



Clinical Audit of Normal Labor at Al Azhar University Hospitals

Elsayed Eldesouky¹, Ashraf Elshahat¹, Sileem Ahmed Sileem², Abdelhalim Mohammed²

¹Department of Obstetrics and Gynecology, Faculty of Medicine, Al-Azhar University, Cairo, Egypt.

²Department of Obstetrics and Gynecology, Faculty of Medicine, Al-Azhar University, Assuit, Egypt.

elsayedeldesouky@yahoo.com

Abstract: Background: Clinical auditing is a quality improvement process that involves reviewing the delivery of healthcare to ensure the best practice is being carried out. **Objective:** This work is aiming at auditing the current management of normal vaginal delivery at **Al Azhar University Hospitals** to improve emergency obstetric care. **Methodology:** This study has been undertaken in **Al Azhar University Hospitals** in the period between 1/7/2018 to 31/4/2019. This audit was conducted as cross sectional study that is planned to include 300 cases of normal deliveries. Policies and routines of normal labour and delivery practiced in maternity wards of **Al Azhar University Hospitals** was Compared with criteria and standards of ACOG guidelines. **Results:** During management of the first stage of labour, communications between the care-givers with women and her companions were missing in 89% of cases. Also, giving woman information and explanation was missing in 46.3% of cases. Using noninvasive and non-pharmacological methods of pain relieve during labour was missed in 99% of cases. bed rest after rupture of membrane was not done in 46% of cases. During management of the second stage of labour, woman, choice for position was not supported in 83% of cases. Also, continuous emotional and physical support to woman throughout labor in 19% of cases. Regarding episiotomy, skin was sutured continuously and no episiotomy suturing by vicryl in 100% of cases. Regarding management of third stage of labour, oxytocin was administered mostly by intravenous drip. Cord traction was mostly steady. During fourth stage of labour, close monitoring and surveillance of the woman at first 6 hours after labour was done. Hand washing before dealing with the baby was missed. **Conclusion:** That there are missing important aspects of appropriate care especially those related to appropriateness of care givers- patients interaction, safety and completeness of examinations, and appropriateness of postpartum care. [Elsayed Eldesouky, Ashraf Elshahat, Sileem Ahmed Sileem, Abdelhalim Mohammed. **Clinical Audit of Normal Labor at Al Azhar University Hospitals.** *Life Sci J* 2019;16(11):10-18]. ISSN: 1097-8135 (Print) / ISSN: 2372-613X (Online). <http://www.lifesciencesite.com>. 2. doi:[10.7537/marlsj161119.02](https://doi.org/10.7537/marlsj161119.02).

Keywords: Clinical Audit, Management of normal vaginal delivery, Improve emergency obstetric care.

1. Introduction:

Pregnancy and childbirth are normal events in the life of a woman. Though most pregnancies result in normal birth, it is estimated that about 15% may develop complications, which cannot be predicted. Some of these may be life threatening for the mother and or her baby ⁽¹⁾.

The presence of skilled attendants is therefore, crucial for the early detection and also for appropriate and timely management of such complications ⁽²⁾.

The principal aim of audit is to improve the quality of medical care. The most commonly quoted definition of audit is: "The systematic and critical analysis of the quality of medical care, including the procedures used for diagnosis and treatment, the use of resources and the resulting outcome and quality of life for the patient ⁽³⁾.

This definition highlights two key features of the process of audit. First, audit involves a criticism of current practice. Second audit is not restricted to the technical accuracy of diagnosis or treatment but also

involves diverse issues such as for example the timeliness of interventions, the appropriateness of referral, the attitudes of staff or the information given to the patient ⁽⁴⁾.

Recently researchers have used the woman's self-report as the time of labor onset ⁽⁵⁾. The care that a woman receives during labour has the potential to affect her both physically and emotionally the short and longer term ⁽⁶⁾.

The World Health Organization (WHO) states that the aim of intrapartum care is achieving a healthy mother and child using the least possible number of interventions consistent with safety ⁽⁷⁾.

Despite the scientific and medical advances for management of complicated health issues, the current maternity care setting has increased risks for healthy women and their babies ⁽⁸⁾.

There are worries all over the world that non-evidence-based interventions and practices during labor and delivery remain the standard practice ⁽⁹⁾.

So, there remains a widespread underuse of beneficial practices, overuse of harmful or ineffective practices, and hesitancy about the effects of insufficiently, inadequately evaluated practices⁽¹⁰⁾.

Therefore, improving the quality of maternity care in both developed and developing countries is an important part of attempts made to decrease maternal and neonatal mortality and morbidity⁽¹¹⁾.

One of the best approaches for quality improvement of care in clinical environments with limited resources is application of evidence-based standards for management of spontaneous vaginal births⁽¹²⁾.

Aim of the work:

Auditing the current management of normal vaginal deliveries at **Al Azhar University Hospitals** emergency obstetric care.

2. Materials and Methods:

Settings:

This thesis will be undertaken in **Al Azhar University Hospitals** in the period between 1/7/2018 to 31/4/2019.

Patients:

This audit was conducted as cross sectional study that was planned to include 300 cases of normal deliveries fulfilling the following inclusion criteria.

Inclusion Criteria:

1. Term (37-43 weeks)
2. Single
3. Vertex presentation
4. Living fetus
5. Spontaneous onset
6. No contraindication for vaginal delivery

Exclusion criteria

1. Women with associated co-morbidities (pre-eclampsia or diabetes) multiple pregnancies
2. Preterm labor
3. HFD
4. Previous uterine scar
5. Intrauterine growth restriction
6. Operative delivery

Methods:

Data sources:

In the present work we are planning to collect our data through direct personal-patient contact, direct observation of care givers, patient interactions and attitudes, and recording of data in special check list sheet for every patient.

The check list sheet will constructed from data obtained from different sources with special emphasis on those supported by Cochrane Library reviews⁽¹³⁾.

This check list divided mainly in to 3 main parts. The first part deals with the process of history taking. The second part deals with the steps of physical examination including general, abdominal, and pelvic

examination. The third part with management of normal labor including management of the first, second, third, and fourth stages of labor.

Data collection:

Verbal permission was taken from every patient to assess eligibility of the case for the study. Then the eligibility questions that addressed the inclusion and exclusion criteria were asked. Thereafter if case was found eligible, the check list was completed via direct observation of the care givers-patients interactions.

For every item in the check list, the candidate observed the caregiver-patient interaction and ticks the corresponding box with yes if it done or crosses if not done.

Data analysis:

Data entry in Excel sheet.

Data analysis by SPSS 11 program.

Descriptive statistics:

1- Descriptive of qualitative variables by frequency (Number. Percentage).

2- Descriptive of quantitative variables by (Mean, SD, Minimum, maximum).

Analytic statistics:

1- Significant tests (Chi square for categorical data, T-tests and ANOVA for numerical data).

2- Association (correlation).

In the present audit, we compared normal labour management and performance in **Al Azhar University Hospitals** with American College of Obstetricians and Gynecologists (ACOG) guidelines.

Auditing the hospital according to ACOG guidelines:

- Emergency room
- Labour room
- Postnatal room
- Infection control in the hospital
- level of sterilization
- heigene
- bed sheets, clothes, leggings
- ground cleaning
- WC
- Water supplies
- Capacity of paramedical staff
- Medical recording system
 - Manual or computerize
 - Informative or not
- Laboratory
- Blood banks
- Availability of other speciality for emergency (e.g. surgery, urology, vascular and cardiology).

3. Results:

Table (1) shows personal data of mothers in **Al Azhar University Hospitals**. This table shows that 39.3% of mothers in **Al Azhar University Hospitals**

aged < 25 years. As regard residence, about two-thirds of the mothers (65%) were from rural areas. Regarding to gravidity, 36.5% of women were gravida of 4 or more. Regarding to parity about 50% of women were Para 2 or more. About 80% of women delivered in the hospital have no abortions.

Table (2) shows that last menstrual period, expected date of delivery, gestation and abnormal symptoms were taken in more than 90% of cases. Other items like investigations done were taken in 61% of cases. Asking about membrane rupture and vaginal bleeding were about 90% of cases. Asking about past pregnancy problems was 62.3%.

Table (1): Personal data of the studied women in Al Azhar University Hospitals

Personal data		Al Azhar University Hospitals (n = 300).	
		No.	%
Age (years)	< 25	118	39.3
	25- < 30	96	32.0
	30 or more	86	28.7
Residence	Rural	195	65.0
	Urban	105	35.0
Gravidity	PG	84	28.0
	2 – 3	107	35.7
	4 or more	109	36.3
Parity	None	86	28.7
	Once	58	19.3
	Twice or more	156	52.0
Abortion	None	240	80.0
	Once	44	14.7
	Twice or more	16	5.3
	Average	83	27.7
	Over weight	111	37
	Obese	46	15.3

Table (2): History taking in Al Azhar University Hospitals

History	Al Azhar University Hospitals (n = 300)			
	Taken		Not	
	No.	%	No.	%
LMP	278	92.7	22	7.3
EDD	278	92.3	22	7.3
Gestation by U/S	289	96.3	11	3.7
Any abnormal symptom	287	95.7	13	4.3
Any investigation done	183	61.0	117	39.0
If Membranes ruptured or not	274	91.3	26	8.7
If There is vaginal bleeding or not	268	89.3	32	10.7
Past pregnancy problems	187	62.3	113	37.7

Table (3) shows that in 100% of cases pulse and blood pressure are measured, On the other side, height and weight are not measured in 100% of cases. Chest

and heart examination w done in 18% of cases. Lower limbs are examined for oedema in 75% of cases.

Table (3): General examination done for women in Al Azhar University Hospitals

General examination		Al Azhar University Hospitals (n = 300)			
		Done		Not	
		No.	%	No.	%
Vital signs:	Pulse	300	100.0	0	0.0
	Blood pressure	300	100.0	0	0.0
Height, weight		0	0.0	300	100.0
Chest & Heart examination		53	17.7	247	82.3
Lower limbs for oedema		227	75.7	73	24.3
Inspection for Pallor		0	0	300	100

Table (4) shows that informing the women about their conditions was 54%. Communication between the woman and her caregivers reaches to 11%. Allowing the woman to walk was about 62%. Also, preventing the woman from bearing down during the first stage reaching to 99.7%. With membrane rupture,

women were allowed to rest in bed in 54% of patients. Oral fluids were given to 82% of patients during labour. On the other side, using non-invasive, non-pharmacological methods of pain relief during labour like massage and relaxation techniques was absent.

Table (4): Management of the first stage of labour done for women in Al Azhar University Hospitals

History	Al Azhar University Hospitals (n = 300)			
	Done		Not	
	No.	%	No.	%
Give woman as much information and explanation as she desires	161	53.7	139	46.3
Facilitate good communication between caregivers, the woman and her companions	33	11.0	267	89.0
Patient is allowed to walk	187	62.3	113	37.7
Rest in bed if membranes are ruptured	162	54.0	138	46.0
The patient is not allowed to bear down	299	99.7	1	0.3
Use non-invasive, non- pharmacological methods of pain relief during labor (massage, relaxation techniques, etc.)	3	1.0	297	99.0
Pharmacological analgesics	0	0.0	300	100
Offer oral fluids throughout labor	246	82.0	54	18.0

Table (5) shows that woman's choice for position during labor was taken in 17% of women. As regard to emotional and physical support to women during labor, it was done in 81% of women. Also, washing the perineum and vulva with antiseptic solution was done in 98.3 % of patients. Emptying the bladder by sterile catheter was done in 57.7% of patients. However; patients were asked to bear down during uterine contractions, perineum was supported when

the head appears at the vulva, mouth and nose of the fetus were cleaned when head was delivered with inspection of the neck if the cord is coiled around it and trying to split it then delivery of the shoulders and trunk by gentle traction, all these steps were done to all patients. More frequent observation of fetal heart sounds was done in 51.7% of patients. Finally, the cord was massaged toward the fetus several times in 74% of patients.

Table (5): Management of the second stage done for women in Al Azhar University Hospitals

Management of the second stage	Al Azhar University Hospitals (n=300)			
	Done		Not	
	No.	%	No.	%
Support woman's choice for - position during labor and childbirth	51	17.0	249	83.0
Provide continuous emotional and physical support to woman throughout labor	243	81.0	57	19.0
Vulva & perineum are washed with antiseptic solution	295	98.3	5	1.7
Emptying bladder by sterile catheter (Sterile leggings & towels are applied)	173	57.7	127	42.3
The patient is asked to bear down during uterine contraction	300	100.0	0	0.0
More frequent observation of fetal heart sound	155	51.7	145	48.3
Perineum is supported when the [head appears at the vulva	298	99.3	2	0.7
Mouth and nose of the fetus are cleaned when head is delivered	300	100.0	0	0.0
Inspect the neck, if the cord is coiled around it, tries to split it	300	100.0	0	0.0
Delivery of the shoulders & trunk by gentle traction	0	0	300	100
The cord is massaged toward the fetus several times	222	74.0	78	26.0

Table (6) shows that oxytocin administration of 10 mg was 75% and by intramuscular route was 37% of patients. Controlled cord traction was mostly steady

(68%). Uterine massage after delivery of the placenta every 15 min was 94%. Inspection of the placenta,

cord and membranes and examination of the perineum, vulva and vagina were done to all patients.

Table (7) shows that close monitoring and surveillance during first 6 hours and care of the new born for heart rate, respiratory effort, muscle tone,

body color and correct clamping of the cord reach to 100%. Hand washing before dealing with the baby was 41.7%. As regarding to sterile dressing of the cord, the result was 100%.

Table (6): Management of the third stage done for women Al Azhar University Hospitals

History		Al Azhar University Hospitals (n=300)			
		Done		Not	
		No.	%	No.	%
Oxytocin administration	10 mg in dose	226	75.3	74	24.7
	Intramuscular route	112	37.3	188	62.7
Controlled cord traction	Firm	19	6.3		
	Steady	205	68.3		
	Gentle	76	25.3		
Uterine massage after delivery of the placenta every 15 min to keep the uterus contracted		282	94.0	18	6.0
Inspect	Placenta	300	100.0	0	0.0
	Cord	300	100.0	0	0.0
	Membranes	300	100.0	0	0.0
Examination of the cervix, vagina, vulva and perineum		300	100.0	0	0.0

Table (7): Management of the fourth stage done for women in Al Azhar University Hospitals

History		Al Azhar University Hospitals (n=300)			
		Done		Not	
		No.	%	No.	%
Close monitoring and surveillance during first 6 hours postpartum		300	100.0	0	0.0
Care of the new born for	Heart rate	300	100.0	0	0.0
	Respiratory effort	300	100.0	0	0.0
	Muscle tone	300	100.0	0	0.0
	Body color	300	100.0	0	0.0
	Hand washing before dealing with the baby	125	41.7	175	58.3
	Correct clamping of the cord	300	100.0	0	0.0
	Sterile dressing of the cord	300	100.0	0	0.0

4. Discussion:

Clinical audit is a quality improvement process that was introduced to the National Health Service (NHS) by the 1989 White Paper Working for Patients. It seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Previously known as medical audit until a name change in the early 1990's, clinical audit involves reviewing the delivery of healthcare to ensure that best practice is being carried out ⁽⁶⁾.

In the present study, we selected to audit the practice of normal labour because of the great importance of this topic. Aspects of the structure, process and outcome of care were selected and systematically evaluated against explicit criteria. Where indicated changes will be implemented at an individual, team, or service level and further monitoring will be used to confirm improvement in

healthcare delivery. In the present audit we compared the practice of normal labour in **Al Azhar University Hospitals** versus the ideal practice criteria to identify the defect or the gap and to implement a plan of improvement for the benefit of the patients. We used the American college guidelines to compare our practice with the American college recommendations for normal labour.

The current data showed that about two thirds of our study population were living in rural areas. The present work showed the parity and abortions. Studying the obstetric and current pregnancy histories in the women recruited from the **Al Azhar University Hospitals**, regarding last menstrual period taking, obtaining expected date of birth, obtaining the gestational age by sonographic estimation, asking about any abnormal symptoms, doing any investigation, asking about occurrence of premature

rupture of membranes, asking on vaginal bleeding and asking on occurrence of past pregnancy problems.

Regarding general examination, pulse and blood pressure were measured nearly in all patients on arrival. On the other hand, measuring height and weight was not done. Although the tools for these examinations are so simple (a scale a graduated stand) yet were not available in **Al Azhar University Hospitals**. Measurement of weight and height and calculation of BMI are of great importance in identification of cases at risk of high BMI related complications. Some of these complications are life threatening e.g. thromboembolism. Such lethal complications could be avoided by simple prophylactic measures (anticoagulant therapy) in addition the prediction and anticipation of shoulder dystochia is possible via measuring BMI this would avoid the drastic consequences of this problem⁽¹⁴⁾.

The results of present study showed also some missing simple items in general examination as the general assessment should be careful and comprehensive. General look should emphasize search for pallor although it is a simple sign to be assessed, but it is very important to diagnose anemia. There are also drastic sequelae to anemia namely two of them are certainly grave, firstly infection and secondly postpartum hemorrhage⁽¹⁵⁾.

Also, chest and heart examination was defective (17%) although it is important for hearing murmurs of the heart, wheezes of the chest and for detection of nipple abnormalities. The results of the present study showed that care-givers attention to chest examination and heart examination was poor, in spite that performing chest and heart examination at the time of delivery in our setting may be more important than anywhere else as our pregnant women are lacking antenatal care and had no enough time during antenatal visits to discover any general diseases that she may suffer from. Ignorance of the importance of this item, lack of guidelines may be the cause behind this problem that should be addressed in any further training program. In this respect, **Wei et al.** has reported that perfect care or standard care of patients requires attention to the missed major advantage of no negligence of chest and heart examination⁽¹⁵⁾.

The present study showed that abdominal examination was done in the majority of cases (98%). Auscultation of foetal heart sounds by Pinard's stethoscope was done to every case in **Al Azhar University Hospitals** on arrival and if there was any abnormality the patient was referred to foetal heart monitoring unite. Frequent observation of fetal heart sounds is highly recommended. In addition, periodic changes in relation to uterine contraction should be noted⁽¹⁷⁾.

For pelvic examination, hand washing was done before vaginal examination in 73% of cases. Some care givers think that wearing sterile gloves without washing the hands before examination is sufficient for infection control. This concept has to be changed as hand washing before wearing sterile gloves as a basic step for infection control⁽¹⁸⁾.

Using noninvasive and non-pharmacological methods of pain relieve like alleviation of fear, giving the woman the chance to take the most comfortable position that she feels less pain with it during labour, massage, relaxation techniques and water immersion was not used. According to the American college, these activities can be done by anyone and at any time with minimal cost⁽¹⁹⁾. But this needs time experience intent to change and implementation of clear guide lines. In fact, even invasive techniques of pain relieve like inhalation analgesics, epidural, spinal or regional anaesthesia are not used now in **Al Azhar University Hospitals** although experience is present but unfortunately there are no clear guidelines for implementing these activities.

Observations of the woman at **Al Azhar University Hospitals** were good. Blood pressure is measured at arrival to identify preeclampsia, measuring pulse, blood pressure every 2 hours and observing fetal heart sounds every 30 minutes was reaching to 89%. Of course vital signs monitoring is of curtail importance and missing this basic requirement is a major concern that needs a radical change. Pinard's or Sonicade stethoscope must be present at labour unit to monitor foetal heart sounds during labour⁽²⁰⁾.

Taking partograph and completing it was 86% and 60% consecutively. According to the American college, Partograph must be used and completed with every woman to identify prolonged and complicated labour (for the benefit of the mother and the baby), making the decision to transfer the patient to a higher level of obstetric care, making the decision to augment labour by oxytocin, and early recognition of cephalopelvic disproportion⁽²¹⁾.

Sterile towels and leggings were used with every woman delivered in **Al Azhar University Hospitals**. So this is useful in the control of infection especially if episiotomy is needed or if operative delivery is done⁽²²⁾.

Regarding episiotomy, skin was usually taken by continuous sutures (93% of cases of episiotomy). This was because of large number of cases, but according to the American college, this may cause flaring of infection. If infection occurs in one suture, it will spreads to the other sutures⁽⁵⁾. Also, suturing was taken by chromic sutures. Although vicryl sutures are better as they are absorbed after 2-3 months compared to 7 days the absorption time of chromic sutures. The

delayed absorbable material may rarely result in painful scar, but chromic sutures are cheaper than vicryl sutures⁽²³⁾.

Usage of oxytocin during management of third stage of labor was done in 75% of cases, oxytocin was usually given by intravenous drip in the solution (62.7%) after delivery of the fetus to control postpartum hemorrhage. According to the American college, the response to intravenous oxytocin depends on gestational age, cervical dilatation and parity⁽²⁰⁾.

In **Al Azhar University Hospitals**, woman who delivered underwent close surveillance and monitoring for six hours. Uterine massage was done every 15 minutes in 94% of cases to keep the uterus contracted and to discover any post-partum hemorrhage. According to the American college, after delivery of the placenta, the uterine fundus contracts down to the level of the maternal umbilicus and should be palpated for firmness⁽²⁴⁾. The cervix, vagina, vulva and perineum are also inspected for lacerations and/or trauma and are repaired accordingly. Most patients were observed for one to two hours post-delivery to ensure that vaginal bleeding has slowed and vital signs are stable.

Also, hand washing before dealing with the baby was defective (42%) as nurses depend on wearing sterile gloves thinking that it will be sufficient to prevent infection. Correct clamping of the cord was done with sterile dressing of the cord which is important to prevent any contamination⁽⁶⁾.

In a similar study at Elgalaa hospital it was found that many common practices routinely followed are not evidence based, and beneficial practices are often neglected or inappropriately applied and harmful or practices of unproven benefits are widespread⁽²⁵⁾.

Conclusion

Since audit is the utilization of proven techniques to improve services to patients which consequently enhance the overall success of the practice. In addition, audit is not about coercion; it should not be seen as threatening and it should be seen instead as an opportunity.

We concluded that there are missing important aspects of appropriate care especially those related to appropriateness of care givers- patients interaction, safety and completeness of examinations, and appropriateness of postpartum care.

Advantages in performance at Al Azhar University Hospitals:

- Regarding history taking, general examination, measuring the vital signs was completed in the hospital.
- Steps of abdominal examination were completed. Regarding pelvic examination, consent

taking and other steps of pelvic examination were completed.

- During fourth stage of labour, close monitoring and surveillance of the woman at first 6 hours after labour was done.

Disadvantages in performance at Al Azhar University Hospitals:

- No check for weight and height in 100%
- No chest examination in 82%
- No assessment of lower limb in 24%
- No washing hands before wearing gloves in 27%
- No wearing sterile gloves in 27%
- No giving information and explanation in 46.3%
- No communication between caregivers, the woman and her companions in 89%
- No bed rest after rupture of membrane in 96%
- No intrapartum analgesia in 100%
- No observation of fetal heart sound every 30 minutes in 11%
- No observation for maternal pulse, temp, blood pressure every two hours in 11%
- No partograph in 14%
- No completed partograph in 39.7%
- No support woman's choice for – position during labor and childbirth in 83%
- No continuous emotional and physical support to woman throughout labor in 19%
- No emptying bladder by sterile catheter in 42.3%
- No episiotomy suturing by vicryl in 100%

Recommendations

From this audit, we recommend the following points to be taken in consideration at **Al Azhar University Hospitals**:

1. Development and implementation of practice guidelines and management protocols.
2. The use of partograph during labour and attention to infection control measures should be particularly stressed.
3. Re-auditing by directly observing practices using a specially developed checklist as this is the only way to accurately record actual practices.
4. Direct observations that may reveal a divergence between actual practices and evidence-based medicine.
5. Short targeted training can improve both intrapartum and postpartum facility care. Interventions in the form of regular provider training and assessment are much needed as well.
6. Full investigation for all women.

7. Checking for weight and height for all women.
8. Chest examination.
9. Assessment of lower limb edema.
10. Washing hands before wearing gloves.
11. Wearing sterile gloves.
12. Giving more information and explanation for the patients.
13. Facilitate good communications between caregivers, the woman and her companions.
14. Bed rest after rupture of membrane.
15. Monitoring of fetal heart sound every 30 minutes.
16. Monitoring of maternal pulse, temp, blood pressure every two hours.
17. Using partograph.
18. Support woman's choice for positions during labor.
19. Continuous emotional and physical support to woman during labor.
20. Emptying of bladder by sterile catheter.

References

1. Cappell, M. S. (2017). Obstetrics: Normal and problem pregnancies.
2. Domino, M., Pawlinski, B., Gajewska, M., Jasinski, T., Sady, M., & Gajewski, Z. (2018). Uterine EMG activity in the non-pregnant sow during estrous cycle. *BMC veterinary research*, 14(1), 176.
3. Verla, T. Y. N., Ojong-Alasia, M. M., Sama, J. D., Tumasang, E. N., Ndipowa, J. C., & Atanga, M. B. S. (2016). Various Health Care Providers' Knowledge of the Partogram Use during Childbirth, at the Bamenda Health District, Cameroon. *Asian Journal of Medicine and Health*, 1-12.
4. Fruscalzo, A., Mazza, E., Feltovich, H., & Schmitz, R. (2016). Cervical elastography during pregnancy: a critical review of current approaches with a focus on controversies and limitations. *Journal of Medical Ultrasonics*, 43(4), 493-504.
5. Chandler, D., Paschall, R., Robichaux, L., Beakley, B., Cornett, E. M., & Kaye, A. D. (2018). Obstetric Anesthesiology. In *Essentials of Regional Anesthesia* (pp. 397-429). Springer, Cham.
6. Oladapo, O. T., Tunçalp, Ö., Bonet, M., Lawrie, T. A., Portela, A., Downe, S., & Gülmezoglu, A. M. (2018). WHO model of intrapartum care for a positive childbirth experience: transforming care of women and babies for improved health and wellbeing. *BJOG: An International Journal of Obstetrics & Gynaecology*, 125(8), 918-922.
7. Albolino, S., Daghiana, G., Illiano, D., Tanzini, M., Ranzani, F., Bellandi, T.,... & Tartaglia, R. (2018). Safety and quality in maternal and neonatal care: the introduction of the modified WHO Safe Childbirth Checklist. *Ergonomics*, 61(1), 185-193.
8. Gul, A., & Gul, M. (2019). Intracutaneous sterile water injection for pain relief during extracorporeal shock wave lithotripsy: comparison with diclofenac sodium. *Urolithiasis*, 1-6.
9. Myrick, T. G., & Sandri, K. J. (2018). Epidural analgesia and any vaginal laceration. *The Journal of the American Board of Family Medicine*, 31(5), 768-773.
10. Liu, Z., Wang, Y., Yan, J., Li, J., Liu, X., Zhang, L., & Cheng, L. (2018). Uterine artery embolization versus hysterectomy in the treatment of refractory postpartum hemorrhage: a systematic review and meta-analysis. *The Journal of Maternal-Fetal & Neonatal Medicine*, 1-13.
11. Hayek, S. M., McEwan, M. T., Veizi, E., Roh, J., Ali, O., Katta, S.,... & Deer, T. R. (2019). Effect of Long - Term Intrathecal Bupivacaine Infusion on Blood Pressure. *Neuromodulation: Technology at the Neural Interface*.
12. Chaemsaitong, P., Kwan, A. H., Tse, W. T., Lim, W. T., Chan, W. W., Chong, K. C.,... & Poon, L. C. (2019). Factors that affect ultrasound-determined labor progress in women undergoing induction of labor. *American journal of obstetrics and gynecology*, 220(6), 592-e1.
13. Cohen, R. B. (2018). 12 The new international division of labor, multinational corporations and urban hierarchy. *Urbanization and urban planning in capitalist society*, 7.
14. Ghorbani, P., Troëng, T., Brattström, O., Ringdal, K. G., Eken, T., Ekbohm, A., & Strömmer, L. (2019). Validation of the Norwegian survival prediction model in trauma (NORMIT) in Swedish trauma populations. *British journal of surgery*.
15. Parbey, P. A., Tarkang, E., Manu, E., Amu, H., Ayanore, M. A., Aku, F. Y.,... & Kweku, M. (2019). Risk Factors of Anaemia among Children under Five Years in the Hohoe Municipality, Ghana: A Case Control Study. *Anemia*, 2019.
16. Wei, J., Liu, X., Xue, H., Wang, Y., & Shi, Z. (2019). Comparisons of Visceral Adiposity Index, Body Shape Index, Body Mass Index and Waist Circumference and Their Associations with Diabetes Mellitus in Adults. *Nutrients*, 11(7), 1580.

17. Bila, J., Plesinac, S., Vidakovic, S., Spremovic, S., Terzic, M., Dotlic, J., & Kalezic Vukovic, I. (2019). Clinical and ultrasonographic parameters in assessment of labor induction success in nulliparous women. *The Journal of Maternal-Fetal & Neonatal Medicine*, 1-8.
18. Dilley, J., Gentry-Maharaj, A., & Menon, U. (2016). Gynaecological surveillance in high risk women. *Minerva ginecologica*, 68(5), 497-508.
19. Munthe - Kaas, H., Berger, B. O., Allanson, E. E., Tunçalp, Ö., & Bohren, M. A. (2016). Perceptions and experiences of labour companionship: a qualitative evidence synthesis. *The Cochrane database of systematic reviews*, 2016(12).
20. Bostanci, E., Kilicci, C., Ozkaya, E., Abide Yayla, C., & Eroglu, M. (2018). Continuous oxytocin versus intermittent oxytocin for induction of labor: a randomized study. *The Journal of Maternal-Fetal & Neonatal Medicine*, 1-6.
21. Smith, V., Begley, C., Newell, J., Higgins, S., Murphy, D. J., White, M. J.,... & Devane, D. (2019). Admission cardiotocography versus intermittent auscultation of the fetal heart in low - risk pregnancy during evaluation for possible labour admission—a multicentre randomised trial: the ADCAR trial. *BJOG: An International Journal of Obstetrics & Gynaecology*, 126(1), 114-121.
22. Subramaniam, A., Tita, A. T., & Rouse, D. J. (2019). *Obstetric Management of Labor and Vaginal Delivery*. Chestnut's Obstetric Anesthesia E-Book, 393.
23. Battalen, A. W., Sellers, C. M., McRoy, R., & Grotevant, H. D. (2019). Birth Mothers Now Birth Grandmothers: Intergenerational Relationships in Open Adoptions. *Adoption Quarterly*, 22(1), 53-74.
24. Ali-Saleh, M., Lavie, O., & Abramov, Y. (2019). Evaluation of blood type as a potential risk factor for early postpartum hemorrhage. *PloS one*, 14(4), e0214840.
25. Thorneloe, B., Carvalho, J. C. A., Downey, K., & Balki, M. (2019). Uterotonic drug usage in Canada: a snapshot of the practice in obstetric units of university-affiliated hospitals. *International journal of obstetric anesthesia*, 37, 45-51.

9/30/2019