Original article

Perceptions of essential obstetric care by rural pregnant women and safe motherhood approaches: An interventional study


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ABSTRACT

Objectives: To assess the level of awareness about Antenatal and Postnatal care in rural women, to understand health seeking patterns of pregnant women, to relate socio-economic factors to the health seeking patterns, to provide awareness and interventions.

Methodology: A prospective interventional study was conducted over a period of 6 months among the patients of a government district hospital of Kerala; in three phases: pre interventional, interventional, and post interventional phase.

Results: Before providing intervention, 89.8% of mothers were aware that vaginal bleeding is one of the danger signs of pregnancy, which increased to 99.8% post intervention. Similarly, they also became aware that convulsions (99%), severe abdominal pain (96.8%) and persistent headache with visual disturbances (98.4%) were the danger signs of pregnancy. The knowledge about pregnancy induced hypertension (99.2%), gestational diabetes (99.6%), gestational anemia (98.8%) and gestational epilepsy (96.2%) had increased post intervention.

Initially, 55.2% of women were not aware of any of the diseases. After intervention it decreased to 0.2%. The knowledge on Bacille Calmette Guerin (BCG), Hepatitis B, Polio, Diphtheria Tetanus toxoids Pertussis (DTP) had a notable increase (98.4%, 97.6%, 98.2%, 91.6% respectively) after intervention. Also, 35.2% of the women did not know why any of these vaccines were given. After the intervention the value declined to 0.8%.

Conclusion: This study recognizes the need to focus on the factors associated with utilization of the available free safe motherhood services across all public health facilities. Community engagement and social awareness could play a very crucial role to help promote maternal health.

1. Introduction

Maternal death is defined by the World Health Organization (WHO) as the death of women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental cause. Globally, about 800 women die every day from curable causes related to pregnancy and childbirth. High prevalence of maternal deaths (99%) occur mostly in developing countries among rural areas and poor communities. In India, maternal deaths stand as high risk as 174 deaths per 100,000 live births and it is a major public health challenge.

Live birth refers to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life – e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles – whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.1

Food and Drug Administration (FDA) Classification: Drugs used in pregnancy are classified by FDA into five categories, categories A, B, C, D and X. Category A is considered the safest category and category X is completely contraindicated in pregnancy. This help as a therapeutic guide for clinicians.1

Pregnancy complications can threaten the life of mother and fetus.2 However, not all women regard pregnancy complications as an abnormal condition, owing to lack of knowledge about danger signs and symptoms.2 The danger signs of pregnancy are not the actual obstetric complications, but are symptoms that could be recognized by non-clinical personnel. Knowledge of pregnancy danger signs are

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paramount in improving maternal and fetal health outcomes. Knowledge of danger signs during Ante Natal Care (ANC), labor, and perinatal period is central for safe parenthood. Perception of obstetric danger signs is also the vital initial stage in being compliant and to accept appropriate and timely referral to obstetric care.

Breastfeeding and breast milk are the standard requirements for infant growth and development. Breast milk is recommended as a nutritional source during the first 6 months of infant stage and continued up to 2 years of age. Breastfeeding provides innate immunity for the newborns. It saves the lives and reduces the disease burden of both infants and mothers. Women who breastfeed require 500 additional kcal/day than those recommended in non-pregnant women. During pregnancy, period an additional 2–5 kg as fat in the tissues marked as the physiological preparation to maintain lactation. It is not uncommon for the lactating women to lose 0.5–1.0 kg/month after the postpartum month.

Neonates and infants suffer a higher frequency and severity of microbial infection resulting in millions of deaths worldwide. Newborns have an immature defense system that renders them at high risk for infection whereas at the same time reducing response to most vaccines. Birth is considered as the most reliable stage of healthcare contact worldwide and effective vaccination at birth would provide primary protection for newborns.

The health of women and child are still facing challenge all over the world. The timing of antenatal care visit made by the mother and the child is very optimal for the health of a woman and child. It is very important to make sure that the care they receive are crucial in today’s world. During each trimester, care and visit towards the hospital is very important to make sure that the child and mother are healthy.

2. Methodology

The study was carried out at the Government district Hospital Perinthalmanna, Malappuram district of Kerala. The hospital is equipped with various specialty departments and a wide range of diagnostic facilities. A prospective interventional study was conducted among the inpatients and outpatients of Obstetrics and Gynecology department of the District hospital of Perinthalmanna, Malappuram district, Kerala. The study was carried out for over a period of 6 months, from October 2019 to March 2020. This study was approved by the Ethical committee of the institution and an official consent was also given for performing the study. The inclusion and exclusion criteria were indicated in the protocol submitted to and approved by the IEC as per letter number KAS/IEC/PharmD/2019-02.

All willing pregnant women (age 18–35 years) were included in the study. Those women who had given birth in the past two years and were either visiting the OB/GYN or were admitted in the hospital for gynecology/obstetrics related concerns during the duration of study were also included. All pregnant and postnatal women who were not willing to participate in the study, those patients admitted in Intensive Care Unit, casualty and ventilator and those who left against clinical guidance were excluded. Supporting literatures were collected from authorized international and national journals. Carefully audited data obtained from literature review and scenario at the study site were put together in building a data collection form and a protocol. Questionnaire and leaflets were developed for the study.

The Questionnaires were prepared in two forms. A Pre-intervention Questionnaire and a Post-intervention Questionnaire. The Pre-intervention questionnaire was used to collect the; 1) Patient demographics, 2) previous delivery date, 3) previous checkup and Ultrasonography (USG) details, 4) supplements and other drugs used during pregnancy, 5) comorbidities, 6) Identification of danger signs, 7) awareness about the mentioned diseases and neonatal vaccines, and 8) previous pregnancy difficulties. A similar post-intervention questionnaire was used to enquire whether the knowledge of the participants have improved after the intervention.

Face validation of the questionnaires were done by an expert panel consisting of Head of department (HOD) of Obstetrics and gynecology, an obstetrician and HOD of department of Pharmacy practice. In this study, the questionnaire was piloted using a sample population of 50 women prior to initiation of study. The aim was to eliminate any vagueness in the questions. The returned questionnaires were fully and appropriately completed and, the response choices were adequate and understandable.

The targets were identified during ward round participations and outpatient visits in gynecology department. After collection of the complete data, the patient demographics, antenatal care patterns such as, regular checkups, USGs, drugs taken, and supplements used were. The degree of improvement in awareness after intervention was analyzed using a post-intervention questionnaire.

Pre-intervention phase: An observational audit was conducted for all patients who were eligible according to inclusion criteria. The full details of the cases including patient name, sex, age, educational qualification, patterns of antenatal care, and present knowledge regarding maternal danger signs and postnatal vaccines were brought in with the help of a self-designed and validated patient questionnaire. All the patients meeting the criteria were interviewed after ward-rounds or after their outpatient visits with the obstetrician.

Intervention phase: A single faceted intervention was targeted to reach all study participants. An educational intervention (leaflet) was prepared. The leaflet alerted about the importance of antenatal care, knowledge of relevant maternal disease, and awareness about the danger signs and postnatal vaccination. One-to-one counselling was also provided to the study participants.

Post-intervention phase: The post-intervention was conducted in the same manner as the pre-intervention audit using a modified data collection form. The data were analyzed to determine the degree of effectiveness of the interventions.

The phases were implemented consecutively; one after the other. The Intervention was provided shortly after the initial pre-intervention data collection. The post-intervention phase was also carried out soon after the intervention or within a day of intervention in some cases. The authors are of the opinion that if the duration between intervention and post intervention survey was longer, it could negatively impact the results, as the information would be less retained by the participants, if not aided by the leaflet.

All the data collected during the study period were statistically analyzed for formulating the result by using the statistical package for social science (SPSS) 25.0 for windows version. Mean and standard deviation of age were calculated. Frequency distribution of parameters like age, educational qualification, hospital visits, supplements, comorbidities and drugs were analyzed. The data obtained and the participant’s related parameters were computed using MS-Excel. The results were expressed as percentage or proportion either as a pictorial representation in the form of bar diagram and pie chart or in tabular form. For the categorical variables, frequencies and percentage were computed with the paired t-test. The significance of each result was inferred from the P value. Results were interpreted with P value, which is probability of accepting the null hypothesis. Significant level was set at <0.05.

3. Results

Out of 500 participants, the age was classified into five groups: below 20, 20–25, 25–30, 30–35, and above 35. Maximum number of pregnant women belongs to age group 20–25 years (n = 190, 38%) followed by 25–30 years (n = 120, 24%) (Fig. 1). Their educational qualification was also assessed which showed that majority of the study participants have acquired secondary education (n = 223, 44.6%), followed by higher secondary education (n = 173, 34.6%) (Fig. 2). According to the data, majority of the women have had a pre-natal care visit in the 3rd trimester (n = 486, 96.4%) followed by 1st trimester (n = 476, 95.2%).
The least visits are during the 2nd trimester (Fig. 3). Similar patterns were seen in USG’s performed, where greatest number of USG’s were received by mothers in their 3rd trimester (n = 477, 95.4%) followed by 1st trimester (n = 420, 84%). It can be noted that, 1.4% of the women have not undergone any USG’s (n = 7, 1.4%) (Fig. 4). On evaluating the drug use patterns, the data showed that majority of the women used Iron supplements (n = 369, 73.8%) followed by folic acid (n = 329, 65.8%) during pregnancy. Fig. 5(a) shows that 48.4% (n = 242) of women took vitamins during pregnancy period and around 8.4% (n = 42) of women did not take any of the supplements. Paracetamol was found to be one of the most used drugs (n = 117, 23.4%). Ondansetron and Ibuprofen are the second and third leading drugs used by the study participants (8.8% (n = 44) & 7.4% (n = 37)) (Fig. 5(b)). The drugs taken by the subjects were classified according to their US FDA pregnancy category. Category A drugs were taken by 73.8% (n = 369) of the total participants, followed by Category B (39.2%, n = 196), Category C (9.4%, n = 47) and Category C (1.8%, n = 9) (Fig. 6). Thyroid diseases are the most notable comorbidity during pregnancy period (n = 159, 31.8%) followed by diabetes (24%, n = 120) and hypertension (17.4%, n = 87). From Fig. 7, it is seen that 41.8% (n = 209) women do not suffer from any of these diseases. Fig. 8 shows that 86% (n = 430) of the women had a term delivery and 12% (n = 60) comes under pre-term category. Post-term birth constitutes the least percent category (2%, n = 10). From this study, it can be seen that 68% (n = 340) of women have had a vaginal delivery and the remaining 32% (n = 160) belong to the caesarian category (Fig. 9). Also, 25% (n = 375) of the woman experienced pregnancy difficulties and 75% (n = 125) did not have any difficulties (Fig. 10).

Based on the collected data, the result of intervention is tested using the paired t-test. Here we test the null hypothesis (H0) against the alternative hypothesis (H1). For the results, the P value is taken for the two-tailed form of the t-test. The significance of each result was inferred from the P value, which is the probability of accepting the null hypothesis. Significant level was set at <0.05. If the P value is less than the standard significance level of 0.05, the null hypothesis was rejected.
**H0.** Intervention is not effective

**H1.** Intervention is effective

Before providing intervention, only 89.8% (n = 449) of mothers knew that vaginal bleeding is one of the danger signs of pregnancy. After the intervention, it shows that 99.8% (n = 499) of women were aware that vaginal bleeding is a danger sign of pregnancy. Similarly, the women also became aware about convulsions (99%, n = 495), severe abdominal pain (96.8%, n = 484) and persistent headache with visual disturbances (98.4%, n = 492) being the danger signs of pregnancy. This variation was found to be statistically significant (i.e., P value is 0.0012). Hence, it can be said that the intervention is effective (reject the null hypothesis)(Fig. 11).

The knowledge about pregnancy induced hypertension (99.2%, n = 496), gestational diabetes (99.6%, n = 498), gestational anaemia (98.8%, n = 494) and gestational epilepsy (96.2%, n = 481) had increased post intervention. Before providing the intervention, 55.2% (n = 276) of women were not aware of any of the diseases. Whereas, after the intervention it had decreased to 0.2% (n = 1). This variation was found to be statistically significant (i.e., P value is 0.01782). Hence the intervention was effective (Fig. 12).

Before providing the intervention, 41.4% (n = 207) of women did not know about any of the vaccines. Only 33.8% (n = 169) of women knew about the BCG vaccine before the intervention. After providing the intervention, 98.4% (n = 492) of them were aware about the vaccine. Similarly, the knowledge on HEPATITIS B, POLIO, DTP, etc. had a notable increase (97.6% (n = 488), 98.2% (n = 491), 91.6% (n = 458) respectively). This variation was found to be statistically significant (P value is 0.00540) (Fig. 13). Also, 35.2% (n = 176) of the women did not know why any of these vaccines were given. After the intervention the value declined to 0.8% (n = 4). Similarly, the women have gained knowledge on the vaccines like BCG (98.8%, n = 494), HEPATITIS B (97.8%, n = 489), POLIO (99.2%, n = 496), etc. This variation was found to be stastically significant (i.e., P value is 0.0004592). Hence the intervention is effective (Fig. 14).
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4. Discussion

A Prospective interventional study on ‘the perception of essential obstetric care by pregnant rural women and safe motherhood approaches was conducted. The health seeking behavior among the antenatal and postnatal mothers; and its association with the socio-demographic characteristic of the participants were studied. The age criteria for the study were females with age 18 years and above who attended the antenatal checkup at the hospital. Majority of the pregnant women belonged to the age group of 20–25 years (n = 190, 38%) followed by 25–30 years (n = 120, 24%). The antenatal care results suggest that women with age group of 20–30 years were identified as the predisposing determinant for utilization of ANC services than of younger ages, which could be the possible reason for increased percentage of antenatal care visits and USGS in respective trimesters. However, the knowledge on various disease states, vaccination, danger signs was scarce in the pre intervention stage. Later the study was able to outline the increase in the knowledge level of mothers in the post intervention stage. These study results were parallel to the studies conducted by Neil Abdurashid et al. Educated women tend to have a greater awareness of the existence of ANC services and the advantages of using such services. Moreover, higher levels of education tend to positively affect health-seeking behaviors, and education may increase a woman’s control over her pregnancy. In addition, education may help to expose women to more health education messages and campaigns, enabling them to recognize danger signs and complications and take appropriate action which was accomplished via our clinical intervention in the form of patient information leaflets and oral education and counselling on obstetric care services.

During this study the antenatal care received was also tested by evaluating the number of prenatal cares received and USGS received. Most of the women had chosen the prenatal visits in the third trimester (n = 486, 96.4%) and in first trimester (n = 476, 95.2%). The least visit occurred during the second trimester (n = 438, 87.6%). The greater number of USGS was received in the 3rd trimester (n = 477, 95.4%) followed by 1st trimester (n = 420, 84%). It is noted that, 1.4% of women did not undergo any USGS (n = 7). This result was analogous to the study conducted by Ranjana Singh et al. One of the significant and effective ways of preventing maternal morbidity and mortality in developing countries is through the antenatal service available at health centers. Antenatal care has an impact in the promotion of health during pregnancy through counselling and educational activities as well as, the screening, identification and referral, if necessary, of women with risk factors and the monitoring of health throughout pregnancy in order to detect and deal with the problems if and when they occur. In this study we found out the percentage of women who went for antenatal care visits, their mode of delivery and their type of delivery under the coverage of the rural healthcare services of Perinthalmanna. We found that overall, 86% of women had term delivery (n = 430). About 12% (n = 60) of women had a pre-term delivery. The educational qualification of most of the mothers were quite above the illiteracy level and majority belonged had received secondary education (n = 223, 44.6%) followed by higher secondary education (n = 173, 34.6%); which could be the possible reason for increased percentage of antenatal care visits and USGS in respective trimesters. However, the knowledge on various disease states, vaccination, danger signs was scarce in the pre intervention stage. Later the study was able to outline the increase in the knowledge level of mothers in the post intervention stage. These study results were parallel to the studies conducted by Neil Abdurashid et al. Educated women tend to have a greater awareness of the existence of ANC services and the advantages of using such services. Moreover, higher levels of education tend to positively affect health-seeking behaviors, and education may increase a woman’s control over her pregnancy. In addition, education may help to expose women to more health education messages and campaigns, enabling them to recognize danger signs and complications and take appropriate action which was accomplished via our clinical intervention in the form of patient information leaflets and oral education and counselling on obstetric care services.

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delivery which can be due to some complications like low oxygen level for fetus, decreased level of placental fluid etc. Also, 2% (n = 10) of women came under the category of post-term delivery. The data obtained is similar to a study conducted by Hayelom Gebrekristos Mengesha et al. The keen perception of the obstetric difficulties during previous deliveries was also reviewed and we found that, the 25% of women had faced some difficulties during their previous deliveries. This result was analogous to the study conducted by Jean Paul and the team on the pregnancy-based difficulties. During this study we found that there are about 340 (68%) women who had undergone with vaginal delivery and 160 women (32%) under caesarian category. According to the study the mothers who made more ante natal care visits had undergone vaginal delivery without any kind of complications. This result was parallel to the study conducted by Sarwat Mumtaz about the maternal healthcare utilization. Rational drug use in pregnancy requires the balancing of benefits and potential risks associated with the use of the drug. The benefits of rational drug use during pregnancy are not only restricted to the recovery of maternal health but are also helpful in the development of the fetus. By appropriate treatment of conditions like diabetes mellitus and infectious diseases of genital organs, embryopathies, preterm births and abortions could be prevented. In our study, Supplements and vitamins were the most frequently used drugs in pregnancy, with 458(91.6%) of women out of 500 using them. This high rate of supplemental intake can be attributed to the schemes by the government in providing free antenatal care. Paracetamol, Ondansetron, and Ibuprofen were the most commonly used OTC drugs. Periconceptional folic-acid supplementation can prevent most neural-tube defects and other congenital abnormalities of the cardiovascular system, urinary tract and limb deficiencies. Folic acid and Iron were taken by 65.8% (n = 329) and 73.8% (n = 369) respectively by the study participants in our study. Another study shows parallel results corresponding to Folic acid and Iron intake (H. Joshi et al.). In our study, it was found that Cat A (91.6%), Cat B (39.2%), Cat C (9.4%) and Cat D (1.8%) of OTC drugs were utilized by the study participants. A similar trend in drug usage during pregnancy was seen in other parts of the country. An Observational cross-sectional study done in Pune; India showed similar drug use pattern by pregnant women (Nargis Ibrahim Kureshee et al.). This data demands an in-depth education of pregnant women over the dangers of several OTC drugs during pregnancy.
The main intention of the study was to test whether the intervention was effective in improving the knowledge and health seeking behavior among antenatal and postnatal women. These were appraised by checking knowledge on danger signs of pregnancy, disease states, when and why the vaccines were given and duration of breast feeding.

The study disclosed that before providing the intervention, around 89.8% of mothers thought that vaginal bleeding is one of the danger signs of pregnancy.
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signs of pregnancy. After the intervention, it increased to 99.8%. Similarly, the percentage of study participants aware about convulsions (99%), severe abdominal pain (96.8%) and persistent headache with visual disturbances (98.4%) also increased post intervention. This variation was found to be statistically significant. Hence, it can be said that the intervention is productive.

There was a drastic divergence between pre-intervention and post-intervention in the duration of breastfeeding. After the intervention, 72.6% of women opted for 2 years of breastfeeding. The inequality in the duration changes from 49.4% to 72.6%. That is, the intervention is successful.

The study outcomes are correspondent to the studies conducted by Fauziah Jummaat et al. (2018). Knowledge of pregnancy danger signs would empower women to identify signs and symptoms of obstetric complications early and facilitate decisions to seek appropriate care before the life of the woman or fetus is endangered (12). This study could be able to improve the importance of antenatal and the knowledge of disease states, danger signs, and about postnatal vaccinations of pregnant women in rural population. This was achieved through leaflets and one to one counselling provided to the study participants during the interventional phase of the study. Several factors contributed to the strength of the study. The study had utilized self-administered questionnaire to avoid the socially derived bias. Also, the study emphasized the importance of clinical pharmacist service through clinical interventions such as patient information leaflets and one to one oral counselling. Few aspects put a constraint on the betterment of the study. Such as, the study recorded the list of non-prescription drugs taken but we were not able to make a query on prescription drugs taken by the pregnant women. Likewise, there was limited access to the OP patients for one-to-one counselling. This study could be recommenced for the next 12 months and extended to all the pregnant women in the tribal areas as well as urban areas in order to make a comparison in the availability and utilization of obstetric health services and to provide our clinical services for the empowerment of safe motherhood approaches.

5. Conclusion

Antenatal care is an essential component of safe motherhood approach. The study revealed that the overall utilization of antenatal health services was good as almost two third of the study participants had utilized it, while more than one third of them had poor utilization of antenatal care services. The study also recognized that the educational status of the mothers and their age plays a significant role in the underutilization of ANC services among the women from rural areas. The study identified the need to hence look at the significant factors associated with utilization of the available free ‘safe motherhood services’ across all public health facilities. Community engagement and social awareness could play a very crucial role to help promote maternal health thereby impacting the overall maternal health of the women in the future. The study outlined the increased percentage of USGS received during each trimester and effective consumption of pregnancy supplements. The intake of over-the-counter prescription drugs were listed with their category and the safety of the drugs taken by each subject were evaluated. Patient knowledge on the comorbidities, pregnancy danger signs and health seeking behavior were evaluated via a questionnaire. The results suggested the lack of awareness on importance of obstetric care due to poor education and economic status.

This study could allow to ameliorate the importance of antenatal care and the knowledge of disease states, danger signs, and postnatal vaccinations of pregnant women in rural population which could be achieved through leaflets and one to one counselling provided to the study participants during the interventional phase of the study. This study has divulged that knowledge on danger signs of pregnancy among antenatal women in rural population is poor. Therefore, there is a need to intensify efforts to provide health education on danger signs during pregnancy among antenatal women. Recognition of danger signs for pregnancy-related complications and what to do if they arise would significantly empower antenatal women to take appropriate steps to ensure a safe birth and to seek timely care in emergencies. The study proclaimed the prerequisite and the schedule of immunization. The need for prioritizing accessibility and awareness raising activities is evident from the study. Maternal morbidity and mortality are still a paramount health challenge. Lack of knowledge on teratogenic drugs and pregnancy complications is the leading cause for maternal death among rural areas.

Early recognition and accurate supervision of patients regarding drug use, strict fluid balance, optimum time of delivery and proper medication use, and lifestyle modifications would control the consequences of the pregnancy.

Declaration of competing interest

The authors declare no conflict of interest.

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