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Managing hypertensive disorders during pregnancy in low resource settings

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ABSTRACT

Background: Maternal deaths caused by hypertensive disorders are preventable. The purpose was to assess midwives' perceived knowledge and skills on the implementation of maternal health guidelines when managing hypertensive disorders during pregnancy.

Methods: Quantitative, cross-sectional method was used. Population comprised of 200 midwives. Data was collected through self-report questionnaires and analysed through Statistical Package for Social Sciences 24.

Results: Midwives (63.5%) possessed knowledge and skills of implementing maternal guidelines. While 77.5% experienced shortage of human and material resources. Non-compliance to ambulance services led to delayed initiation of treatment.

Recommendations: Continuous in-service training and education must be conducted. More resources to be provided to implement guidelines accurately.

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Hypertensive disorders in pregnancy; implementation of guidelines; midwives; perceived knowledge and skills

Introduction

The Department of Health (1), in the Saving Mothers Report of 2008–2010 reported deaths from hypertensive disorders of 24.58% and a slow decrease of 22.75% in 2011–2013 in South Africa. There is a significant connection between hypertensive disorders in pregnancy and the significance rate of maternal death and preterm deliveries (2). The maternal mortality rate (MMR) due to hypertensive disorders in Limpopo Province was 22, 91% in 2008–2010, and increased by 8% to 31.23% in 2011–2013 (3). Two districts in Limpopo Province; namely, Mopani and Vhembe Districts had a decline in MMR in 2011–2013 of 288.07 in three years, although in 2014, the districts experience an increase in the MMR of 234.75 in one year (3). Predictions were made that between 20% and 66% of maternal deaths occur in rural health institutions. However, deaths outside the institutions are not reported and the District Health Management Information System (DHMIS) does not have such data (1). Despite the training which is conducted on maternal health guidelines at PHC facilities, the implementation of these guidelines is not satisfactorily documented. This is despite the fact that a pregnant woman who is suffering from chronic hypertension is also at risk of developing eclampsia. Experienced skilled midwives or doctors must conduct ante-natal care (ANC) and assist with delivery at the hospital level (4). Despite these efforts pregnant women are still dying from eclampsia and pre-eclampsia. It is believed that this is because of non-implementation of the guidelines by midwives. The results of poor adherence and substandard implementation of guidelines is believed to result in high morbidity and mortality rate of mothers (5).

The Maternity Care Guidelines in South Africa indicate that when midwives diagnose women with gestational hypertension, they must contact and be referred to an experienced doctor for advice, and treatment must be started immediately or the women must be referred to the next level (6). Proteinuria, oedema and increased weight must be excluded every time a hypertensive pregnant women visits the PHC facility. This is done in order to exclude pre-eclampsia and eclampsia. Furthermore, pregnant women with mild to moderate pre-eclampsia must be given anti-hypertensive drugs and referred to the hospital the same day. If pre-eclampsia is severe, anti-eclamptic drugs must be given, in addition to hypertensive drugs, before referring the women to the hospital. The signs and symptoms of severe eclampsia were indicated as a Blood Pressure of 160/110mmHg, headaches, visual disturbances and dizziness. When the women experience signs of eclampsia, they should be given anti-eclamptic drugs, to prevent repeated episodes of eclampsia and anti-hypertensive drugs, and be turned

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on the side and transferred to the hospital (7). However, midwives are faced with challenges such as shortage of resources (both human and material) such as equipment and hypertensive drugs and lack of transport, when in need of transferring the women to the next level (8). Other researchers have found that ambulances were not utilized appropriately when there was a need to transfer a pregnant women; the ambulances were not available (9).

Midwives receive training on how to prepare an eclamptic box. Although the boxes are available at each facility, some midwives were found to lack confidence and competence in managing pregnant women with pre-eclampsia (7). Hence, the current study, to assess the perceived knowledge and skills of midwives regarding available maternal health care guidelines and their implementation when managing pregnant women with hypertensive disorders, was conducted. The study further identified the challenges faced by midwives in implementing maternal guidelines when managing women with hypertension during pregnancy.

Methods and design

The quantitative research approach was adopted, wherein a cross-sectional survey was used. The Population comprised of midwives who were working at the PHC facilities of Mopani and Vhembe Districts. The Slovan formula was used to determine the number of respondents required in the current study. Probability systematic sampling method was used to sample 200 respondents. Data was collected through self-administered closed-ended questions, which were completed by respondents at their work- place. The questionnaire included the following: demographic data, knowledge of available guidelines, implementation of guidelines, perceived competencies, training received and challenges faced when implementing the guidelines. Data was analysed using the Statistical Package for Social Sciences, version 24. Tables were used to present the data. Validity was ensured by presenting the research instruments to experts in the field of maternal health care services, who evaluated the content of the instruments. Reliability was ensured by conducting a pilot study, wherein ambiguous questions were identified and corrected before the main study was conducted.

Ethical considerations

The University of Venda Ethics Committee granted the ethical approval for the study (Ref: (SHS/16/PBC/34/1910). Permission to conduct the study was obtained from the Limpopo Provincial Health Department (Ref:4/2/2) and Mopani and Vhembe Districts Department of Health. Permission was granted to access the facilities for utilization of the selected facilities and the midwives. Informed consent was obtained from the respondents prior to data collection. Anonymity and privacy were maintained throughout the study. Furthermore, respondents were allowed to withdraw from the study at any point of the research process without prejudice or penalty. The consent form and the questionnaire were prepared in English.

Presentation of results

The majority of the respondents (41.7%) were aged 40–49 years, as the mean age of respondents. This meant that they had vast information on the management of most maternal health conditions. Almost all respondents, (91.5%) were females and few (8.5%) were males. This might have been influenced by the nature of work, which attracts more females than males. In addition, the majority of the respondents (81.5%) had work experience of more than five years in maternal health care services. This means that maternal health care services were provided by competent staff. However, some midwives lacked skills in the management of pregnant women with hypertension. More than half of the respondents (56.5%) were holders of a diploma qualification in basic midwifery, while few (4.5%) were holders of advanced midwifery. These midwives therefore had the required expertise in the management of maternal health issues. However, the limited number of advanced midwives could compromised the provision of maternal health care services to pregnant women (Table 1).

Table 2 shows that 71% of the respondents knew the categories of pregnant women who were at risk of developing pre-eclampsia, while 29% were unable to identify such women. Only 54.5% of the respondents knew midwives could continue to give magnesium sulphate to women with pre-eclampsia if patellar reflex was present, while 45, 5% did not know. Most respondents, (86%) knew the guidelines to be implemented when diastolic blood pressure was 110 or more, as indicated in Table 3.

From the results (Table 4), respondents were not sure of the type of hypertension in pregnancy and when it occurs. This was because 56% of the respondents agreed that gestational hypertension occurs before the pregnancy is 20 weeks old and 58, 5% agreed that essential hypertension occurs after 20 weeks of gestation in pregnancy. Both statement are incorrect. However, all midwives showed their competency when they indicated the importance of monitoring blood pressure on all

Table 1. Demographic profiles of respondents (N = 200).

Variables	No. (%)
Age	
20–29	22 (7.9)
30–39	65 (23.3)
40–49	116 (41.7)
50–59	65 (23.3)
>60	10 (3.5)
Gender	
Male	17 (8.5)
Female	183 (91.5)
Position	
Professional midwives	200 (100%)
Years in current position	
1–3	19 (9.5)
4–5	18 (9.0)
>5	163 (81.5)
Total	200 (100)
Qualifications	
Basic Diploma in Midwifery	113 (56.5)
Degree	78 (39.0)
Advance Midwifery	9 (4.5)
Total	200 (100)

Table 2. Midwives' knowledge related to available guidelines (n = 200).

Knowledge of guidelines	Correct response	Frequency (%)
Women are at risk of developing pre-eclampsia	Primigravida, women with chronic hypertension	142 (71.0)
Magnesium Sulphate given in pre-eclamptic	Check presence of patellar reflexes	109 (54.5)
The importance of blood pressure checking	Maternity care guideline in South Africa	184 (92.0)
Induced hypertension in pregnancy	Maternity care guideline in South Africa	144 (72.0)

Table 3. Guidelines to apply to pregnant women with a diastolic blood pressure of 110 or more, measured on 2 occasions four hours apart.

Which Guideline used?	Response	Frequency (%)
	Primary care 101	18 (9)
	Reproductive Health Guideline	8 (4)
	Maternity Guidelines of SA	174 (87)

pregnant women during each visit. Though 17, 5% indicated that primigravida were not at risk of developing pre-eclampsia, 82, 5% were competent about the phenomenon under study. More than half of the respondents, (65, 5%) indicated that they would not leave women with pre-eclampsia alone, while 28% would, and 6, 5% did not know what to do. Respondents who indicated that they would leave a pre-eclamptic woman to call for an ambulance, lacked knowledge and skills of what the maternity guidelines says.

Provision of knowledge enabled midwives to carry out the different functions in their working environment thus, implementing maternal health care guidelines competently. More than half, (64, 5%) of the respondents were trained on Essential Management of Obstetric Emergencies (ESMOE), while 34, 5% were not. For professional nurses who were exposed to the training of management of hypertension in pregnancy, 71, 5% indicated exposure to such trainings, while 28, 5% were not exposed to it (Table 5).

Table 4. Perceived competencies on the implementation of maternal guidelines (n = 200).

Question	Agree		Disagree		Don't know	
Implementation of maternity health care guidelines for hypertensive disorders in pregnancy	F	%	F	%	F	%
Is it important to monitor the blood pressure of each pregnant women during each visit, to prevent pre-eclampsia?	188	94	11	5.5	1	0.5
Gestational hypertension occurs before 20 weeks of pregnancy.	112	56	85	42.5	3	1.5
Essential hypertension occurs after 20 weeks of gestation in pregnancy.	117	58.5	70	35	13	6.5
A primigravida is not at risk of pre-eclampsia because of her first pregnancy.	34	17.0	165	82.5	1	0.5
You must call an ambulance, to avoid noise in the labour room of women with eclampsia.	56	28	131	65.5	13	6.5
You must continue with Magnesium Sulphate even when the respiratory rate is less than 16 b/minutes.	55	27.5	127	63.5	18	9.0
A primigravida with elevated blood pressure, and protein in urine will need to be transferred to the hospital without initiation of treatment.	35	17.5	160	80	5	2.5

The results (Table 6) show that midwives are faced with some challenges: Almost three quarters (77, 5%) indicated that the number of midwives did not correlate with the number of pregnant women on a daily basis. The information was supported by 75% of the respondents who indicated that two midwives were not allocated to render maternal health care services during the night. The shortage of midwives might have been influenced by inequality in the distribution of health care personnel and failure to hire more staff to replace those who had left the services. More than half, (63, 5%) of the respondents indicated the shortage of basic essential equipment and 80.4% indicated non-compliance of ambulance turnaround times.

Discussions of results

Two hundred (200) professional midwives were sampled from Mopani and Vhembe District. The

Table 5. Training received by midwives as part of support by managers (n = 200).

	Yes		No	
Questions	F	%	F	%
Did you receive training on the essential management of obstetric emergency (ESMOE)?	129	64.5	69	34.5
Were you ever exposed to the training of management of hypertension in pregnancy?	143	71.5	57	28.5

Table 6. Challenges faced by midwives in the implementation of maternal guidelines n = 200.

	Yes		No		Don't know	
Question	Frequency	%	Frequency	%	Frequency	%
Does the number of professional midwives correlate with the number of pregnant women seen on a daily basis?	36	18	155	77.5	9	4.5
Do you sometimes experience a burden of workload?	175	87.5	25	12.5	0	0
Do you have the basic essential equipment, such as blood pressure machine to carry out your normal duties?	72	36	127	63.5	1	0.5
Were you provided with enough knowledge to manage a woman with pre-eclampsia?	176	88	22	11	2	1.0
Do you have enough drugs to manage a woman with pre-eclampsia?	149	74.5	50	25	1	0.5
Are two midwives allocated during the night to help each other?	50	25	150	75	0	0
Is the ambulance's turnaround times within the norm (less than 60 minutes)?	36	18	164	80.4	0	0

study assessed their perceived knowledge and skills on the implementation of maternal guidelines when managing women with hypertensive disorders during pregnancy. Most respondents were female because males were reluctant to offer maternal health care services; hence, most were allocated to perform other duties. A number of midwives had more than five years' experience. The incompetency was also shown by the nearly half (55.5%) of the midwives who indicated that they would not continue with Magnesium Sulphate, even when the patellar reflex was present. Failure to administer the drug predisposes pregnant women to eclampsia. Incompetency in the management of hypertensive disorders in pregnancy was also indicated by Stellenberg and Ngwekazi (10). Pattison (11), indicated that midwives must always be prepared and ready. However, their readiness will be determined by the knowledge, skills and availability of resources they have. Therefore, he recommends continuous education and training of midwives, so that they can manage emergency conditions like Pre-eclampsia. Managers must therefore organize workshops, in-service training, so that midwives can respond and provide immediate medical treatment in an emergency. The knowledge acquired and adherence to maternal guidelines will improve the health of the pregnant women. He added that, improving the skills is difficult to achieve. However, through the use of manikins, where simulation of emergency obstetric conditions is done, midwives were able to practice; hence, slowly acquire the skills needed (11).

More than half (58.5%) of the midwives failed to differentiate between the two types of hypertension in a pregnancy, which would lead to poor management of pregnant women. This means that a woman with gestational hypertension would be treated as a known patient with hypertension. As a result, midwives would not refer her to the next level; hence, complications might arise. This can affect the health of both the mother and child. The results of this study are different from those of a study conducted at the University of Stellenbosch, where many midwives had some knowledge about gestational hypertension and its management, though a few were not knowledgeable about the matter (10). Few midwives (28%) indicated that they would leave a women with eclampsia alone, in order to request for an ambulance; hence, they were putting the lives of women in danger because a women can have an attack; she can also injure herself or fall from the bed if left being alone; hence, two lives can be lost, and increase the incidences of maternal mortality rate. The guidelines indicate that the midwife must shout for help, rather than leave the woman unattended (6).

Few midwives (17%) were not aware that first-time pregnant women were also at risk of developing pre-eclampsia; hence, lack of awareness can put the lives of both the pregnant woman and the unborn baby in danger. Others indicated that they would continue with Magnesium Sulphate, even when the respiratory rate was less than 16 b/minutes. Continuing with Magnesium Sulphate at a lower respiratory rate will kill the pregnant woman rather than prevent eclamptic attacks. A study was conducted by Danchua (12) in relation to the use of Magnesium Sulphate, where participants reported that doctors working in the labour ward may attend seminars on how to administer Magnesium Sulphate. However, this knowledge is not often shared with the rest of the facility staff. The issue of possible misuse of injections, Magnesium Sulphate was also identified, as some clinicians may prescribe it before fully examining the patient, resulting in complications such as renal problems. However, various researchers have discovered that the use of Magnesium Sulphate when it is appropriate will prevent eclampsia and it is viewed as safe for the mother and baby, taking into account the respiratory rate of the women (13–15).

The Department of Health (6), in the maternity guidelines, has indicated that a pregnant woman with pre-eclampsia must be stabilised by giving her anti-

hypertensive and anti-eclamptic drugs before being transfer to the next level of care. Giving the pregnant woman the anti-eclamptic drug (Magnesium Sulphate) depends on the severity of pre-eclampsia. A woman with mild to moderate pre-eclampsia must be given Methyldopa 500mg every 8 hours and should be transferred to the hospital the same day. Confirmation of protein in urine must be done with a 24 hour urine specimen (6). A woman with severe pre-eclampsia to imminent eclampsia are given the same dose of Methyldopa. In addition, they must be given Magnesium Sulphate 4grams in 200mls of Ringers Lactate. If there is a delay in the transportation of the woman to the hospital of four hours or more, additional doses of Magnesium Sulphate namely; 5 grams should be given intramuscularly on each buttock, making a total of 14 grams. Depending on the blood pressure, if severe (diastolic of 110 and more), Nifedipine 10 mg should be given orally. Hence, 17.5% of midwives indicated that they would not give any pre-referral drugs. Stabilizing the women by giving them drugs will reduce the blood pressure and lower the women's chances of experiencing eclamptic attacks. A study was conducted in Nigeria by Danchua (12) related to the competencies of health care professionals in the provision of maternal health in primary health care facilities; the researcher discovered that some health care workers lacked the knowledge and skills in the management of maternal health care services. Most of the health care workers were offering inadequate health care services and were incompetent because they had no training in maternal care. This lead to poor implementation of the maternal guidelines, which increases maternal mortality rate. Dissemination of information to pregnant women was also poor (12). A study conducted in South Africa at primary health care facilities yielded different results. The midwives were found to be competent and were following guidelines when rendering maternal health care services, and as such, the results were good maternal outcomes (16).

The results of the current study showed that more than half (64.5%) of the midwives were trained on ESMOE, which included hypertension in pregnancy; those who did not receive the training could not implement the guidelines successfully because they lacked the knowledge and skills to do so. Various researchers have recommended continuous education of all midwives in order to capacitate them with knowledge; hence, knowledgeable health care personnel who can provide proper maternal health care services are required. Managers must organize workshops and in-service training, so that midwives can respond and provide immediate medical treatment under emergency conditions, such as pre-eclampsia (10,11,17,18).

Although most professional nurses had received midwifery basic training, the number of pregnant women did not correlate with the number of available midwives that were providing maternal health care services. This was caused by the shortage of midwives. The shortage of midwives was found to be a barrier that hindered midwives from implementing maternal health guidelines (19–21). The Royal College of Midwives (22) conducted a survey on maternal health care managers. Their main questions were on the availability of staff; how they recruited and retained staff, staff motivation and morale, and management of the budget through a reduction of costs. From the results, the Chief Executive Officer, Warwick (23), indicated that there was an overload of staff, reduction of services caused by budget cuts and staff shortages. It was also indicated from the survey that midwives try their level best to keep the services running, by working long hours, overtime and sometimes they did not have their lunch. This led to compromised services and many mistakes were made because quality care services which were of a high standard were provided by the same staff (22,24). A telegraph conducted by Warwick (23) in February 2017 indicated that there was a higher rate of women who are falling pregnant and giving birth than the number of midwives to render maternal health care services on these women. Midwives were seen to be overburdened because those who trained many years ago were leaving the services and they needed replacement by younger midwives. Replacement of older midwives by younger ones sounds like a dream because the British government cancel the bursaries that they were awarded for training midwives as a means of cutting cost thus they remain with a shortage of midwives (23).

A shortage of basic essential equipment such as blood pressure machines also made the implementation of maternal guidelines ineffective. Though most midwives indicated that they were provided with enough knowledge to manage pre-eclampsia, without a blood pressure machine, management will be poor. These results were supported by various authors, who indicated that a shortage of equipment may impede the management offered by midwives (8,24). There will also be a delay in the diagnosis of hypertension, which might lead to increased maternal mortality rate. Most respondents (74, 5%) indicated that they had enough drugs to manage pre-eclampsia. However, one-fourth (25%) indicated a shortage of the drugs. Those who had a shortage of Magnesium Sulphate will not be able to manage pregnant women with pre-eclampsia, hence the women would be at risk of developing

eclampsia. The shortage of Magnesium Sulphate was caused by poor supply chain management and poor drug quality (25–27). It was found that delayed ambulance services, when called to transfer pregnant women to the hospital, leads to a delay in the initiation of treatment at the next level. Various authors have found that a shortage of transport in the form of ambulances and poor roads, as well as remote areas where patients lived, hindered health care workers from implementing the maternal health care guidelines successfully (9,17,28–30).

Recommendations

Maternal health care managers should capacitate midwives through continuous education and training. ESMOE training must also be strengthened and updates to include conditions covered by the maternity care guidelines in South Africa. Furthermore, midwives who provide care should give themselves time to study the maternity care guidelines on their own, to keep themselves updated. In addition, District executive managers should support midwives by purchasing basic essential equipment's that must be available to each consulting room. Lastly, equipment's that will facilitate Emergency Obstetric Simulation Training (EOST) drills must be purchased and distributed to each facility, so that midwives practice the skills taught during ESMOE training. Operational managers should monitor drug availability and conduct in house in-service training as a form of capacitating midwives with some knowledge. The ambulance services providers need to improve their services, by maintaining their ambulances, to avoid delay. In addition, their communication system must be accessible and open all the time, to facilitate utilisation by pregnant women.

Conclusion

The majority of the midwives were unable to identify and differentiate between essential and gestational hypertension during pregnancy. This is despite the fact that misdiagnosis may lead to wrong management of hypertensive disorders. Even though some midwives displayed accurate knowledge, skills and were competent in the management of pregnant women with pre-eclampsia, some were still incompetent. These are the midwives who need in-service training and mentoring. Many midwives had been trained on management of hypertension in pregnancy and ESMOE. However, some were yet to be trained. The midwives experienced challenges when in need of transferring pregnant women to the hospital because of delayed ambulance services. The shortage of resources in the form of midwives leads to increased workload. Furthermore, shortage of drugs and basic equipment's were also discovered.

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Authors' contributions

The project was funded by the South African Medical Research Council (SAMRC). The project leader was L.M.N, I.T.R was a PhD student recruited into the project and M.S.M was a Promoter with D.U.R and R.T.L were co-promoters. The student under supervision was involved in conceptualisation, data collection, analysis and report writing and drafting of the article L.M.N, R.T.L and D.U.R conducted the literature search, and all project team finalised the article.

Data Availability statement

The raw data used to support the findings of this study are included within the article and can also be obtained from the corresponding author upon request.

Disclosure statement

The authors declare that they have no financial or personal relationship(s) which may have inappropriately influenced them in writing this article.

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References

[1] Department of Health. Saving mothers report 2005–2007, fourth report on confidential enquiries into maternal deaths in South Africa, NCCEMD. Pretoria: Government Printers; 2008, WHO press.
[2] World Health Organisation. Who recommendations for prevention and treatment of pre-eclampsia and Eclampsia. Geneva; 2011.
[3] Department of Health. Saving mothers 2011–2013: sixth Report on confidential enquiries into maternal deaths in South Africa, NCCEMD. Pretoria: Government Printers; 2014.
[4] Thangaratinam S, Coomarasamy A, O'Mahony F, et al. Estimation of proteinuria as a predictor of

complications of pre-eclampsia: a systematic review. BMC Med. 2009;7(1):10.
[5] Chou D, Daelmans B, Jolivet RR, et al. Ending preventable maternal and newborn mortality and stillbirths. BMJ. 2015;351. DOI:10.1136/bmj.h4255
[6] Department of Health. Guidelines for Maternity Care in South Africa. A Manual for Clinics, Community Health Centres and District hospitals, 4th Ed.; 2016.
[7] Department of Health. Guidelines for Maternity Care in South Africa. A Manual for Clinics, Community Health Centres and District hospitals, 3rd Ed.; 2014.
[8] Banchani E, Tenkorang EY. Implementation challenges of maternal health care in Ghana: the case of health care providers in the Tamale Metropolis. BMC Health Serv Res. 2014;14(1):7.
[9] Silal SP, Penn-Kekana L, Harris B, et al. Exploring inequalities in access to and use of maternal health services in South Africa. BMC Health Serv Res. 2012;12(1):120.
[10] Stellenberg EL, Ngwekazi NL. Knowledge of midwives about hypertensive disorders during pregnancy in primary health care. Afr J Prim Health Care Fam Med. 2016;8(1):1–6.
[11] Pattinson N. The midwife's approach to postpartum haemorrhage. Chapter nine of the Monograph. USA: University of Colombia; 2010. Available from: http://www.hst.org.za/
[12] Danchua AA. Knowledge of and challenges experienced by health workers managing maternity patients in primary health care clinics of Yobe state, Nigeria. Unpublished Dissertation submited at Wits for the fulfillment of Master of Science in Nursing education. Nigeria: University of Nigeria; 2014.
[13] Kattah AG, Garovic VD. The management of hypertension in pregnancy. Adv Chronic Kidney. 2013;20 (3):229–239.
[14] Crowther CA, Brown J, McKinlay CJ, et al., 2014. Magnesium sulphate for preventing preterm birth in threatened preterm labour. The Cochrane Library. Available from: http://www.cochrane.org/CD001060
[15] Payne BA, Hutcheon JA, Ansermino JM, et al. A risk prediction model for the assessment and triage of women with hypertensive disorders of pregnancy in low-resourced settings: the mini PIERS (Pre-eclampsia Integrated Estimate of Risk) multi-country prospective cohort study. PLoS Med. 2014;11(1):e1001589.
[16] Visagie S, Schneider M. Implementation of the principles of primary health care in rural area of South Africa. Afr J Prim Health Care Fam Med. 2014;6(1): Art, #562, 10.
[17] Van Lonkhuijzen L, Dijkman A, van Roosmalen J, et al. A systematic review of the effectiveness of training in emergency obstetric care in low resource environments. BJOG. 2010;117(7):777–787.
[18] Lee AC, Cousens S, Darmstadt GL, et al. Care during labor and birth for the prevention of intrapartum-related neonatal deaths: a systematic review and Delphi estimation of mortality effect. BMC Public Health. 2011;11(3):S10.
[19] Bramham K, Nelson-Piercy C, Brown MJ, et al. Postpartum management of hypertension. BMJ. 2013;346:f894.
[20] Ward J. Nine common problems in the nursing profession. New York; 2014. Available from: http://www.Nursetogether.com
[21] Mahnava P, Durrant K, Luchters S. Attitude and behaviours of maternal health care providers in interactions with clients: a systemic review NCBI-NIH. 2015. Available from: http://www.ncbi.n/m.nih.gov
[22] The Royal College of Midwives. Maternity services overworked, understaffed and struggling to cope shows senior midwives survey Maternity. Presented by Amy Leversidge, 15 Mansfield St, London; 2015.
[23] Warwick C The challenges facing midwifery are immense. No wonder we have a crisis on our hands. The telegraph Health and Fitness news, United Kingdom. 2017. Available from: http://www.tegraph.co.uk
[24] Scheffler E, Visagie S, Schneider M. The impact of health service variables on health care access in a low resourced urban setting in the Western Cape, South Africa. Afr J Prim Health Care Fam Med. 2015;7 (1):1–11.
[25] Bateman C. Drug stock-outs: inept supply-chain management and corruption. SAMJ. 2013;103(9):600–602.
[26] Mkoka DA, Goicolea I, Kiwara A, et al. Availability of drugs and medical supplies for emergency obstetric care: experience of health facility managers in a rural District of Tanzania. BMC Pregnancy Childbirth. 2014;14(1):108.
[27] Samal J, Dehury RK. Challenges faced by health workers in providing maternity management and family planning services in Assam. J Health Res Rev. 2015;2(3):90.
[28] Gaede B, Versteey M The state of the right to health in rural South Africa. 2011. Available from: https://rhap.org.za
[29] Vogel JP, Moore JE, Timmings C, et al. Barriers, facilitators and priorities for implementation of WHO maternal and perinatal health guidelines in four lowerincome countries: a GREAT network research activity. PLoS ONE. 2016;11(11):e0160020.
[30] Newton PR, Naidoo R, Brysiewicz P. The appropriateness of emergency medical service responses in the eThekwini district of KwaZulu-Natal, South Africa. SAMJ. 2015;105(10):844–847.