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Food safety knowledge and practice among pregnant women: a cross sectional study in Ghana

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Authors Contributions

EA was involved in the study conceptualization, data collection and analysis, interpretation of results and drafting of the manuscript. AA reviewed the entire manuscript and provided technical interpretation to the manuscript. WD was involved in data analysis and interpretation of study findings.

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Ethics approval and consent to participate

Approval was given by the Ghana Health Services Ethics Review Committee – (approval no. GHS-ERC: 89/05/17) and permission was obtained from St Francis Xavier Hospital, Assin Foso. Next, we explained the purpose of the study to all study participants and assured them of confidentiality

and privacy of their information. Afterwards, we obtained a verbal consent from all participants before the commencements of the study, and offered them their right to refuse to participate or withdraw from the study at any given time.

Consent for publication

Not applicable.

Availability of data and materials

The data used to support the findings of this study can be made available upon reasonable request from the corresponding author (abramassan@gmail.com)

Competing interests

The authors have declared that they have no competing interests.

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Significance for public health

The occurrence of foodborne disease remains a significant public health burden. However, foodborne disease is preventable by following simple food hygiene steps or practices including safe food handling and preparation practices. There is the need for awareness creation about foodborne disease targeting socio-demographic factors like employment status, period of pregnancy and educational level of community members. This could help improve the understanding and practices about food safety thereby preventing foodborne disease and its associated risk factors.

Abstract

Background: Foodborne disease is a growing public health concern worldwide, especially among vulnerable populations. Improved understanding of food safety practices is fundamental to addressing the phenomenon. This study aimed to assess the socio-demographic factors influencing knowledge and practice of food safety among pregnant women in Ghana.

Design and Methods: This is a cross-sectional study. Self-administered questionnaires were distributed in person to participants during data collection. Data was entered and analysed in Epi Data version 3.1 and Stata 12, respectively. Chi square test and Fischer's exact test were used to determine association between independent variables and outcome variables (knowledge and practice). Binary logistic regression was used to test the strength of the association between independent and outcome variables at 95% confident interval. A p-value of 0.05 or less was considered significant.

Results: Findings were: about 87.06% of the respondents had satisfactory knowledge on food safety; approximately 58.2% of respondents knew how to prevent foodborne disease but about 51.18% had unsatisfactory practice about food safety; about 28.2% of participants had experienced foodborne disease before in the past 6 months. Also, employment status and period of pregnancy were found to have significant influence on food safety knowledge whereas educational level and employment status also had significant influence on food safety practice.

Conclusion: Improved understanding about food safety will not necessarily lead to high food safety practices. In the quest to effectively prevent foodborne disease, we recommend an increase in awareness creation regarding foodborne disease and its associated socio-demographic risk factors like employment status, period of pregnancy and educational level.

Key words: Foodborne disease; food safety; knowledge; practice; pregnant women.

Introduction

Sustainable Development Goal (SDG) 3 aims to promote healthy lives and well-being for all by 2030. However, foodborne diseases (FBDs) pose a greater threat to public health[1] and efforts to attain sustainable health development. FBDs contribute greatly to health burdens in lower middle-income countries (LMIC) like that of malaria, HIV/AIDS and tuberculosis[2]. According to the World Health Organization (WHO) report (2015), globally, approximately 600 million (1 in every 10 people) fall ill after consuming contaminated food – resulting to about 420,000 deaths – the majority occurring in the African region[3].

In Ghana, about 65,000 outpatients are diagnosed of FBDs every year, and at a total cost of US$69 million to the economy[4].There are several predisposing factors that contribute to the FBDs such as poor personal hygiene, poor sanitation, and poor attitudes towards food hygiene and overcrowding[5]. While FBDs are more likely to cause serious illness among vulnerable groups, including pregnant women and children[6, 7] yet most people do not consider themselves or their

family at risk of the disease[8]. It is therefore important to understand what factors are associated with foodborne diseases. Besides, knowledge and practice of food safety are closely linked to foodborne diseases[8, 9]. This study aimed to assess the socio-demographic factors influencing knowledge and practice of food safety among pregnant women in Ghana.

Design and Methods

This is a descriptive cross-sectional quantitative study. Data was gathered from November 2017 through December 2017 among pregnant women attending ANC services at Assin Foso, St. Francis Xavier Hospital. The study population was drawn from the ANC register after receiving permission from the head of the facility. Next, a verbal consent was obtained from study participants before commencement of data collection.

Sampling Method

The sample size was determined using the formula: n=Z^2.(P(1-P))/W^2 – where n is the minimum sample size, Z is the confident level, P is the population proportion and W is the margin of error. The confidence level was 95%; 87.9% proportions of participants with good knowledge of food safety from a previous similar study was used[10] and 5% margin of error. The sample size was 181 (including 10% non-response rate). To ensure that study population had equal chance of participation, a simple random sampling method was used to select study participants. First, a sampling frame was prepared from the ANC register. The sampling frame was developed on daily basis from which the sample of pregnant women attending ANC on that given day was drawn. Codes were assigned to each name to ensure confidentially and avoidance of selection bias. Through the lottery sampling approach, 181 participants were selected for the study.

Data Collection

A tailored version of a questionnaire developed by Stratev *et al.*[11] was adopted for our study – for being applicable to our context. Questionnaires used comprised of 8 questions on demographic characteristics, 19 questions on knowledge and 18 questions on practice. Participants were asked to fill the questionnaire after receiving their antenatal care at the facility.

Data Analysis

Data was entered and analysed in Epi Data version 3.1 and Stata 12, respectively. Descriptive analysis was conducted to assess food safety knowledge and practice. We divided knowledge score into satisfactory (participants who had more than ten correct scores on food safety knowledge), and unsatisfactory (participants who scored from zero to ten) – and likewise for practice (refer

Tables 1 and 2). Chi square test and Fischer's exact test were used to determine association between independent variables and outcome variables (knowledge and practice). Binary logistic regression was used to test the strength of the association between independent and outcome variables at 95% confident interval. A p-value of 0.05 or less was considered significant.

Findings

Demographic Characteristics of Respondents

Of the 181 participants recruited for the study, a total of 170 pregnant women gave their consent and completed the survey. About 4.12% were below the age of 18 years, 21.18% were between the ages of 18-24 years, 59.41% were between the ages of 25-34 and 15.29% were 35+. Most of the study respondents had basic education – primary (7.65%) and junior high (52.94%). Again, most of the respondents were Akan (88.82%). Almost all the respondents (97.06%) were Christians. About 52.35% of study respondents were full-time employees. Almost half of the respondents were petty traders (48.84%). Again, more than half of the respondents were in their 3rd trimester (61.18%). Moreover, about 47.65% had 2 or more children (Table 1).

Knowledge Level on Food Safety

Approximately 87.06% of study participants had satisfactory knowledge about food safety. About 69.4% of the respondents were aware of foodborne diseases. Participants who had experienced foodborne disease at least once in the last 6 months prior to the study was 28.2%. Also, 58.2% knew how to prevent foodborne disease. Again, 97.6% of the respondents agreed that unkempt nails could easily spread microbes. Also, 86.5% of them asserted that inadequate cooking of raw foods like meat and chicken thus cooking below 165 °F (less than 20 minutes) could result in outbreak of foodborne disease. Moreover, 52.9% of the respondents knew that washing of the hands after handling raw foods could prevent foodborne disease (Table 2).

Practice Level on Food Safety

Based on the findings of the study, 51.18% of participants exhibited unsatisfactory practice about food safety. Also, 118 (69.4%) of the respondents always washed their hands before and after cooking with 2.4% reported of never washing their hands before and after cooking. Again, 48.8% of them always used their hands to cover their mouth while coughing or sneezing when cooking. Also, 20.6% of respondents always tasted and dished out food with unprotected hands, and 60.6% always thaw frozen food outside the refrigerator. Moreover, 77.1% of the respondents never used an apron when cooking (Table 3).

Demographic Factors Influencing Knowledge and Practice of Food Safety

According to findings of the study, employment status had an association with knowledge about food safety. Also, period of pregnancy had an association with food safety knowledge. While number of children had association with food safety knowledge, the relationship was not statistically significant after adjusting for confounding variables (Table 4).

Moreover, age, ethnicity and occupation had association with practice about food safety with p-value of 0.019, 0.013 and 0.048 respectively. However, these associations were not statistically significant. Also, educational level had an association with food safety practice. Although knowledge level had association with practice level, this association was not statistically significant after adjusting for confounding variables (Table 5).

Discussion

The prevalence of foodborne diseases is an indicator of underlying food safety problems which can be attributed to the level of food safety knowledge and practice among food handlers and consumers[12]. This study reported a relatively higher knowledge about food safety compared with a study conducted among similar study population[13]. The level of education of study participants in this study had no influence on food safety knowledge. Samapundo *et al*. (2014) reported similar findings[14], however, this was contrary to the findings by Thanh (2015) who reported a significant association between level of education and food safety knowledge[15]. Studies have shown that those who study health-related courses often have improved knowledge about food safety[16]. We perceive this might be because majority of our respondents had basic education and those with tertiary education may have studied other non-health related program. Moreover, education on food hygiene, instead of the level of education may also account for the high food safety knowledge among the respondents in this study[17].

Again, there was no association between the age group of the respondents in this study and food safety knowledge. Although this finding was supported by a study conducted in 2017[11], however Rahman, Arif, Bakar and Tambi in 2016 reported otherwise in their study[18].

Our study revealed an association between employment status and food safety knowledge. Part-time and full-time homemaker employment status had statistically significant influence on knowledge about food safety. This may be due to availability of time participants under this category of employment status have to either listen or watch public health educational programs on food safety on radio or television. However, this finding did not correlate with the findings of

a similar study conducted among Saudi Mothers which highlighted that employment status had no significant impact on food safety knowledge and practices[19].

Although there was an association between period of pregnancy and knowledge level about food safety however, only 3rd trimester had statistically significant influence on food safety knowledge. According to Trepka *et al*. (2007) a woman's being pregnant and the number of children she had at the time pregnancy had significant impact influence on food safety[20] but the findings of this study pointed out that period of pregnancy and the number of children at the time of pregnancy had no significant influence.

Moreover, although about 69.4% of the respondents were aware of foodborne disease, 58.2% of the participants knew how to prevent it, and 48.2% of participants did not consider themselves at risk of foodborne diseases. Similar results were observed in a study that highlighted that respondents did not know that they were susceptible to foodborne disease[8].

While participants in our study had improved knowledge about food safety, food safety practice was unsatisfactory - like finding of a study conducted in 2014 which reported poor adherence to correct food-handling practices (44.8%) [16]. Nonetheless, these are contrary to the findings of a study conducted among veterinary students at Trakia University, Bulgaria[11] – perhaps, might be due to the fact that the study was conducted among university students who are perceived to have high educational level. In other study, although food safety knowledge of the respondents was high, participants failed to portray good practices due to time constraints and poor economic status[21].

Furthermore, our findings revealed a significant associated between educational level, employment status and food safety practice with junior high, tertiary educational levels and part time employment status all influencing practice level significantly. However, a study conducted by Monney, Aggei and Owusu reported no statistically significant relationship between the education level and food hygiene practices[17].

Although there was association between knowledge level and practice level, this association was not statistically significant, a study conducted in Nigeria disagree with this finding[22]. On the other hand, there was no significant association between age of respondents and food safety practice – similar to the findings of a different study[11]. Yet, a study conducted among food vendors in primary schools reported significant association between age and food safety practice[22].

Thawing meat and poultry product outside the refrigerator increase the risk of bacterial growth and food spoilage[23]. Yet, about 60.6% of the respondents in this study always thaw frozen food outside the refrigerator. This finding was in conformity with the findings of a study which reported that 61.59% of female respondents always thaw frozen meat at room temperature[24]. The act of thawing food at room temperature maybe because it is much faster than that of the refrigerator. Besides, most people consider such practice to be appropriate[10].

Moreover, majority of our respondents always wash their hands before and after cooking. However, 40.6% of participants always wear accessories when washing their hands and cooking. Further, only 8.8% of the respondents always wear apron or protective clothing when cooking, contrary to the findings of study conducted among kitchen staff in Training College of Education in Hohoe where about 78% of respondents wore protective clothing when cooking[25]. Regularly, most people do not recognize the need to use any protective clothing when cooking since wearing of aprons have been attributed to food handlers in food establishments[22], in addition to other economic barriers[21].

Implications for Policymakers

There following are recommended to foster progress towards addressing the burden of foodborne disease.

1. There is the need for health education and promotion activities on food safety issues for pregnant women during their routine antenatal visits.
2. There should be a continuous creation of awareness on food safety issues and its relation to foodborne diseases and the impact of foodborne diseases on the general population especially among vulnerable groups.
3. Also, foodborne disease surveillance units should be strengthened to help provide accurate and reliable data for policy making.

Limitation of the Study

Practices of food safety were self-reported, and no observation was carried out by the researchers to confirm responses provided by participants. Hence, there could be a possibility of people over reporting good food safety practices, because they may not want to accept poor practices or might believe they are performing good practices, although, they may be wrong. Again, the questionnaire

used may also have influenced the outcome of the study since it was adopted from a study among tertiary students.

Conclusion

A cross-sectional descriptive study involving pregnant women was conducted to assess the socio-demographic factors influencing knowledge and practice regarding food safety. Findings were:

- Knowledge of participants about food safety was satisfactory.
- Food safety practice was unsatisfactory.
- Employment status and period of pregnancy had significant influence on food safety knowledge.
- Employment status and educational level had significant influence on food safety practice.

Lessons from our study indicate that, improved understanding about food safety will not necessarily lead to satisfactory food safety practices. Hence, in the quest to effectively prevent foodborne disease and its associated risk factors, we recommend greater investment in health education and promotion, including awareness creation about foodborne disease targeting socio-demographic factors like employment status, period of pregnancy and educational level.

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Table 1. Demographic characteristics of participants.

Characteristics	Level	Frequency (n=170)	Percentage
Age			
	< 18	7	4.12
	18 - 24	36	21.18
	25 - 34	101	59.41
	35+	26	15.29
Educational level			
	Primary	13	7.65
	JHS	90	52.94
	SHS	28	16.47
	Tertiary	29	17.06
	None	10	5.88
Ethnicity			
	Akan	151	88.82
	Ewe	13	7.65
	Ga	2	1.18
	Others	4	2.35
Religion			
	Christianity	165	97.06
	Islam	5	2.94
Employment status			
	Full time	89	52.35
	Part time	40	23.53
	Full time homemaker	29	17.06
	Student	12	7.06

Occupation			
	Farming	16	12.40
	Petty trading	63	48.84
	Civil servant	9	6.98
	Public servant	12	9.30
	Fashion designer	29	22.48
Period of pregnancy			
	1st trimester	29	17.06
	2nd trimester	37	21.76
	3rd trimester	104	61.18
Number of children			
	None	43	25.29
	1 who is less than 1 year	2	1.18
	1 who is 1 year or older	44	25.88
	2 or more	81	47.65

Table 2. Food safety knowledge among pregnant women (n=170).

Food safety knowledge	Yes		No		I don't know	
	n	%	n	%	n	%
Are you aware of foodborne disease	118	69.4	17	10.0	35	20.6
Have you experienced foodborne disease before	48	28.2	79	46.5	43	25.3
Do you know how to prevent foodborne disease	99	58.2	33	19.4	38	22.4
Are children, pregnant women and older individuals more at risk of foodborne disease	78	45.9	10	5.9	82	48.2
Can the use of gloves while handling food reduces the risk of food contamination?	103	60.6	54	31.8	13	7.6
Can hand washing before cooking reduces the risk of food contamination?	137	80.6	26	15.3	7	4.1
Can washing of hands after handling raw food prevents foodborne disease?	90	52.9	22	12.9	58	34.2
Can foodborne disease be transmitted through contaminated food?	145	85.3	9	5.3	16	9.4
Can microorganisms be found on the surface of human skin, nose and mouth of healthy handlers	92	54.1	52	30.6	26	15.3
Can personal hygiene prevent food contamination	136	80.0	23	13.5	11	6.5
Can contaminated water be a vehicle for foodborne disease transmission	147	86.5	14	8.2	9	5.3

Can storing raw and cooked food together cause contamination of food	113	66.5	33	19.4	24	14.1
Can food handler having diarrhea, flu and sore throat pose risk of food contamination	127	74.7	27	15.9	16	9.4
Does leftover food smelling good still safe to eat	108	63.5	55	32.4	7	4.1
Can dishing, serving and tasting food with unprotected hand cross contaminate the food	156	91.8	4	2.3	10	5.9
Can unkempt and dirty nails easily spread microbes	166	97.6	2	1.2	2	1.2
Can uncovered abrasion or cuts on fingers and hands cause cross contamination of food?	150	88.2	7	4.1	13	7.7
Can foodborne disease be acquired from consumption of contaminated food	155	91.2	6	3.5	9	5.3
Can inadequate cooking of raw food like meat, chicken and vegetable cause outbreak of foodborne disease	147	86.5	5	2.9	18	10.6

Table 3. Food safety practice among pregnant women (n=170).

Food safety practice	Never		Sometimes		Always	
	n	%	n	%	n	%
Do you wash your hands before and after cooking	4	2.4	48	28.2	118	69.4
Do you consume food kept at room temperature for long	85	50.0	68	40.0	17	10.0
Do you use your hand to cover your mouth while coughing or sneezing?	39	22.9	48	28.2	83	48.8
Do you taste and dish out food with unprotected hands?	98	57.6	37	21.8	35	20.6
Do you read labels with the use by and or expiry date of packaged food before purchasing?	22	12.9	35	20.6	113	66.5
Do you read conditions of use and storage of packaged food?	34	20.0	79	46.5	57	33.5
Do you wash fruits and vegetables before eating?	10	5.9	36	21.2	124	72.9
Do you wash eggs before cooking or frying them?	42	24.7	32	18.8	96	56.5
Do you wash and rinse cutting boards, knives and plates used for raw meat before using them for other food?	7	4.1	23	13.5	140	82.4
Do you defreeze frozen food outside the refrigerator?	40	23.5	27	15.9	103	60.6
Do you wear accessories like rings, bracelets when coking food?	69	40.6	36	21.2	65	38.2
Do you use an apron when cooking?	131	77.1	24	14.1	15	8.8

Do you store raw chicken or meat separately from other food?	26	15.2	38	22.4	106	62.4
Do you wash dishes with detergent and water or in a dishwasher after preparing food and before new usage?	53	31.2	4	2.3	113	66.5
Do you wash your hands before handling raw food?	42	24.7	50	29.4	78	45.9
Do you cover your cut with bandage and use gloves?	15	8.8	40	23.5	115	67.7
Do you keep food unrefrigerated for more than 2 hours?	104	61.2	34	20.0	32	18.8
Do you protect raw food from insects and rodents?	4	2.4	17	10.0	149	87.6

Table 4. Association between demographic factors of pregnant women and knowledge level on food safety.

	Knowledge Level				
Demographic Factors	**Unsatisfactory n (%)**	**Satisfactory n (%)**	**p-value**	**COR (95%CI) p-value**	**COR (95%CI) p-value**
Age			0.060		
< 18	2 (9.09)	5 (3.38)		1	-
18 - 24	7 (31.82)	29 (19.59)		1.66 (0.26, 10.39) 0.590	
25 - 34	8 (36.36)	93 (62.84)		4.65 (0.77, 27.90) 0.093	
35+	5 (22.73)	21 (14.19)		1.68 (0.25, 11.32) 0.594	
Educational level			0.174		
Primary	2 (9.09)	11 (7.43)		1	-
JHS	9 (40.91)	81 (54.73)		1.64 (0.31, 8.58) 0.560	
SHS	7 (31.82)	21 (14.19)		0.55 (0.10, 3.08) 0.493	
Tertiary	2 (9.09)	27 (18.24)		2.45 (0.31, 19.68) 0.398	
None	2 (9.09)	8 (5.41)		0.73 (0.08, 6.31) 0.773	
Ethnicity			0.736		
Akan	20 (90.91)	131 (88.51)		1	-
Ewe	1 (4.55)	12 (8.11)		1.83 (0.23, 14.86) 0.571	
Ga	0 (0.00)	2 (1.35)		1 (-)	

Others	1 (4.55)	3 (2.03)		0.46 (0.05, 4.62) 0.508	
Religion			0.126		
Christianity	20 (90.91)	145 (97.97)		1	-
Islam	2 (9.09)	3 (2.03)		0.21 (0.03, 1.31) 0.095	
Employment status			0.013 *		
Full time	5 (22.73)	84 (56.76)		1	1
Part time	9 (40.91)	31 (20.95)		0.21 (0.06, 0.66) 0.008 *	0.25 (0.07, 0.85) 0.026 *
Full time homemaker	2 (27.27)	23 (15.54)		0.23 (0.06, 0.82) 0.023 *	0.24 (0.07, 0.89) 0.033 *
Student	2 (9.09)	10 (6.76)		0.30 (0.05, 1.74) 0.179	0.27 (0.04, 1.66) 0.158
Occupation			0.390		
Farming	2 (14.29)	14 (12.17)		1	-
Petty trading	10 (71.43)	53 (46.09)		0.76 (0.15, 3.86) 0.738	
Civil servant	0 (0.00)	9 (7.83)		1 (-)	
Public servant	1 (7.14)	11 (9.57)		1.57 (0.13, 19.67) 0.726	
Fashion designer	1 (7.14)	28 (24.35)		4.00 (0.33, 47.99) 0.274	
Period of pregnancy			0.006 *		
1st trimester	9 (40.91)	20 (13.51)		1	1
2nd trimester	5 (22.73)	32 (21.62)		2.88 (0.84, 9.83) 0.091	3.07 (0.85, 11.05) 0.086
3rd trimester	8 (36.36)	96 (64.86)		5.40 (1.86, 15.70) 0.002*	4.64 (1.52, 14.17) 0.007 *

Number of children			0.048 *	
None	11 (50.00)	32 (21.62)	1	
<1 year	0 (0.00)	2 (1.35)	1 (-)	
≥1 year	5 (22.73)	39 (26.35)	2.68 (0.84, 8.52)	0.094
≥2	6 (27.27)	75 (50.68)	4.30 (1.46, 12.62)	0.008 *

*p<0.05; COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio

Table 5. Association between demographic factors, knowledge level of pregnant women and knowledge level on food safety.

Demographic Factors	Practice Level Unsatisfactory n (%)	Satisfactory n (%)	p-value	COR (95%CI) p-value	COR (95%CI) p-value
Age			0.019 *		
< 18	6 (6.90)	1 (1.20)		1	1
18 - 24	24 (27.59)	12 (14.46)		3.00 (0.32, 27.83) 0.334	3.71 (0.33, 42.18) 0.290
25 - 34	43 (49.43)	58 (69.88)		8.09 (0.94, 69.72) 0.057	10.54 (0.89, 124.42) 0.061
35+	14 (16.09)	12 (14.46)		5.14 (0.54, 58.94) 0.154	5.37 (0.41, 69.65) 0.199
Educational level			0.000 *		
Primary	11 (12.64)	2 (2.41)		1	1
JHS	36 (41.38)	54 (65.06)		8.25 (1.73, 39.44) 0.008 *	9.80 (1.87, 51.21) 0.007 *
SHS	23 (26.44)	5 (6.02)		1.20 (0.20, 7.16) 0.845	1.21 (0.18, 7.96) 0.845
Tertiary	10 (11.49)	19 (22.89)		10.45 (1.93, 56.64) 0.007 *	6.35 (1.07, 37.66) 0.042 *
None	7 (8.05)	3 (3.61)		2.36 (0.31, 17.85) 0.407	3.58 (0.42, 30.81) 0.245
Ethnicity			0.013*		
Akan	73 (83.91)	78 (93.98)		1	-
Ewe	11 (12.64)	2 (2.41)		0.17 (0.04, 0.79) 0.024 *	
Ga	0 (0.00)	2 (2.41)		1.00 (-)	

Others	3 (3.45)	1 (1.20)		0.31 (0.03, 3.07) 0.318	
Religion			1.000		
Christianity	84 (96.55)	81 (97.59)		1	-
Islam	3 (3.45)	2 (2.41)		0.69 (0.11, 4.25) 0.690	
Employment status			0.000 *		
Full time	32 (36.78)	57 (68.67)		1	1
Part time	27 31.03v	13 (15.66)		0.27 (0.12, 0.60) 0.001 *	0.31 (0.12, 0.79) 0.014 *
Full time homemaker	19 (21.84)	10 (12.05)		0.30 (0.12, 0.71) 0.007 *	0.71 (0.23, 2.17) 0.542
Student	9 (10.34)	3 (3.61)		0.19 (0.05, 0.74) 0.017 *	0.54 (0.10, 2.90) 0.474
Occupation			0.048 *		
Farming	10 (16.95)	6 (8.57)		1	-
Petty trading	30 (50.85)	33 (47.14)		1.83 (0.59, 5.66) 0.292	
Civil servant	5 (8.47)	4 (5.71)		1.33 (0.25, 7.01) 0.734	
Public servant	1 (1.69)	11 (15.71)		18.33 (1.87, 179.90) 0.013 *	
Fashion designer	13 (22.03)	16 (22.86)		2.05 (0.59, 7.15) (0.260)	
Period of pregnancy			0.885		
1st trimester	16 (18.39)	13 (15.66)		1	-
2nd trimester	19 (21.84)	18 (21.69)		1.17 (0.44, 3.09) 0.758	

3rd trimester	52 (59.77)	52 (62.65)		1.23 (0.54, 2.81) 0.622	
Number of children			0.296		
None	26 (29.89)	17 (20.48)		1	-
<1 year	0 (0.00)	2 (2.41)		1 (-)	
≥1 year	21 (24.14)	23 (27.71)		1.68 (0.72, 3.92) 0.235	
≥2	40 (45.98)	41 (49.40)		1.57 (0.74, 3.32) 0.240	
Knowledge level			0.002 *		
Unsatisfactory	18 (20.69)	4 (4.82)		1	1
Satisfactory	69 (79.31)	79 (95.18)		5.15 (1.66, 15.96) 0.004 *	2.57 (0.73, 9.00) 0.141

*p<0.05; COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio