ANATOL J FAMILY MED
The Anatolian Journal of Family Medicine

Original Article

DOI: 10.5505/anatoljfm.2020.52724
Anatol J Family Med 2021;4(3):232–237

# Quality of Antenatal Care Services in Primary Healthcare Centers in the Federal Capital Territory, Abuja, Nigeria: A Cross-sectional Study

Victoria Nkiru Azodoh,[1] Yinyinade Macellina Ijadunola,[1] Moyosola Bamidele[2]

[1]Department of Community Health, Obafemi Awolowo University, Osun, Nigeria
[2]EUCLID University, School of Global Health & Bioethics, The Zambia

## ABSTRACT

**Objectives:** Antenatal care (ANC) services enhance access to providing care for pregnant women to prevent complications that could endanger the lives of the mother and unborn baby. The aim of the study was to assess the quality of ANC services in primary healthcare centers (PHCC) in the Federal Capital Territory (FCT), Abuja, Nigeria.

**Methods:** This cross-sectional study was conducted among health professionals spanning four of the 48 PHCC and 386 pregnant women who applied to the ANC, based on the geographic area of Abuja Municipal District Council, FCT, Abuja, Nigeria. Independent variables such as sociodemographic and dependent variables such as patient satisfaction was evaluated in this study.

**Results:** A total of 386 ANC users were included in the study, and 219 (56.7%) of the pregnant women were middle-income. A total of 356 (92.2%) received testing for urinalysis, 359 (93.0%) received blood tests and 187 (48.4%) were provided with deworming drugs. Two hundred ninety-seven (76.9%) were satisfied with services received and 140 (43.6%) attended ANC 3 times or more.

**Conclusion:** The levels of necessary standard ANC quality in primary healthcare settings have been suboptimal. A need exists for a deepened commitment by the national, state, local, and community governments in Nigeria as well as other partners to ensure that the main components of ANC are received. Health workers in FCT still provide substandard ANC services with reduced satisfaction among users.

**Keywords:** Antenatal care, patient satisfaction, pregnant women

**Please cite this article as:** Azodoh VN, Ijadunola YM, Bamidele M. Quality of Antenatal Care Services in Primary Healthcare Centers in the Federal Capital Territory, Abuja, Nigeria: A Cross-sectional Study. Anatol J Family Med 2021;4(3):232–237.

**Address for correspondence:** Dr. Victoria Nkiru Azodoh. Department of Community Health, Obafemi Awolowo University, Osun, Nigeria

**Phone:** 08184472372

**E-mail:** vickyazodoh@gmail.com

**Received Date:** 29.02.2020
**Accepted Date:** 07.09.2020
**Published online:** 29.12.2021



## INTRODUCTION

The global maternal mortality ratio (MMR), which is the number of maternal mortality per 100.000 live births, declined by 44% from 385 to 216 mortality per 100.000 live births between 1990 and 2015.[1] This was less than half the expected 5.5% annual rate of decline that was needed to achieve the three-quarters reduction in maternal mortality target of the Millennium Development Goal 5. The number of mortalities in women from pregnancy-related causes remains globally high despite a substantial decline in maternal mortality. In 2015, approximately 303.000 (830 women per day) women expired due to pregnancy- and childbirth-related causes. The majority of these mortalities occurred in low-resource settings and were mostly preventable.[2]

In sub-Saharan Africa, MMR halved in several countries over 25 years. However, better progress was made in Asia and North Africa.[1] The major complications that account for nearly 75% of all maternal mortalities are postpartum hemorrhage, infections, high blood pressure during pregnancy (pre-eclampsia and eclampsia), complications from delivery, and unsafe abortion. Other causes are associated with diseases such as malaria and acquired immunodeficiency syndrome (AIDS) during pregnancy.[3]

Nigeria makes up only 2% of the world's population but accounts for 14% of the global maternal mortality burden. Moreover, Nigeria made no progress toward reducing MMR with 576 per 100.000 live births (approximately 52.000 women expire each year) between 1990 and 2015. This translates to one in every nine maternal deaths worldwide.[4-6]

The essence of antenatal care (ANC) is to prepare women for birth, parenthood, and prevent problems for pregnant women, mothers, and babies through early detection, alleviation, and/or management of pregnancy complications.[7,8] It also depends on the functional and operational continuum of care with affordable, accessible, and high-quality care during and after pregnancy and childbirth.[7-10] Thus, ANC can reduce maternal mortality rate if provided in the right quality through competent administration of the components of ANC services.[7,8] In addition, important components must be provided for ANC to be effective. Pregnancy should be a positive experience for all women and they should receive care that respects their dignity.[7,8,11] The 2016 World Health Organization (WHO) ANC model recommends a minimum of eight ANC contacts with the first contact scheduled to take place in the first trimester.[11-13]

Literature is replete on whether or not ANC coverage has actually improved the quality of services in Nigeria.[2,14] This has been attributed to free ANC services rendered in some parts of the country.[2,5] User characteristics influencing receipt of good quality ANC with a view of informing stakeholders in ANC programming and funding were identified.[8] The aim of this study is to assess the quality of ANC services in selected primary healthcare centers (PHCC).

## METHOD

This cross-sectional study was conducted in Federal Capital Territory (FCT) one of the six area councils in Abuja. The location (rural/urban) and the mode of operation (dispensaries, health facility, and comprehensive/revitalized health centers) of the Abuja Municipal Area Council were considered. Majority of the data was obtained from home visits between January and March (a total three months).[15]

The minimum sample size required for the study was estimated to be 386 using the formula $n=p(1-p)(Z/d)^2$, where nis the sample size, Z is the standard normal deviation set at 1.96 (for 95% confidence level), dis the desired degree of accuracy (taken as 0.05), and p is the estimate of the satisfaction rate among the target population of this study (which was assumed to be 50% in the absence of a pre-existing estimate).[16] The sample size of 386 pregnant women was met by selecting pregnant women attending ANC from each selected health facility. Four health facilities were used as primary sampling units that were selected using the simple random sampling technique.

The study population comprised of pregnant women attending antenatal clinics and service providers in the selected PHCC. An ANC exit interview questionnaire of the safe motherhood needs assessment package was adapted and used to obtain information on services received by the pregnant women. All responses were validated with their maternity cards.[10] Structured questionnaires were used to collect demographic data by interviewing ANC users. Data collectors were selected from the health facilities and given a one-day orientation on data collection.

This study assessed the ten nationally recommended and recognized components of ANC and the satisfaction of users. The outcome variable in this study is the quality of ANC services in FCT. The desirable (good) ANC quality is the competent service delivery of all the 10 components that are satisfying to users.[8,17] The ANC components are receiving of iron supplements, deworming drugs, at least two doses of tetanus toxoid injections, malaria intermittent preventive treatment in pregnancy (IPTp), and health education on danger signs and complications during pregnancy, blood pressure measurement, urine tests, blood tests, and health talk on prevention of mother-to-child transmission (PMTCT) of the human immunodeficiency virus (HIV)/AIDS and counseling, testing, and collecting of results of HIV/AIDS.[8] Net Promoter Score (NPS) was used to gauge the level of satisfaction for customers/clients. Moreover, the NPS can be defined as the percentage of promoters minus the percentage of detractors.[18-20] Patient satisfaction was defined as the highly desirable outcome of clinical care and may be an element of health status and quality of care.[16,17] The independent variables were sociodemographic characteristics of the respondents (age, marital status, education, religion, income status, ethnicity, number of visits, and gravidity), waiting time, consultation time, knowledge, and the skill and abilities of healthcare providers.[21,22] Income status was classified as low, middle and high-income. Low-income status pregnant women are respondents that earn below the monthly Nigerian basic minimum wage (less

than 100 dollars per month). Middle-income status pregnant women are respondents that earn above the monthly Nigerian basic minimum wage (between 100 to 500 dollars per month). High income status pregnant women are respondents that earn at least 500 dollars per month.

Pregnant women who were referred from the rural to urban areas and vice versa to eliminate recall bias were excluded.

The data were analyzed using Microsoft Excel and Statistical Package for the Social Sciences (SPSS) software. Frequency, percentage, mean, and standard deviation were used as descriptive statistical methods. Chi-square test was used to compared categorical variables. A p value <0.05 was considered statistically significant.

## RESULTS

A total of 386 pregnant women who applied ANC included in this study and the mean age was 29.0±3.0 years. Sociodemographic features of the pregnant women applied to ANC by region are summarized in Table 1.

A total of ten parameters such as iron supplementation, vaccination, deworming drugs, preventive treatment of malaria, blood pressure, urine test, blood test, danger signs,

**Table 1.** Sociodemographic features of the pregnant women applied to antenatal care by region

| | Primary Health Care Centers | | | | |
|---|---|---|---|---|---|
| | **Orozo (n=123)** | **Jikwoyi (n=64)** | **Kuchingoro (n=136)** | **Apo (n=63)** | **Total (n=386)** |
| Age groups | | | | | |
| 19 years and below | 4 (3.2) | 8 (12.5) | 22 (16.2) | 2 (3.2) | 36 (9.3) |
| 20-34 years | 113 (91.9) | 52 (81.3) | 108 (79.4) | 54 (85.7) | 327 (84.7) |
| Above 35 years | 6 (4.9) | 4 (6.2) | 6 (4.4) | 7 (11.1) | 23 (6.0) |
| Marital status | | | | | |
| Married | 119 (96.7) | 54 (84.4) | 130 (95.6) | 62 (98.4) | 365 (94.6) |
| Unmarried | 4 (3.3) | 10 (15.6) | 6 (4.4) | 1 (1.6) | 21 (5.4) |
| Duration of education | | | | | |
| 0-5 years | 28 (22.7) | 8 (12.5) | 14 (10.3) | 7 (11.1) | 57 (14.8) |
| 6-11 years | 12 (9.8) | 21 (32.8) | 16 (11.8) | 9 (14.3) | 58 (15.0) |
| 12-17 years | 60 (48.8) | 25 (39.1) | 82 (60.3) | 23 (36.5) | 190 (49.2) |
| 17 years and above | 23 (18.7) | 10 (15.6) | 24 (17.6) | 24 (38.1) | 81 (21.0) |
| Religion | | | | | |
| Christianity | 83 (67.5) | 50 (78.1) | 93 (68.4) | 47 (74.6) | 273 (70.7) |
| Others | 40 (32.5) | 14 (21.9) | 43 (31.6) | 16 (25.4) | 113 (29.3) |
| Ethnicity | | | | | |
| Yoruba | 34 (27.6) | 8 (12.7) | 9 (6.6) | 4 (6.3) | 55 (14.3) |
| Igbo | 48 (39.0) | 22 (34.9) | 37 (27.2) | 16 (25.4) | 124 (32.1) |
| Hausa | 34 (27.6) | 31 (49.2) | 41 (30.2) | 18 (28.6) | 124 (32.1) |
| Others | 7 (5.8) | 2 (3.2) | 49 (36.0) | 25 (39.7) | 83 (21.5) |
| Income status | | | | | |
| Low | 18 (14.6) | 25 (39.1) | 95 (69.9) | 29 (46.0) | 167 (43.3) |
| Middle | 105 (85.4) | 39 (60.9) | 41 (30.1) | 34 (54.0) | 219 (56.7) |
| High | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Number of visits | | | | | |
| 2 or less | 95 (77.2) | 31 (48.4) | 50 (36.8) | 52 (82.5) | 228 (59.1) |
| 3 and above | 28 (22.8) | 33 (51.6) | 86 (63.2) | 11 (17.5) | 158 (40.9) |
| Gravidity | | | | | |
| 2 or less | 63 (51.0) | 50 (78.5) | 120 (88.2) | 46 (73.0) | 279 (72.3) |
| 3 and above | 60 (49.0) | 14 (21.5) | 16 (11.8) | 17 (27.0) | 107 (27.7) |

Data is presented as n(%).

education PMTCT and HIV testing services were evaluated in the ANC. Frequency of ANC users that received all ten ANC components was 323 (83.7%). ANC components applied during the visit are summarized Table 2.

It was determined that 302 (78.2%) of the pregnant women waited up to 120 minutes and 31 (8.0%) waited more than 240 minutes before receiving service by an ANC provider. Features of the ANC service are summarized in Table 3.

While 303 (94.4%) of married pregnant were satisfied, 62 (95.4%) of them were unsatisfied (p=0.043). On the other hand, 227 (70.7%) of the Christian pregnant women were satisfied and 46 (70.8%) of them were unsatisfied (p=0.993). Sociodemographic features according to level of satisfaction are summarized in Table 4.

It was determined that 297 (76.9%) of the pregnant women were satisfied with the care they received during ANC, and 89 (23.1%) were not satisfied. Therefore, NPS = promoters – detractors = 76.9%–23.1% = 53.8%. Satisfaction status of pregnant women applying to ANC by region is summarized in Table 5.

**Table 2.** Antenatal care components applied during the visit

| | Availability | |
|---|---|---|
| | **Yes** | **No** |
| Iron supplementation | 332 (86.0) | 54 (14.0) |
| Tetanus-Diphtheria vaccination | 330 (85.5) | 56 (14.5) |
| Deworming drugs | 187 (48.4) | 199 (51.6) |
| Intermittent preventive treatment of malaria in pregnancy | 309 (80.1) | 77 (19.9) |
| Blood pressure | 352 (91.2) | 34 (8.8) |
| Urine test | 356 (92.2) | 30 (7.8) |
| Blood test | 359 (93.0) | 37 (7.0) |
| Danger signs | 326 (84.5) | 60 (15.5) |
| Education on PMTCT | 343 (88.9) | 43 (11.1) |
| HIV testing services | 336 (87.0) | 50 (13.0) |

PMTCT: Prevention of mother-to-child transmission.
Data is presented as n(%).

**Table 3.** Features of the antenatal care service

| | **n (%)** |
|---|---|
| Available personnel other than the ANC provider | |
| Yes | 190 (49.2) |
| No | 196 (50.8) |
| Number of personnel available other than the ANC provider | |
| Less than 2 | 203 (52.6) |
| More than 3 | 183 (47.4) |
| Waiting time before receiving care from the ANC provider | |
| 1 min – 120 mins | 302 (78.2) |
| 121 mins – 240 mins | 53 (13.8) |
| More than 240 mins | 31 (8.0) |
| Length of time spent with the ANC provider | |
| Less than 30 mins | 310 (80.3) |
| More than 30 mins | 76 (19.7) |

ANC: Antenatal care.

## DISCUSSION

This study found that 76.9% of PHCC ANC users in FCT received desirable quality ANC services with a NPS of 53.8% on the satisfaction of users. In addition, 16% of the attendees did not receive any of the ten ANC components considered in this study.

**Table 4.** Sociodemographic features according to level of satisfaction

| | **Satisfied (n=321)** | **Unsatisfied (n=65)** | **p** |
|---|---|---|---|
| Age groups | | | |
| 19 years and under | 29 (9.0) | 7 (10.8) | 0.243 |
| 20-34 years | 272 (84.7) | 55 (84.6) | |
| 35 years and older | 20 (6.3) | 3 (4.6) | |
| Duration of education | | | |
| 0-5 years | 36 (11.2) | 13 (20.0) | 0.065 |
| 6-11 years | 49 (15.3) | 12 (18.5) | |
| 12-17 years | 163 (50.8) | 31 (47.7) | |
| 17 years and above | 73 (22.7) | 9 (13.8) | |
| Ethnicity | | | |
| Yoruba | 44 (13.7) | 11 (16.9) | 0.044 |
| Igbo | 96 (29.9) | 28 (43.1) | |
| Hausa | 109 (34.0) | 15 (23.1) | |
| Others | 72 (22.4) | 11 (16.9) | |
| Income status | | | |
| Low | 149 (46.4) | 18 (27.7) | 0.019 |
| Middle | 172 (53.6) | 47 (72.3) | |
| Number of visits | | | |
| 2 or less | 181 (56.4) | 47 (72.3) | 0.043 |
| 3 and above | 140 (43.6) | 18 (27.7) | |
| Gravidity | | | |
| 2 or less | 232 (72.3) | 45 (69.2) | 0.499 |
| 3 and above | 89 (27.7) | 20 (30.8) | |

Data is presented as n(%).
Chi-square test.

**Table 5.** Satisfaction status of pregnant women applying to antenatal care by region

| | Primary Health Care Centers | | | | p |
|---|---|---|---|---|---|
| | Kuchigoro (n=136) | Apo (n=63) | Jikwoyi (n=64) | Orozo (n=123) | |
| Unsatisfied (n=89) | 22 (16.2) | 15 (23.8) | 11 (17.2) | 41 (33.3) | 0.019 |
| Satisfied (n=297) | 114 (83.8) | 48 (76.2) | 53 (82.8) | 82 (66.7) | |

Data is presented as n(%).
Chi-square test.

Results from this study on the proportion receiving the different components of ANC offered in FCT were similar to the proportions reported in Nepal and Nigeria.[8,23,24] The most common components of ANC offered in the study area were blood and urine testing because they were offered to nearly all the attendees. These findings were in variance with a previous study in Nigeria that found low blood and urine tests.[24] In addition, urine and blood analysis are important ANC components and should continuously be made available in FCT, considering the high level of health-related problems. The proportion of women receiving health education on PMTCT was 89%. However, 5% of the women that received health education were not tested for HIV. The proportion of women that received health talks on pregnancy danger signs and tetanus–diphtheria vaccination was above average. This seems to be an improvement from a similar study from Uganda but similar to a study in Nepal.[8,23] The proportion of pregnant women receiving deworming drugs was 48.4%. This study revealed that 19.9% of ANC users did not receive ITPp although the policies of WHO and the Nigerian government recommend the receipt of at least three doses of sulfadoxine–pyrimethamine during the second and third trimesters.[12] In addition, malaria remains both a clinical and public health challenge in Nigeria especially among expectant mothers and young children.[8,24]

This study found that secondary school educational attainment, middle-income status, and type of health facilities where ANC was sorted were the strongest determinants of the receipt of desirable ANC quality in FCT. This outcome is aligned with studies carried out in Nepal and Nigeria.[23,25] The findings of this study showed that pregnant women with high educational attainment and high income were less likely to attend ANC in PHCC but would rather seek care in secondary or tertiary health facilities. This agrees with the outcome of recent studies in Nigeria, Uganda, and Nepal.[8,23,26] An impressive result of this study is the low attendance of ANC in less educated women, because all ANC services in Nigeria are free. A similar study from Nepal, showed that this low attendance was due to the difficulty in obtaining transport to the health facilities as a major problem especially in rural areas.[23]

Besides transportation problems, scarcity of health facilities, waiting time, and scarcity of health providers in rural areas may have worsened the situation in rural FCT.[15] Furthermore, middle-income earners were more likely to attend ANC in PHCC than low-income earners similar to an established research, which showed that women of higher socioeconomic status may have a stronger economic capacity to afford and access better healthcare and information and hence would prefer a higher level of care.[23]

Revitalized PHCC have higher odds of rendering desirable ANC quality than other PHCC. This result agrees with the outcome of a study from Nepal.[24] However, the proportion of health workers providing adequate attention to users was low, which may have contributed to the reduced quality of care.

## CONCLUSION

The quality of ANC services in FCT is still substandard and is mostly influenced by women's residence, age at birth of the last child, educational attainment, socioeconomic status, the geographical zones they previously lived in, adequacy in the number of visits, the skill of the service provider, and the type of health facilities where ANC was received. On the other hand, compliance with WHO recommendations on use of deworming drugs and malarial control was poor. Poor ANC services negatively affect morbidity and mortality of pregnant women, newborns, and children. Therefore, clinicians, public health practitioners, and policy makers should evaluate the success and quality of ANC and its coverage and try to improve them.

### Disclosures

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

**Ethics Committee Approval:** Ethical approval for this study was sought and obtained from the Federal Capital Territory Health and Human Services Secretariat's Ethical Committee, Federal Capital Development Agency, Abuja (Approval date: Jan 24, 2018, and Approval number: FHREC/2018/01/11/05-02-18). Informed consent was obtained from all participants.

**Authorship Contributions:** Concept – V.A.; Design – V.A.; Supervision – M.Y.I.; Materials – V.A.; Data collection &/or processing – V.A.; Analysis and/or interpretation – V.A., M.Y.I., M.B.; Literature search – V.A.; Writing – V.A.; Critical review – M.B.

## REFERENCES

1. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. Lancet 2016;387(10017):462–74.
2. Community Medicine for Academics and Lay Learners. WHO updates fact sheet on Maternal Mortality (19 September 2019). Available at: https://communitymedicine4all.com/2019/20/who-updates-fact-sheet-on-maternal-mortality-19-september-2019. Accessed May 20, 2020.
3. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health 2014;2(6):e323–33.
4. United Nations Children's Fund. Level & Trend in Child and Maternal Mortality: 2019. Available at: https://www.unicef.org/reports/levels-and-trends-child-mortality-report-2019. Accessed Aug 20, 2020.
5. Olonade O, Olawande TI, Alabi OJ, Imhonopi D. Maternal mortality and maternal health care in Nigeria. Implications for socio-economic development. Open Access Maced J Med Sci 2019;7(5):849–55.
6. National Population Commission [Nigeria] and ICF International. Nigeria demographic and health survey 2013. Available at: https://dhsprogram.com/pubs/pdf/fr293/fr293.pdf. Accessed May 20, 2020.
7. Lincetto MS, Mothebesoane-anoh S, Gomez P. Antenatal care: opportunities for Africa's Newborns. 1st ed. New York: WHO; 2010. p. 45–6.
8. Fagbamigbe AF,Idemudia ES. Assessment of quality of antenatal care services in Nigeria: Evidence from a population-based survey. Reprod Health 2015;12(1):1–9.
9. Titaley CR, Dibley MJ, Roberts CL. Factors associated with underutilization of antenatal care services in Indonesia: Results of Indonesia Demographic and Health Survey 2002/2003 and 2007. BMC Public Health 2010;10:485.
10. Ajayi IO, Ikeoliuwapo DC. Socio demographic factors determining the adequacy of antenatal care among pregnant women visiting Ekiti state primary health centers. Online J Health Allied Sci 2013;12(2):1–6.
11. World Health Organization. Maternal mortality: Levels and trends 2000 to 2017. Available at: https://www.who.int/reproductivehealth/publications/maternalmortality-2000-2017/en/. Accessed Aug 20, 2020.
12. Salamon LJ, Alfirevic Z, Raine-Fenning NJ, Timor-Tritsch I, Seshadri S. ISUOG practice guidelines: performance of first-trimester fetal ultrasound scan. Ultrasound Obstet Gynecol 2013;41(1):102–13.
13. WHO. WHO recommendations on antenatal care for a positive pregnancy experience: Summary. WHO 2018;10:1–10.
14. WHO. Mortality database 2014. Available at: http://www.who.int/healthinfo/statistics/mortality/en/. Accessed May 20, 2019.
15. Nigerian Urban Reproductive Health Initiative. Toolkit Abuja 2009. Available at: URL: https://www.nurhitoolkit.org/program-cities/abuja#.YK-0dKhKjIU. Accessed May 20, 2019.
16. Dell RB, Holleran S, Ramakrishnan R. Sample size determination. ILAR J 2002;43(4):207-13. Erratum in: ILAR J 2003;44(3):239.
17. Torcson PJ. Patient Satisfaction : the Hospitalist 's Role. Available at: https://www.the-hospitalist.org/hospitalist/article/122984/patient-satisfaction-hospitalists-role. Accessed May 19, 2020.
18. Bain & Company, Satmetrix Systems. Net Promoter Score and System (NPS): an introduction. Available at: https://www.i-scoop.eu/customer-experience/net-promoter-score-nps/. Accessed Aug 20, 2019.
19. Pearson A. Net Promoter Scores Used to Address Patient Satisfaction. Available at:https://www.reliasmedia.com/articles/144304-net-promoter-scores-used-to-address-patient-satisfaction-quality. Accessed Aug 20, 2019.
20. Spark Char Pty Ltd. How to measure Customer Satisfaction with NPS, CSAT or CES. Available at: https://www.sparkchart.com/customer-satisfaction-nps-csat-ces/. Accessed May16, 2020.
21. Beltman JJ, Van den Akker T, Bwirire D, Korevaar A, Chidakwani R, van Lonkhuijzen L, et al. Local health workers' perceptions of substandard care in the management of obstetric hemorrhage in rural Malawi. BMC Pregnancy Childbirth 2013;13:39.
22. Kak N, Burkhalter B, Cooper M. Measuring the Competence of Healthcare Providers. Operations Research Issue Paper 2001;2(1):1–28.
23. Joshi C, Torvaldsen S, Hodgson R, Hayen A. Factors associated with the use and quality of antenatal care in Nepal: a population-based study using the demographic and health survey data. BMC Pregnancy Childbirth 2014;14:94.
24. Agha S, Tappis H. The timing of antenatal care initiation and the content of care in Sindh, Pakistan. BMC Pregnancy Childbirth 2016;16(1):190.
25. Fagbamigbe AF, Idemudia ES. Barriers to antenatal care use in Nigeria: Evidence from non-users and implications for maternal health programming. BMC Pregnancy Childbirth 2015;15:95.
26. Shambe IH, Pam VC, Enokela MA, Oyebode TA, Daru PH, Gyang MD, et al. Choice of place of antenatal care among women of reproductive age in a semiurban population in northcentral. Trop J Obstet Gynaecol 2018;35(1):54–7.