority (88%) of the respondents who were trained in EmONC referred patients for further management, such as surgery, and so were the 90% untrained. This study has shown no statistical significance (P-value=0.706) between being trained in EmONC and the reason for referring patients, as shown by the P-value.

The findings did not also show a strong relationship between being trained in EmONC and the outcome of an obstetric emergency ($\chi 2 = 0.644$ $p>0.005$). However, Environmental and organizational contexts of decision-making, such as availability of transport by the referring unit (95% CI, P-value 0.002), going to the hospital with a referral letter (95% CI, P-value = 0.016) and documentation of pre-referral treatment on the referral form (95% CI, P-value = 0.019) were significantly related to being referred by EmONC trained nurse or midwife (Table 2).

3. Discussion

The demographic characteristics of the respondents, which were relevant to the study and essential for interpretation, included age, professional qualification, work experience, and duration of work in the labour ward. The respondents were nurses and midwives between 18 years and 55 years and 39% were aged between 41 and 50 years. Thirty-nine percent (39%) of respondents were enrolled midwives. This is because enrolled nurses and midwives are frontline health workers at the grassroots level. About 33% of the nurses and midwives had worked for more than eight (8) years**.** According to Omo-Aghoja (9), the best care comes from the combination of theoretical, tacit and experiential knowledge. Nurses and midwives who have faced different critical conditions and have worked for many years may gain the competence to handle any situation. In addition, it can be said that having more trained midwives with specific skills and competencies and working for more years may have a positive impact on decision-making.

3.1 Timely referral of obstetric emergencies

Section B of the questionnaire had closed-ended questions that aided in determining whether nurses and midwives made timely referrals for the obstetric emergencies referred. The results showed that more than three-quarters (88%) of the respondents were able to decide to refer within 30 minutes to 1 hour. However, 39% of the respondents reported that it took about two (2) to three (3) hours before the referred case was taken to the hospital. The findings of this study are similar to those of Maine (10), who stated that 20% of the delays in the management of pregnancy complications result from type II delay, which is transportation difficulties.

The study results have shown that nurses and midwives were generally able to make timely decisions and even those who made decisions later than one hour related it to lack of available transport. Hence, the findings of this study contradict with Etuk (11), who stated that in Africa, maternal deaths are associated with delayed referrals for women from lower-level facility, where referral systems are not well equipped to handle emergency obstetric care.

The findings further showed that slightly above half (56%) of the respondents' decision to refer were made after identifying the danger signs. This could be due to the fact that the nurses and midwives were trained to identify danger signs during general

nursing training and others during EmONC training. The other findings were that of the 111 referred cases, there was no feedback on the outcome of the 95% referred cases. This could be attributed to staff shortage or lack of training in EmONC among nurses and midwives and the fact that the receiving facilities could not have attached any importance to the need to provide feedback. The other reason could be that most referring facilities do not make follow-ups on the referred cases. The findings of this study are similar to Kongnyuy et al., (12), whose findings showed a lack of feedback on 98% of cases referred in his pre-audit findings.

Besides, documentation of pre-referral treatment was done on only 66% of the referred cases, which could be either a result of staff shortage or lack of training in EmONC. The other findings were that only (12%) of the referred cases were accompanied by a skilled attendant. As earlier alluded to, this could be attributed to a shortage of staff at the health facilities and the fact that the ambulance was, in most cases, accompanied by a staff from the referral hospital. This finding agrees with that of Kongnyuy et al. (12), where only 13.4% of referrals were accompanied by health personnel, although the current study findings are less than 1.4%. On transportation, only 28 % of the referred cases came from facilities with ambulances. These findings support earlier findings by WHO (13) conducted a study in rural Ghana to identify gaps in the referral process of obstetric emergencies and transportation was identified as a major problem among other gaps. What can also be appreciated is the fact that the only facility with an ambulance was able to refer 31 out of 111 cases (28%). It can be postulated that if all sixteen (16) health facilities had available transport, they were going to make more prompt referrals of obstetric emergencies, which is key in serving lives.

3.2 Environmental and organizational context of decision making

Section C of the questionnaire had both closed and open-ended questions that aided in determining the environmental and organizational contexts of decision-making. The findings showed that most (61%) of the respondents' facilities operated 24 hours**.** The above findings agree with the Ministry of Health's categorisation of health facilities, which is in line with the WHO (13) explanation, which states that 'if a facility cannot provide 24-hour medical care in addition to amenities such as toilets, clean water, and obstetric beds, women could less likely to seek out that facility when they are in labour. Nonetheless, even if such facilities operated 24 hours, they were met to operate up to 16 hours, but the workload and demand by the community made them operate 24 hours.

The findings also showed that 89% of the respondents referred patients for further management, such as surgery, compared to 5% who referred patients due to a lack of knowledge of the condition and its management. This finding could be attributed to the EmONC training the respondents received. However, the findings differ from those of Tshimanga (14), where 37% of referrals were made for surgery. There is a need, therefore, to train the respondents who do not know how to manage emergency cases.

These findings support WHO (13), which stated that improvements in the facility infrastructure could encourage women to deliver at the facility; provision of a high

standard of care at those facilities could improve outcomes, leading to further increases in their use. This means that if these facilities could provide advanced services like surgery, nurses and midwives would not refer patients.

The current study showed that 66% of the referred cases' pre-referral treatments were not documented. There is a standard pre-referral treatment that should be administered before each patient is referred to the next level of treatment. Perhaps these nurses and midwives did not give the pre-referral treatment due to ignorance, hence the need to train them in EmONC.

3.3 Foundational knowledge on EmONC

Section D of the questionnaire had both closed and open-ended questions that aided in determining the foundational knowledge of nurses and midwives on EmONC. The results showed that less than half (44%) of respondents were trained in EmONC, while 56% were not. This could be attributed to the fact that some nurses and midwives who were trained in EmONC were based at the hospital, and others have retired. The WHO (15) states that training deficits exist in the medical workforce and recommends that health centre workers need training in all basic EmONC functions. This is because, without trained workers, none of the signal functions of routine or emergency care can be performed.

The study revealed that only half (50%) of the EmONC-trained respondents were able to handle all obstetric emergencies confidently. In comparison, 37% of the respondents could only handle haemorrhage and obstructed labour confidently. This could be a result of a lack of refresher courses, and supervision could also play a role in this situation. When trained nurses and midwives are not supervised, they are likely to forget the learned skill. The study also revealed that about half (50%) of the respondents were able to confidently perform two Basic EmONC functions, 33 % were able to perform three basic EmONC functions administer and only (6%) of the respondents were able to confidently perform all the basic EmONC functions. This could also be attributed to a lack of EmONC training or inadequate training. The findings of this study support earlier findings by Crofts (16), who revealed that only 6% of their respondents were able to perform all EmONC functions. This, therefore, shows that even after undergoing the EmONC training, some nurses and midwives were not able to perform all the basic EmONC functions.

The results also showed that 76% of the patients referred had either prolonged labour or obstructed labour followed by (14%) of Antepartum Haemorrhage /Postpartum Haemorrhage (APH/ PPH) cases. Only 2% of cases of puerperal sepsis were referred. This shows that the most common obstetric complications in Mpika are prolonged and obstructed labour. This could be attributed to either the use of African syntocinon to speed up labour and delivery or early marriages. Most young girls are married off early and get pregnant before their bodies are mature, thereby ending up with obstructed labour. These findings agree with the WHO (17) findings, which ranked obstructed

labour and Haemorrhage as the leading direct causes of maternal deaths especially in the developing world.

Encouraging enough, the study further revealed that 87% of the diagnosis made on the referred cases by the nurses and midwives corresponded with those made at the hospital**.** This could be attributed to EmONC training that the nurses and midwives received and their basic foundation nursing and midwifery knowledge. The findings of this study differ from Tshimanga. (14) study where only 49% of the cases were for doctors to establish the diagnosis and out the total referrals by the nurses only 16% were admitted. Therefore, it can be concluded that there is need for reducing the number of referrals made if a secondary or tertiary level of care institution is availed and /or if clinic operations are reorganized to make medical officers more accessible to registered nurses during working hours which is not always a case especially in rural areas like Mpika District where in most cases, the only available health worker at the clinic is a nurse, midwife, Environmental Health Technician (EHT) or none at all.

With regards to the outcomes of referred obstetric cases, 49% of obstetric emergencies referred ended up in surgery, 40% ended up in normal delivery and 7% ended up in maternal death**.**

These findings highlight the important fact that nurses and midwives were able to make correct diagnoses on majority of the referred cases and that if those referrals were not made, worse outcomes were expected since their facilities had no infrastructure and manpower to conduct operations.

3.4 Clinical decision-making process

Section E of the questionnaire had both closed and open-ended questions that aided in determining the clinical decision-making process of nurses and midwives. The study revealed that slightly above half (56%) of the respondents reported that they based their decision on the severity of symptoms, while 33% based their judgements on physical assessment of the patients**.** According to Higuchi (18), nurses and midwives must act in a particular situation and time with the best clinical and scientific knowledge available. Hence, the severity of the patient's condition based on the signs and symptoms can be the best clinical and scientific knowledge available to the nurse or midwife.

The study further revealed that 39% of the respondents' collected cues by looking at the signs and symptoms, 28% collected cues by conducting physical assessment, while 22% collected cues by observation and the other 11% said they collected cues through conversation with the patient**.** These findings relate well to Purkis (19), who reported that the best clinical judgement, that is, reasoning across time about the particular patient through changes in the patient's concerns and conditions and/or the clinician's understanding is also required and that the meanings of signs and symptoms are changed by sequencing and history and that the patient's mental status, colour, or pain level may continue to deteriorate or get better. As such, it can be seen from these findings that the respondents used different means of cue collection.

The study results showed that 44% of respondents indicated that resources such as transport, logistics and others were considered before referral, and about 39% considered the severity of the condition before referral. The findings of this study could mean that if resources such as transport and other logistics are not available, nurses and midwives may be hesitant to refer. Worse still, if the severity of the patient's condition is not adequately ascertained, wrong decisions can be made.

4. Conclusion

The study results have indicated that there was no difference in clinical decision-making between the EmONC-trained and the untrained nurses and midwives concerning timely referral, foundational knowledge and outcome of referred obstetric emergencies. However, the availability of transport has been seen to influence the number of cases referred. This study highlights that given all the logistics, nurses and midwives can make timely decisions on the referral of obstetric emergencies and that nurses and midwives in Mpika District could provide the best of care despite the limited resources.

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Author's Contribution
PB conceptualized the study, collected and analyzed data and drafted the manuscript. CMN supervised proposal development and the research process, participated in drafting and proofreading the manuscript. EM supervised proposal development and the research process. All authors read and approved the final manuscript.

Declaration of Interest
The authors declare that they have no competing financial or personal interests that influenced the study.

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References

1. Hazel, M. (ed) *Potter and Perry's Foundations in theory and practice*. 4th ed. Mosby, St Louis; 2005. Retrieved from https://books.google.ro/books/about/Potter_and_Perry_s_Foundations_in_Nursin.html?id=Cw8izgEACAAJ&redir_esc=y
2. Clack, F. *Decision making in nursing practice: a case review.* Available from https://doi.org/10.7748/paed2009.06.21.5.24.c7078 [Accessed on 3rd February,15].
3. Gillespie M. and Paterson D. *Helping nurses make effective Clinical decisions: the situated clinical decision-making framework; Nursing Education Perspective*, 30 (3) (2009), pp.164-170. Available from http://www.science/direct.com/science/article/pill/s147195310000357 [Accessed on 12th March, 2015].
4. Cranley, L, Doran DM, Salsali M, Almadi F, (2009). *Nurses' uncertainty & decision making: a literature review*. Available from: https://doi.org/10.1111/j.1741-6787.2008.00138. [Accessed on 20th September, 2015].
5. Hagbaghery, M.A, The *factors facilitating and inhibiting effective clinical decision making in nursing.* Available from: http://www.ncbi.nih.gov/pubmed/2004/1653093020 [Accessed on 20/09/15].
6. Al Hajeri, A. (2010). *Referrals from Primary care-ways of optimization*, Bahrain Medical Bulletin, vol.32, No.2; 2010. Retrieved from https://www.researchgate.net/publication/242019201_Referrals_from_Primary_Care_-_Ways_of_Optimization
7. WHO, UNICEF, UNFPA, estimates TWB: *Trends in Maternal Mortality: 1990 To 2010*. Geneva: WHO; 2010. Retrieved from https://iris.who.int/bitstream/handle/10665/44874/9789241503631_eng.pdf?sequence=1
8. MoH, *Mpika District HIMS*, MoH, Zambia; 2014.
9. Omo-Aghoja LO, Aisien OA, Akuse JT, Bergstrom S, Okonofua FE. Maternal mortality and emergency obstetric care in Benin City, South-South Nigeria. Clin Med Res. 2010 2:55–60. Available from: http://www.academicjournals.org/JCMR/PDF/PDF2010/Apr/Omo-Aghoja%20et%20al.pdf [Accessed on 15th February, 2015].
10. Maine, D and Rosenfield, A. *The AMDD Program: History, focus and structure*, int., Gynecol-obstet, 70 (2), (2001), PP. 99-104. https://doi.org/10.1016/S0020-7292(01)00428-3 [Accessed on 11th March, 2015]
11. Etuk M. *Role of spiritual churches in antenatal clinic defaulters in Calaba*r, Nigeria. East Afr Med J. 1999; 76:639–643. Available from http://www.ncbi.nih.gov/pubmed/10734525 [Accessed on 20th July, 2015].
12. Kongnyuy, E.J, Mlava G, Van de Broek N (2008). *Criteria–based audit to improve a district referral system in Malawi - a pilot study.* BMC Health services Res: 2008 Sept

22; 8:190. Retrieved from https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-8-190

13. WHO. *United Nations Children's Fund; Trends in maternal mortality*: 1990-2010. Available from: http://whglibdoc.who.int/publication/2012/9789241503631 [Accessed on 15th March, 2015].
14. Tshimanga, M. *Consultations at Central hospitals: reasons and outcome of referrals from Urban clinics in Bulawayo, Zimbabwe;* 1995. Available from: http://www.ncbi.nih.gov/pubmed [Accessed on 2nd February, 2015].
15. WHO. *Monitoring emergency obstetric care: a handbook*. Available from: http://www.unfpa.org/webdev/global/shared/documents/publications/2009/obstetric-monitor.ing [Accessed on March 15, 2015].
16. Crofts JF. *EmONC: change in knowledge of midwives and obstetricians following obstetric emergency training; a randomized controlled trial of local hospital simulation and teamwork training;* 2012. Accessed on 15/03/15.
17. WHO: *Pregnancy, Childbirth, Postpartum and New-born Care: A Guide for Essential Practice*. Geneva: WHO; 2006. Retrieved from https://www.who.int/publications/i/item/9789241549356
18. Higuchi KA, Donald JG. *Thinking processes used by nurses in clinical decision making*. J Nurse Educ. 2002; 41:145–53. https://doi.org/10.1111/j.1466-769x.2006.00283.x [Accessed on 20th July, 15].
19. Purkis ME, Bjornsdottir K. *Intelligent nursing: accounting for knowledge as action in practice.* Nurs Philos. 2006; 7:247–56. https://doi.org/10.1111/j.1466-769x.2006.00283.x [Accessed on 20th July,15].

Appendix

Table 1: Respondents' Demographic Data (N=18)

		Frequency	Percent
Age	20-30	5	28
	31-40	5	27
	41-50	7	39
	50 and above	1	6
	Total	**18**	**100**
Professional Qualification	Enrolled Nurse	5	28
	Enrolled Midwife	7	39
	Registered Nurse	4	22
	Registered Midwife	2	11
	Total	**18**	**100**
Work Experience as a Nurse or Midwife	Less than 2 years	4	22
	2- 4 years	5	28
	5-7 years	3	17
	More than 8 years	6	33
	Total	**18**	**100**
Duration Working in Labour ward	Less than 2years	4	22
	2-4 years	6	33
	5-7 years	3	17
	more than 8 years	5	28
	Total	**18**	**100**

Table 2: Factors Influencing Clinical Decision Making and Referral of Obstetric Emergencies

Variable	**Outcome**		**p=0.05 (95% CI)**
	Trained in EmONC	**Not Trained in EmONC**	
Reason for referral			
For further management such as operation	88% (n=7)	90% (n=9)	*P*=0.706 (p>0.05)
Feeling confident to refer	88% (n=7)	50% (n=5)	*P*=0.069 (i.e., p>0.05)
Foundation knowledge			
Diagnosis from facility corresponds with hospital diagnosis	88% (n=46)	88% (n=51)	*P*=0.857 (i.e., p>0.05)
Outcome of referred cases			
Surgery	51% (n=27)	47% (n=27)	*P*=0.644 (i.e., *P*>0.05)
Deaths	6% (n=3)	9% (n=5)	*P*=0.719 (i.e., *P*>0.05)
Environmental and organisational context			
Patient referred went to hospital with referral letter	100% (n=53)	90% (n=52)	*P*=0.016 (i.e., p<0.05)
Documentation of pre referral treatment	45% (n=24)	24% (n=14)	*P*=0.019 (i.e., p<0.05)
Availability of ambulance at referring facility	42% (n=22)	16% (n=9)	*P*=0.002 (i.e., p<0.05)

Figure 1: Time Taken for Respondents to Decide to Refer a Patient with An Obstetric Emergency (N=18)