International Journal of Community Medicine and Public Health
Olukemitan TO et al. Int J Community Med Public Health. 2024 Aug;11(8):3023-3031
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20242161

Original Research Article

Knowledge and practice of essential nutrition actions among pregnant women in Ibadan, South-western Nigeria

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Received: 17 June 2024
Accepted: 21 July 2024

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ABSTRACT

Background: Maternal nutrition during the first 1,000 days has important influences on children's nutrition and pregnancy outcomes. This study therefore assessed the knowledge, attitude and practice of essential nutrition actions among pregnant women utilizing antenatal care services in Ibadan municipality, South-western Nigeria.
Methods: A descriptive cross-sectional study was conducted among pregnant women (15-49 years) receiving antenatal care (ANC) services across selected private and public health facilities. A semi-structured questionnaire was used to collect data on optimal dietary intake, prevention and control of anaemia and promotion of supportive lifestyle and care, according to the essential nutrition actions framework.
Results: The mean age of respondents was 29.85±4.89 years while the mean gestational age of pregnancy at respondents' ANC booking was 18.33±6.12 weeks. About one-third (33.60%) of the respondents had poor knowledge scores (mean knowledge score 5.70±1.50 out of 10), with no significant difference across type of health facility. Mean attitude score was 13.76±2.44 out of 20, while practice was generally poor (mean practice score 4.80±1.34 out of 10). Respondents attending larger tertiary hospitals for ANC had higher knowledge and practice compared to those who attended smaller primary health care centers/mission homes. Additionally, the time of booking, parity, and type of antenatal care center were statistically significant to knowledge and practice ($p<0.05$).
Conclusions: Antenatal care is still a valid platform for delivering maternal knowledge and encouraging practice of essential nutritional actions. It is recommended that expertise in tertiary hospitals be diffused to lower cadre of health care facilities to further strengthen ANC service delivery.

Keywords: Maternal nutrition, Knowledge, Attitude, Practice, Antenatal care

INTRODUCTION

Maternal nutrition and lifestyle choices are major influences on mother and child health.[1] Women's malnutrition (of any kind) in pregnancy does not only affect their health but also has the potential to harm the health of their offspring.[1,2] Good maternal nutrition during pregnancy involves the consumption of a variety of foods that enable a woman to meet the nutritional requirements for herself and the unborn baby.[3-5] Different forms of nutritional deficiency are currently responsible for substantial maternal and child morbidity and mortality worldwide.[1,2,6-8] Insufficient nutrition knowledge is stated as an underlying cause of child undernutrition which has severe consequences on growth and developmental capacity as the child grows into adulthood.[9] Poor knowledge and attitude to adopt necessary nutrition information in the course of pregnancy is not uncommon and poor practice of nutrition action is still an unclosed gap in pregnant women.[9-12] These factors have been proven necessary to maintain optimal nutrition and health during pregnancy.[13,14]

Essential nutrition actions (ENA) constitute a strategy to widen the coverage of seven affordable and evidence-based nutrition actions to improve the nutritional status of

women and children.[9,15] It is an operational framework for managing the advocacy, planning and the delivery of an integrated package of preventive nutritional actions encompassing infant and young child feeding (IYCF), micronutrients and the nutrition of women. According to WHO, the poor practice of essential nutrition actions contributes to about one-fourth of nutrition-related morbidity and mortality rates.[16,17] Sadly, more than half of the world's children do not have access to these lifesaving actions.[17] Sub-optimal IYCF practices alone increase the risk of infant and child morbidity and mortality by up to five-fold while maternal under-nutrition is estimated to account for about one-fifth of childhood stunting.[18] Therefore, pregnant women are expected to have the necessary knowledge and attitude to maintain optimal nutrition and health during pregnancy.[13,14]

In recent times, there are numerous studies that have assessed the knowledge and practice of maternal actions that protect or improve nutritional status of the mother or the child. However, fewer studies have evaluated the knowledge and practice of ENAs as described in its framework and much fewer studies have evaluated similar topics in Sub-Saharan Africa especially Nigeria. This study was therefore carried out to assess the knowledge, attitude and practice of maternal essential nutrition actions among pregnant women in Ibadan, South-western Nigeria.

METHODS

Study design

This study was a descriptive cross-sectional design.

Study population

The study was carried out among pregnant women receiving antenatal care (ANC) in selected government owned health facilities (primary health care centres (PHC), secondary health facilities (SHF), tertiary health facilities (THF) and selected nongovernmental health facilities including private maternity hospitals (PH) and mission homes (MH) within Ibadan municipality of Oyo State, South-western Nigeria.

Study area

Oyo State is one of the 36 states in Nigeria with Ibadan as the capital city and located in the south-west of Nigeria. Ibadan with an estimated population of about four million is the third largest city in Nigeria, after Lagos and Kano. It consists of 11 local governments areas (LGAs).

Sampling procedure

A multi-stage sampling technique was adopted for the selection of respondents for this study.

First, the purposive selection of Oyo State, Nigeria, second, the list of government and non-government health facilities was obtained from the department of Planning, Research and Statistics, Oyo State ministry of health. Thirdly, random selection of health facilities from the different tiers-tertiary, secondary, primary and non-governmental. Lastly, a total of 247 pregnant women who met the inclusion criteria were randomly selected across the health facilities. The inclusion criteria were consenting pregnant women in their second and third trimester of pregnancy and who have made more than one ANC visits during their index pregnancy.

Data collection procedures

The data collection instrument for this study consisted of five sections including three domains of essential nutrition actions: optimal dietary intake, prevention and control of anaemia and supportive lifestyle and care. The Knowledge, attitude and practice (KAP) instruments were adapted from Food Agriculture Organization and previous literature and pre-tested to ensure validity.[19-21]

For the knowledge questions, correct answers were assigned 10 points while incorrect answers were assigned zero point. To derive a subscale knowledge score for each of these three domains, mean score was obtained for each respondent.

The attitude score was derived from Likert scale responses for hypothetical scenarios on the domains of ENA services at ANC contact point. Twenty (20) points was assigned to agreement with positive (health promoting) statements, 10 points if undecided and zero point if respondents disagree with positive statement. This scoring was reversed for negative (health demoting) statements. Practice of pregnant women was assessed on two (optimal dietary intake and prevention and control of anaemia) of the three domains of ENA component in ANC. Practice of the third domain (supportive lifestyle and care) could not be fully assessed as majority of its contents including early breastfeeding initiation, exclusive breastfeeding and use of lactation amenorrhea as a family planning method which could not be adequately assessed since the women had not delivered. Optimal dietary intake practice of respondents was assessed using a 24-hour dietary diversity questionnaire containing nine food groups. Ten (10) points was assigned to any food groups consumed by respondent in 24 hours preceding field visit while zero points was assigned to any of the nine food groups that was not consumed.

On the other hand, prevention and control of anaemia practice of respondents was assessed using practice questions containing 4 standardized items related to prevention and control of anaemia during pregnancy. Ten points was assigned to practice that is of supportive of prevention and control of anaemia in pregnancy while zero point was assigned to practices that is not supportive of prevention and control of anaemia in pregnancy. The questionnaires for this study were administered by trained research assistants.

Ethical considerations

Ethical clearance was obtained from University of Ibadan/University College Hospital ethical review committee. The purpose of the study was explained to the prospective participants before any involvement. Only pregnant women who gave their written consent participated in the study and confidentiality of each participant was maintained.

Data processing and analysis

Data analysis was done using IBM statistical package for the social sciences (SPSS) version 20 after exporting the data from questionnaires. Descriptive statistics such as mean, standard deviation and frequencies was performed. Inferential statistical tests were performed to determine significant associations of the pregnant women's KAP of essential nutrition action.

RESULTS

A total of 247 pregnant females participated in this study. The mean age of respondents was 29.85±4.89 years and majority (59.1%) were between 26-33 years' age group. More than half (60.6%) attended their antenatal clinic at a government owned facility. Results further showed that 61.9% had up to tertiary level of education (Table 1). More than half (60.3%) of the mothers were multigravida and 77.7% were in their third trimester with over 50% having had 4 visits to antenatal clinics. The highest proportion (90.2%) of respondents reported that they get nutrition information from antenatal clinics, followed by friend or relatives and various media channels like television, radio, internet and books (Table 2).

When the scores of essential actions domains were compared, the mean knowledge score of the respondents was least for prevention and control of anaemia and highest for supportive lifestyle and care (Table 3). The mean attitude score of the respondents was least for optimal dietary intake and highest for supportive lifestyle and care. The mean practice score of the respondents was higher for optimal dietary intake compared to prevention and control of anaemia. A composite score for all respondents was derived from all mean scores per domain of maternal nutrition action. As shown in table 3, their mean composite knowledge score was 5.70±1.50 while about one of every three of the pregnant women had poor composite knowledge score. The mean composite attitude score was 13.76±2.44, while only 22.3% of the pregnant women had poor composite attitude score. For the composite practice score, the mean was 4.80±1.34, while half (50.0%) of the respondent had poor practice (Table 3).

The proportion of respondents who had good composite knowledge score seemed to increase with increasing respondents' educational level (Table 4). The results show that attitude score of respondents increased with age.

Table 1: Socio demographic characteristics of respondents.

Variables	Frequency	Percentage
Age group (in years)		
18-25	47	19.0
26-33	146	59.1
34-41	54	21.9
Health facility type		
Primary health care (PHC)	50	20.2
Secondary health facility (SHF)	50	20.2
Tertiary health facility (THF)	50	20.2
Private maternity hospital (PH)	47	19.0
Mission homes (MH)	50	20.2
Respondents' level of education		
No formal education	3	1.2
Primary	16	6.5
Secondary	75	30.4
Tertiary	153	61.9
Marriage type		
Monogamy	225	91.1
Polygamy	21	8.5
Religion		
Christianity	168	68.0
Islam	79	32.0
Parity status		
Primigravida	98	39.7
Multigravida	149	60.3
Gestational age at field visit		
2nd trimester	55	22.3
3rd trimester	192	77.7
Number of antenatal visit (times)		
<4 times	113	45.7
>4 times	134	54.3

Table 2: Respondents' source of nutrition information.

Variables	Yes (%)	No (%)
Sources of nutrition information antenatal clinic	221 (90.2)	24 (9.8)
Friend or relatives	79 (32.2)	166 (67.8)
Television	54 (22.1)	190 (77.9)
Radio	40 (16.3)	205 (83.7)
Internet	31 (12.7)	214 (87.3)
Books	24 (9.8)	221 (90.2)
Newspaper	15 (6.1)	230 (93.9)
Religious leaders or seminar	15 (6.1)	230 (93.9)
Community outreach by health workers	20 (8.2)	225 (91.8)
Health training	8 (3.3)	237 (96.7)

Table 3: Composite mean distribution of respondent's knowledge attitude and practice score by domain of maternal nutrition action.

Maternal nutrition domain	Knowledge			Attitude			Practice		
	Mean±SD	Min	Max	Mean±SD	Min	Max	Mean±SD	Min	Max
Optimal dietary intake	5.66±2.37	0.00	10.00	12.37±4.33	0.00	20.00	5.07±1.15	2.22	8.89
Prevention and control of anaemia	5.34±2.07	0.00	10.00	13.86±4.22	2.50	20.00	4.52±2.32	0.00	10.00
Supportive lifestyle and care	6.05±2.01	1.00	10.00	15.08±3.08	7.14	20.00	-	-	-
Composite mean score of respondent	5.70±1.50	1.98	9.67	13.76±2.44	6.43	20.00	4.80±1.34	1.11	7.78

Table 4: Association between socio demographic information and maternal knowledge, attitude and practice.

Variables	Knowledge					Attitude					Practice				
	Poor N (%)	Good N (%)	Total N (%)	X	P value	Poor N (%)	Good N (%)	Total N (%)	X	P value	Poor N (%)	Good N (%)	Total (N) %	X	P value
Age group (years)															
18-25	20 (42.6)	27 (57.4)	47	3.912	0.141	19 (41.3)	27 (58.7)	46	11.435	0.003*	27 (58.7)	19 (41.3)	46	1.927	0.382
26-33	50 (34.2)	96 (65.8)	146			26 (18.1)	118 (81.9	144			69 (48.9)	72 (51.1)	141		
34-41	13 (24.1)	41 (75.9)	52			10 (18.5)	44 (81.5)	54			24 (45.3)	29 (54.7)	53		
Respondent's education															
No formal education	2 (66.7)	1 (33.3)	3	7.565	0.056	1 (33.3)	2 (66.7)	3	14.652	0.002*	2 (66.7)	1 (33.3)	3	0.394	0.941
Primary	7 (43.8)	9 (56.2)	16			7 (43.8)	9 (56.2)	16			8 (50.0)	8 (50.0)	16		
Secondary	32 (42.7)	43 (57.3)	75			25 (33.3)	50 (66.7)	75			36 (48.6)	38 (51.4)	74		
Tertiary	42 (27.5)	111 (72.5)	153			22 (14.7)	128 (85.3)	150			74 (50.3)	73 (49.7)	147		
Respondent's occupation															
Unemployed	4 (26.7)	11 (73.3)	15	5.363	0.308	9 (40.9)	13 (59.1)	22	12.418	0.029*	5 (35.7)	9 (64.3)	14	1.335	0.721
Professional/ technical/ma nagerial	4 (18.2)	18 (81.8)	22			8 (26.7)	22 (73.3)	30			10 (47.6)	11 (52.4)	21		
Clerical/sale s and services	65 (36.7)	112 (63.3)	177			9 (31.0)	20 (69.0)	29			89 (51.4)	84 (48.6)	173		
Skilled and unskilled/ma nual others	10 (30.3)	23 (69.7)	33			7 (20.6)	27 (79.4)	34			16 (50.0)	16 (50.0)	32		

Continued.

Variables	Knowledge					Attitude					Practice				
	Poor N (%)	Good N (%)	Total N (%)	X	P value	Poor N (%)	Good N (%)	Total N (%)	X	P value	Poor N (%)	Good N (%)	Total (N) %	X	P value
Respondent's occupation															
Health worker	1 (6.2)	15 (93.8)	16	2.655	0.013*	1 (6.2)	15 (93.8)	16	2.655	0.013*	5 (33.3)	10 (66.7)	15	1.980	0.159
Non-health worker	51 (22.7)	177 (77.3)	213			51 (22.7)	177 (77.3)	213			110 (52.1)	101 (47.9)	211		
Monthly household income (Naira)															
0-10000						9 (40.9)	13 (59.1)	22	12.418	0.029**	11 (50.0)	11 (50.0)	22	1.626	0.898
11000-20000						8 (26.7)	22 (73.3)	30			17 (58.6)	12 (41.4)	29		
21000-30000						9 (31.0)	20 (69.0)	29			15 (51.7)	14 (48.3)	29		
31000-50000						7 (20.6)	27 (79.4)	34			17 (51.5)	16 (48.5)	33		
51000-100000						7 (20.6)	27 (79.4)	34			17 (48.6)	18 (51.4)	35		
Above 100000						2 (5.3)	36 (94.7)	38			16 (43.2)	21 (56.8)	37		
Number of ANC visits															
<4 times	47 (41.6)	66 (58.4)	113	5.959	0.015*	26 (23.4)	85 (76.6)	113	0.091	0.763	63 (57.3)	47 (42.7)	110	4.297	0.038*
≥4 times	36 (26.9)	98 (73.1)	134			29 (21.8)	104 (78.2)	133			57 (43.8)	73 (56.2)	130		
Parity															
Never	39 (39.8)	59 (60.2)	98	2.792	0.095	23 (24.2)	72 (75.8)	95	0.248	0.618	47 (49.0)	49 (51.0)	96	0.069	0.792
Ever	44 (29.5)	105 (70.5)	149			32 (21.5)	117 (78.5)	149			73 (50.7)	71 (49.3)	144		
Gestational age at booking															
1st trimester	22 (34.9)	41 (65.1)	63	0.086	0.958	10 (15.9)	53 (84.1)	63	3.970	0.137	29 (49.2)	44 (74.6)	59	1.961	0.375
2nd trimester	54 (33.3)	108 (66.7)	162			42 (26.4)	117 (73.6)	159			83 (52.2)	100 (62.9)	159		
3rd trimester	7 (31.8)	15 (68.2)	22			3 (13.6)	19 (86.4)	22			8 (36.4)	14 (63.6)	22		
Gestational age at field visit															
2nd trimester	29 (52.7)	26 (47.3)	55	11.598	0.001*	8 (14.8)	46 (85.2)	54	2.371	0.124	36 (67.9)	17 (32.1)	53	8.742	0.003*
3rd trimester	54 (28.1)	138 (71.9)	192			47 (24.7)	143 (75.3)	190			84 (44.9)	103 (55.1)	187		

Continued.

Variables	Knowledge					Attitude					Practice				
	Poor N (%)	Good N (%)	Total N (%)	X	P value	Poor N (%)	Good N (%)	Total N (%)	X	P value	Poor N (%)	Good N (%)	Total (N) %	X	P value
Health facility type															
Primary health care (PHC)	22 (26.5)	28 (17.1)	83 (100)	6.961	0.138	19 (34.5)	31 (16.4)	55 (100)	13.31	0.010*	29 (24.2)	21 (17.5)		17.192	0.002*
Secondary health facility (SHF)	15 (18.1)	35 (21.3)	164 (100)			11 (20.0)	39 (20.6)	163 (100)			23 (19.2)	27 (22.5)			
Tertiary health facility (THF)	13 (15.7)	37 (22.6)				4 (7.3)	43 (22.8)				22 (18.3)	27 (22.5)			
Private maternity hospital (PH)	12 (14.5)	35 (21.3)				12 (14.5)	39 (20.6)				12 (10.0)	30 (25.0)			
Mission homes (MH)	21 (25.3)	29 (17.7)				13 (23.6)	37 (19.6)				34 (28.3)	15 (12.5)			

*Significant difference at p<0.05

Table 5: Association between respondents' source of information and their maternal nutrition action knowledge, attitude and practice.

Variables (n=244)	Composite knowledge score (n=244)		Composite attitude score (n=241)		Composite practice score (n=237)	
	R	P value	R	P value	R	P value
Number of nutrition information sources	0.304	0.000*	0.109	0.090	0.185	0.004*

*Significant difference at p<0.05

Similarly, attitude score increased with increasing educational level of respondent and spouse ($p<0.01$). Respondents whose occupation belong to professional/managerial category had good attitude score compared to those in other occupational categories ($p<0.05$). A statistically significant higher proportion (94.7%) of respondents who earned higher per month, had good knowledge compared to those who earned less ($p<0.05$). Furthermore, a statistically significant higher proportion of respondents who reported their occupation nature as health worker had good attitude score compared to non-health workers, $p<0.05$.

Also, a high proportion (73.1%) of respondents who made at least four or more ANC visits had good composite knowledge score compared to 58.4% of those who made less than four visits, $p<0.05$. Furthermore, a statistically significant higher proportion (71.9%) of respondents who were in their third trimester at field visit had good knowledge score compared to 47.3% of those who were in their second trimester of pregnancy. However, further analysis revealed that a higher proportion (61.5%) of respondents in their 3rd trimester at field visit had made 4 or more ANC visits as compared to only 29.1% of respondents in their 2nd trimester, $p<0.01$. A higher proportion (56.2%) of respondents who had visited ANC for 4 or more times had good practice score compared with less than half (42.7%) of those who had visited ANC less than four times, $p<0.05$.

Also, a statistically significant proportion (55.1%) of respondents who were in their third trimester of pregnancy had good practice score, compared to 32.1% of those in their second trimester of pregnancy (Table 4). There was a significant positive correlation between the composite knowledge and practice scores of respondents and number of nutrition information sources (Table 5).

DISCUSSION

Most of the respondents in this study were middle aged and mostly had at least secondary education which had a semblance to a similar study in literature.[22] About half of the respondents in this study were multigravida and had attended antenatal clinics more than four times prior to the study which showed some form of compliance but was short of recent recommendations for women in their third trimester.[10] According to WHO, a pregnant woman should attend antenatal clinic for at least 8 times before delivery.[23]

In this study, a higher percentage of respondents had good composite knowledge which is similar to a study by where a larger percentage had satisfactory knowledge.[10] This may be attributed to the relatively good attendance at antenatal clinics for counselling. Studies carried out in Ethiopia, Kenya and India explained that pregnant women's knowledge and attitudes toward dietary and health practices were influenced by counselling and health information provided by health professionals during visits to health institutions.[24-27] Also, the mean knowledge score of respondents on the domain of optimal dietary intake was significantly higher in other facilities but lowest for those women who attended the primary health centers. On the other hand, mean knowledge score of respondents on the domain supportive lifestyle and care was significantly higher in tertiary health facilities than every other health facility. This is similar to a study carried out in a tertiary health facility, where most of the respondent had satisfactory knowledge towards optimal diet during pregnancy which was attributed to their level of education.[10] This observed difference in knowledge may be attributed to variation in respondents' sources of nutrition information or variation in nutrition information received by pregnant women across health facilities as suggested in previous assessments especially if there is no national guideline.[28] This suggests the importance of developing and institutionalizing a regularized maternal nutrition action messages by health care workers. Findings from this study also revealed that a relatively lower proportion of respondents had poor composite attitude towards maternal nutrition actions. This finding is in contrast to studies carried out among women attending large urban tertiary hospitals in Ethiopia and India respectively where the attitude of respondent was overall optimal.[10,22,24] However, the results in this study align with a similar investigation among Swiss and Syrian women in rural, disadvantaged economic circumstances.[26,29] These observations suggest that the economic status and the choice of antenatal clinic could have some influence on the attitude to maternal nutrition actions of the pregnant woman.

In this study, only half of respondents had good composite practice of maternal nutrition actions during pregnancy. Nevertheless, a significantly lower proportion of respondents from maternity homes and primary healthcare centres had good composite practice score compared to other health facility types. This finding-when compared to literature- showed that women attending smaller and rural clinics had a slightly higher proportion of women having good practice of maternal nutrition actions compared to those attending urban and larger clinics.[22,30] This statistically significant trends are in contrast to knowledge scores (diet domain) and attitude scores which indicate a different pattern. The trends suggest that an overall advantage existed for women who attended clinics in larger health facilities who likely had more experienced health workers. Result further showed that respondents' knowledge of maternal nutrition actions increased with increasing educational level however, the observed relationship was not statistically significant. The information corroborates the study carried out in Eastern Ethiopia where it was found out that respondent knowledge increases with level of education.[24] This may be due to the ability of educated respondent to interpret and utilize written information resources like articles and other educational materials that are published online, in newspapers, on flyers, and in books. These findings were also corroborated by literature findings from Africa and Asia.[14,22,31] Also in this study, the increased exposure to

more information sources associated positively with the knowledge, attitude and practice of essential nutrition actions. This suggests that the influence of regular and social media may be an underlying factor in the knowledge and practice of recommended actions. Also, a study corroborates that maternal educational status and occupation were found to be factors associated with nutritional knowledge, thus indicating exposure to information outside the antenatal clinic is a main factor.[22] In this study, the respondent's occupation was statistically significant to their knowledge and attitude. This is supported by a previous study done in Malaysia and Egypt in which the nutrition knowledge was associated with women's occupation.[31,32] This may be attributed to the fact that women who work outside their homes are likely to have access to more nutritional information than those who stay at home all day. Higher parity of respondents was statistically significant to their maternal nutrition knowledge and was found in similar settings.[22,33] This association may be related to mothers' increased nutrition knowledge as a result of repeated exposure to nutrition information during antenatal follow-up.

CONCLUSION

The findings that pregnant women in this setting possess overall good knowledge and favorable attitudes but poor practice of essential nutrition actions have several broader implications for maternal and child nutrition. Despite being well-informed about essential nutrition actions and holding positive attitudes towards them, the inability to translate this knowledge into practice indicates systemic and contextual barriers, some of which this study identified. This study showed that respondents who attended larger tertiary facilities had better practice of ENA compared to those who attended smaller primary facilities or mission homes which may be due to the quality of maternal nutrition messages and trust that respondents had in the health workers. These findings point to attendance of antenatal care and quality of maternal messages passed across there as a valid concept for improving maternal nutrition. Another factor was the multiple sources of information especially media which influenced their knowledge, attitude and practice outcomes suggesting the role of increased media usage especially social media channels. The overall implication of this results is that poor practice of the essential actions can lead to continued poor nutritional outcomes for both mothers and children, as the benefits of good nutrition during pregnancy are not realized.

ACKNOWLEDGEMENTS

The authors would like to thank the respondents who participated in the study. The first author is particularly grateful to the staff and students of the Department of Human Nutrition and Dietetics who assisted the process of data collection and analysis during his Master's programme.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Olukemitan TO, Eyinla TE, Samuel FO. Knowledge and practice of essential nutrition actions among pregnant women in Ibadan, South-western Nigeria. Int J Community Med Public Health 2024;11:3023-31.