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Pregnancy Outcomes of Women in Lagos State: Is Nutrition Education Responsible?

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Abstract: This study determined the impact of hospital-based nutrition education on pregnancy outcomes of women in Lagos state. The cross-sectional study was conducted among 100 pregnant women (18-45 years) selected from two general hospital s in Lagos state. The subjects were randomly assigned to either Intervention (I) or Control (C) group in both urban and rural areas. Descriptive and inferential statistics were used for analysis. The results revealed that only 46% of pregnant women registered for ante-natal care in the first trimester. There was also improvement in the nutritional knowledge test score obtained at the fifth visit. Only 6% of the women who received nutrition education had stillbirths. 24% of the babies of the control group had low birth weights (<2.5kg) while 12% of those who received nutrition education had high birth weights (>4.0kg), the number (64%) of babies with normal weight was significantly ($p<0.05$) related to the time of maternal registration at the ante-natal clinic. There was a significant difference ($p<001$) between the birth weights of children in the control group and the intervention group. There was also a significant difference ($p>002$) between the nutrition knowledge test score of the respondents in the control and the intervention group. Frequent Continuing Education should be given to women of child bearing-age to increase more positive pregnancy outcomes.

Key words: Pregnancy outcomes, nutrition education, lagos state, Nigeria

INTRODUCTION

Pregnancy is part of a woman's life cycle and is one of the most nutritionally demanding times in a woman's life. Although it is a normal physiological process, it is a time when the nutritional needs of the mother and the foetus must be met through careful choice of foods (Strauss and Dietz, 1999). Successful pregnancy requires continuous adjustments in the maternal body composition, metabolism and the functions of various physiological systems. Maternal nutrition during pregnancy has a vital influence on the long term health prospects of the foetus. Nutrition during the preconception period, as well as throughout a pregnancy, has a major impact on pregnancy outcomes (King, 2003).

Pregnancy outcomes rank among the pressing reproductive health problems in the world. Globally, an annual estimate of 600,000 women aged 15-49 die of pregnancy related causes, with 99 percent coming from the developing world (Population Reference Bureau, 2002; WHO, 2000; Addai, 1998) and Nigeria alone accounting for 10% of this total (Okolocha *et al*., 1998). The status of maternal and foetal mortality in Nigeria may be threatening and calls for serious attention. Nigeria's antenatal clinics focus on check-ups and laboratory investigations whereas nutrition education, a key component of ante-natal care still remains a neglected area. Nigeria still has an extremely high maternal mortality rate with a ratio of 704 per 100,000 live births implying that with about 24 million live births annually, an alarming record of 170,000 Nigerian women die as a result of complications associated with pregnancy and childbirth. The maternal mortality ratio is about a hundred times worse than that in industrialized countries highlighting the widest disparities in international public health (UNICEF, 2011).

The cause of poor pregnancy outcomes and maternal complications among women with early pregnancies or short intervals between pregnancies has been debated. Some attribute the increased risk of poor pregnancy outcomes to various factors associated with being young or having short intervals (i.e., socioeconomic status, lifestyle, stress, adequacy of prenatal care, etc.). Others attribute the poor outcomes to an independent factor related to some aspects of the woman's physiology, such as biological immaturity, competition for nutrients or incomplete recovery of the physiological and anatomical adaptations in the reproductive system so that the woman is not biologically prepared for conception (Zhu *et al*., 1999). Accumulating evidence from studies done in both groups suggests that these poor pregnancy outcomes are not explained by socio-demographic or behavioral risk factors (Zhu *et al*., 2001; Story and Alton, 1995). However, a healthy diet

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contributes to a successful pregnancy outcome by reducing complications and promoting adequate fetal growth and development. Fuentes-Afflick and Hessol (2000).

Effective nutrition education in pregnancy enables pregnant women to adopt adequate dietary patterns and live healthy lifestyle even before the arrival of the unborn child. Pregnant women often need nutrition advice to ensure that they get adequate diet without overeating and as well as eating a nutritionally-adequate diet. Nutrition education is needed for the pregnant women to know what and when not to eat at a particular stage of their pregnancy. Nutrition Education is one of the prerequisites for improving the nutritional status of pregnant women. It enables the expectant mothers to adopt adequate dietary patterns and live healthy lifestyles even before the arrival of the unborn child. According to Paramjit, Ravnit and Sachdeva (2004), an ideal opportunity for nutrition education can be represented by the prenatal parents since at that time more than any other period, she may be highly motivated to understand and accept advice. Thus, adequate nutrition education contributes greatly in reducing complications in pregnancies.

Therefore, the study was conducted to determine the impact of hospital-based nutrition education on the pregnancy outcomes of women in Lagos State.

MATERIALS AND METHODS

Study sites and participants: Two General Hospitals (representing Urban and Rural areas in Lagos state) were selected for this study, The participants were selected from healthy women attending ante-natal clinics at the hospitals, Information on study procedures were provided for eligible pregnant women, Each woman signed a consent form confirming her willingness to participate, From each hospital, fifty participants were selected for the study, making a total of hundred participants. Ethical approval was obtained from the State Hospital Management Board.

Intervention study design: This cross-sectional intervention study was designed to evaluate the effectiveness of nutrition education intervention with the main focus on dietary quality and healthy behaviour during pregnancy. Participating women were randomly assigned to either intervention or control group in both urban and rural areas. Women of the intervention groups in both areas were informed to take part in two-hour nutrition education sessions. The sessions were held twice a month to ensure that every participant in the intervention groups could take part. The health educators were members of staff from the local maternal and child hospital, who were intensively trained by our research team. The content of the two sessions focused on:

a) Food group knowledge
b) Nutrient-food association knowledge
c) The importance of dairy consumption, fruit and vegetable consumption
d) Examples of healthy menus
e) Optimal hygiene behaviour and physical exercise patterns during pregnancy
f) Discussions about healthy lifestyle during post-partum period

Participants in the control groups did not receive the intervention but were exposed to the normal standard of ante-natal care.

Data collection: A semi-structured questionnaire was administered to the participants. The questionnaire included information on socio-demographic characteristics of the households, age, ethnic group, occupation and date of first ante-natal visit to the hospital. The nutrition and health knowledge test was performed for all the participants at the same time. The questionnaire included information on their health behaviour, physical activities and pregnancy outcomes. The health personnel assisted in completing the pregnancy outcome section.

The questionnaires including the nutrition and health knowledge test were designed by the research team. Before the formal investigation, the questionnaires were pre-tested and revised repeatedly according to the objectives of the study.

Data analysis: Descriptive and inferential statistics were generated using Statistical package for the socio-science software (SPSS) Version 16.0.

RESULTS

The results in Table 1 showed that one third of the pregnant women was aged between 18-24 years and about half of them were aged 25-34 years. Only 4% of the intervention group was above 45 years old. Based on ethnic group, more than half were Yorubas (57%) and another one-third Ibos. The Hausas were only 10% of the participants. The occupation of the pregnant women showed about half of them was both housewives and Civil servants, while, one-third were involved in trading/business.

Results showed that over 70% of the intervention group was registered for ante-natal within the first trimester of pregnancy and 46% of the control did at the second trimester. Overall 46% of the participants registered for ante-natal in the first trimester (Table 2).

The nutrition and health knowledge test as indicated on Table 3 was performed for all the participants at the time of the recruitment. The understanding rate of the nutrition and health knowledge was very low among all the participants. The post-test was performed at the fifth visit

Table 1: Socio-demographic characteristics

Variable	Control N (%)	Intervention N (%)	Overall N (%)
Age (years)			
18-24	13 (26.0)	18 (36.0)	31 (31.0)
25-34	27 (54.0)	25 (50.0)	52 (52.0)
35-44	10 (20.0)	5 (10.0)	15 (15.0)
>45	-	2 (4.0)	2 (2.0)
Ethnic group			
Yoruba	26 (52.0)	31 (62.0)	57 (57.0)
Igbo	18 (36.0)	15 (30.0)	33 (33.0)
Hausa	6 (12.0)	4 (8.0)	10 (10.0)
Occupation			
Trading	18 (18.0)	15 (30.0)	33 (33.0)
Housewife	15 (15.0)	11 (22.0)	26 (26.0)
Civil servant	8 (16.0)	16 (32.0)	24 (24.0)
Farming	9 (18.0)	-	9 (9.0)
Others	-	8 (16.0)	8 (8.0)

Table 2: Registration for ante-natal clinics

Variable	Control N (%)	Intervention N (%)	Overall N (%)
First trimester	10 (20.0)	36 (72.0)	46 (46.0)
Second trimester	23 (46.0)	9 (18.0)	32 (32.0)
Third trimester	17 (34.0)	5 (10.0)	22 (22.0)

Table 3: Nutrition knowledge score

Variable	Control N (%)	Intervention N (%)	Overall N (%)
First Visit (Pre-test)			
Low (0-39 marks)	7 (14.0)	5 (10.0)	12 (12.0)
Fair (40-59 marks)	23 (46.0)	24 (48.0)	47 (47.0)
Good (60-79 marks)	18 (36.0)	19 (38.0)	37 (37.0)
Excellent (80-100 marks)	2 (4.0)	2 (4.0)	4 (4.0)
Fifth visit (post-test)			
Low (0-39 marks)	5 (10.0)	-	5 (5.0)
Fair (40-59 marks)	17 (34.0)	8 (16.0)	25 (25.0)
Good (60-79 marks)	24 (48.0)	30 (60.0)	54 (54.0)
Excellent (80-100 marks)	4 (8.0)	12 (24.0)	16 (16.0)

Table 4: Pregnancy outcomes

Parameter	Control N (%)	Intervention N (%)	Overall N (%)
Normal delivery			
Live birth	30 (60.0)	42 (84.0)	72 (72.0)
Still birth	7 (14.0)	2 (4.0)	9 (9.0)
Cesarian section			
Live birth	9 (18.0)	5 (10.0)	14 (14.0)
Still birth	4 (8.0)	1 (2.0)	5 (5.0)
Birth weight			
<2.5 kg	12 (24.0)	4 (8.0)	16(16.0)
2.5-3.9 kg	27 (54.0)	37 (74.0)	64 (64.0)*
>4.0 kg	-	6 (12.0)	6 (6.0)
No record (still birth)	11 (22.0)	3 (6.0)	14 (14.0)

*Indicates p-value of <0.05 from X^2 test between intervention and control groups

for all of them. Women in the intervention groups exhibited significantly great improvement in overall nutrition and health knowledge after the education sessions. In both areas, significantly more women in intervention groups responded correctly to the questions than those in the control groups. Overall, 70% of the women scored from 60-100 marks at the post-test assessment.

The result also showed that 84% of the intervention group had live births through normal delivery, compared to 60% of the control group. Only 6% of the intervention group, who were given nutrition education had still birth (Normal delivery and Caesarian section), unlike 22% of those from the control group. This implies a high infant mortality rate. The birth weight of the babies showed that 74% of the women in the intervention group delivered babies who weighed 2.5-3.9 kg while 12% had babies who were above 4.0 kg. Twenty-four percent (24%) of those in the control group delivered babies of less than 2.5 kg (i.e., Low Birth Weight).

DISCUSSION

The results of this study showed supportive evidence of the contribution and impact of nutrition education on pregnancy outcomes. The findings from the intervention group showed that they performed better than their counterparts from the control group in the nutrition and health post-test assessment. This suggests improvement in their health behaviour throughout the pregnancy period. This implies that the hospital-based nutrition education lack adequate information on nutrient intake and health practices. This finding is in agreement with Girard and Olude (2013) who observed that health workers often lack adequate information to counsel pregnant and lactating women on how to meet increased nutrient requirements through dietary and behavioural changes and other health practices, they are also uncertain on how to translate general requirements into individual recommendations. This emphasizes the need for appropriate nutrition education intervention in ante-natal clinics.

More (94%) women in the intervention group had live births compared to those in the control group. There was a high (22%) rate of still birth (negative outcome) among the control group while only 6% was observed in the intervention group. A similar finding was reported by Liu *et al.* (2009). Fuentes and Hessol (2000) reported that a healthy diet contributes to a successful pregnancy outcome by reducing complications and promoting adequate foetal growth and development. King (2003) also stated that maternal nutrition in pregnancy has a vital influence on the long-term health prospect of the foetus and that nutrition during the pre-conception period, as well as throughout a pregnancy has a major impact on pregnancy outcomes.

The dietary intake of the intervention group could have contributed to the birth weights of the babies. Huma, (2013) observed that individuals who have knowledge on the importance of adequate and balanced diet are considered to reflect the knowledge on their health behaviours. Paramjt, Ravnit and Sacheva (2004) posited that adequate nutrient intake in pregnancy is needed to promote maternal and foetal tissue growth for optimum pregnancy outcome and that inadequate dietary intake may result in poor pregnancy outcomes. Nutritional education intervention during the early stages of pregnancy could reduce the risk of anaemia, gestational weight gain and improve birth weight. Webb and Olude (2013).

Over 70% of the women in the intervention group had babies with normal weight, ranging from 2.5-3.9 kg, while 12% had babies who weighed more than 4.0 kg at birth. This trend in birth weight was similar to the findings of Hermann *et al.* (2001) among pregnant Native Americans and Caucasian adolescents. Viteri (2004) also stated that women who had better knowledge of nutrition exhibit better dietary behaviour thus emphasizing the importance of adequate nutrition education for improving dietary behaviours and pregnancy outcomes.

Conclusions: Based on the results of the findings, the following conclusions were made:

i) The nutrition knowledge of the respondents in the control group was lower than the nutrition knowledge of those in the intervention group.
ii) The pregnant women in the intervention group had a higher percentage of successful pregnancy outcomes.
iii) There was a significant difference ($p<001$) between the pregnancy outcomes of the control and intervention groups.
iv) There was a significant difference ($p<002$) in the nutrition knowledge test score of the control group and the intervention group.

Recommendations: Experts in the field of Nutrition and Dietetics should be employed to teach nutrition education at ante-natal clinics.

Nutrition lectures at ante-natal clinics should be followed by practical demonstrations showing appropriate cooking methods Pregnant women should be encouraged to register early (IST trimester) at the ante-natal clinics.

Frequent continuing education should be planned for women of child-bearing age.

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