ECRONICON OPEN ACCESS

EC GYNAECOLOGY
Research Article

Knowledge, Attitude and Practice of Health Care during Pregnancy among Sudanese Women in Omdurman Maternity Hospital of Khartoum State, Sudan, in 2019

Einas Ahmed Abdelraheem Hassan*, Amna Muawia Eltayeb Ahmed and Rawya Ismail Mohamed Elbakri

Community Medicine Department, University of Khartoum, Sudan

***Corresponding Author:** Einas Ahmed Abdelraheem Hassan, Community Medicine Department, Faculty of Medicine, University of Khartoum, Omdurman, Khartoum, Sudan.

Received: September 21, 2021; **Published:** October 12, 2021

Abstract

Introduction: Pregnancy, also known as gestation, is the time during which one or more offspring develops inside a woman by sexual intercourse or assisted reproductive technology. Also, it is considered as a hazardous condition for the life of the expecting mothers and their children who lack awareness about healthy pregnancy course and factors that affect their own health, so engagement of women in tackling this problem is crucial.

Objectives: The aim was to assess the knowledge, attitude and practice of the pregnant women toward their health care in Omdurman Maternity Hospital of Khartoum State, Sudan.

Methods: This was a descriptive cross-sectional facilitated based study conducted in Omdurman Maternity Hospital of Khartoum State, Sudan by using a closed ended questionnaire that showed the demographic data and parity status of the participants and their knowledge, attitude and practice regarding their health care during pregnancy. Data was collected between January and February 2019, from 384 participants.

Results: Of the 384 questionnaires, 64.8% had an average knowledge, 61.7% had an average attitude and 75.3% had an average practice regarding their health care during pregnancy. There was no association between the parity status and the knowledge ($p = 0.7$), attitude ($p = 0.5$) and practice ($p = 0.4$) of health care among pregnant women. Maternal educational level was significantly associated with their knowledge ($p = 0.02$) and attitude ($p = 0.001$) regarding their health care during pregnancy. There was association between the knowledge of health care during pregnancy and the attitude ($p = 0.001$). The study has found a statistical association between the practice and attitude ($p = 0.002$) of pregnant women regarding their health care during pregnancy.

Conclusion: The majority of pregnant women had average and poor knowledge, attitude and practice towards their health care during pregnancy. However, the practice of health care was comparatively in better position. Also, the study showed the importance of the educational level as a major factor in the knowledge and attitude of health care during pregnancy.

Keywords: *Knowledge; Attitude; Practice; Health Care; Pregnancy; Sudan*

Abbreviations

CHD: Coronary Heart Disease; CVAs: Cerebrovascular Accidents; ERB: Ethical Review Board; WHO: World Health Organization

Introduction

Pregnancy, also known as gestation, is the time during which one or more offspring develops inside a woman [1]. A multiple pregnancy involves more than one offspring, such as with twins [2]. Pregnancy can occur by sexual intercourse or assisted reproductive technology [3]. Childbirth typically occurs around 40 weeks from the last menstrual cycle [1,4]. This is just over nine months, where each month averages 29 ½ days [1,4].

The most obvious symptom of pregnancy is cessation of periods, "a period of amenorrhea in a woman having regular menstruation [5]".

Other common symptoms of early pregnancy: Nausea and vomiting, Frequency of micturition, Excessive lassitude or fatigue, Breast tenderness or heaviness and Fetal movements or quickening [5].

There are numerous factors that influence the health of the pregnant women like: Folic acid is the only vitamin supplement that is recommended for use before pregnancy and up to 12wks gestation for women who are other-wise eating a healthy balanced diet [5]. Obesity is the most common nutritional disorder in the industrialized world, with increased risks including gestational diabetes and hypertension; also, monitoring and assessment may be difficult during pregnancy and labor [5]. Poor nutrition in pregnant women is associated with the delivery of low birth weight (< 2500g) babies [5]. A nutritious, well-balanced diet includes foods rich in protein, dairy food (which supply calcium), starchy foods, plenty of fruit and vegetables that supply vitamin and fiber [5]. Most drugs carry warnings about use in pregnancy [5]. However, should be consulted before stopping or starting any medication in pregnancy or before conception [5].

Pregnancy has numerous infectious disease related to it for example: rubella virus disrupts mitosis, retarding cellular division and causing vascular damage [5]. Major malformations are most likely during organogenesis with severity decreasing with advancing gestation [5]. Defects include: sensorineural deafness, cardiac abnormalities, eye lesions and mental retardation [5]. Measles also associated with fetal loss and preterm delivery, no congenital infection or damage would be anticipated in a surviving fetus [5]. Regarding chickenpox, fetal infection rate is thought to be 25% in all trimesters: if < 20 weeks there is a 2% risk of fetal varicella syndrome with congenital deafness [5]. Pregnancy increase the risk of developing severe malaria [5]. It can cause miscarriage or preterm delivery, still birth, congenital malaria and low birth weight [5]. Spontaneous miscarriage is common with toxoplasmosis in the first trimester [5]. Defects associated with primary infection include: chorioretinitis, microcephaly, intracranial calcification and mental retardation [5]. Routine antenatal screening was introduced in 1992 as part of the antenatal booking investigations [5]. This is an opt-out policy and has increased the rate of HIV diagnosis significantly [5].

Also, there are multiple medical disorders related to pregnancy for example: [5] Cerebrovascular accidents (CVAs) are rare in women of reproductive age, but there is a high risk in the post-partum period [5]. There is a 9-fold high risk for infracts and 28-folds for hemorrhagic stroke in the first 6 weeks postpartum compared with non-pregnant women [5]. Established diabetes affects 1 - 2% of pregnancies [5]. Without good glycemic control there is increased fetal and neonatal morbidity and mortality [5]. Normally pregnancy has 2-3-fold increase in iron requirements and 10-20-fold increase in folate requirements in pregnancy [5]. The most common cause of anemia in pregnancy is iron deficiency anemia (90%) [5]. 5% cases of anemia are folate deficiency [5]. More common in pregnancy because of dilatation of upper renal tract and urinary stasis [5]. Asymptomatic bacteriuria affects 5 - 10% of pregnant women; untreated it can lead to symptomatic infection in 40% of cases [5].

Pregnancy and childbirth is a natural process which in most cases comes to good end even without any intervention; however relatively high proportion of pregnancies there are complication. Some of which are very serious and of a life-threatening Nature [6]. Some of these complications may be anticipated, because risk factors are present [6]. Globally 25% of maternal death occur during pregnancy with different causes between countries at any point during the course of gestation, delivery or the period after it [7]. About 830 women die from pregnancy- or childbirth-related complications around the world every day [8]. It was estimated that in 2015, roughly 303,000 women died during and following pregnancy and childbirth [8].

Although, there is a great advance in obstetrics in recent year, a hard core of maternal mortality will linger and is considered to be an irreducible minimum. Nevertheless, there has been worldwide decline in maternal mortality over the past decades. Yet maternal mortality is still the major public health problem throughout the world and specially in developing countries like: Sudan. Serious complications can occur during pregnancy period which include haemorrhage and anaemia, hypertensive disorders, genito-urinary infection, neural tube defect and foetal anomalies, all these complications are major factor contributing to maternal death and influence the health of the baby. The complications that occur during pregnancy can be prevented by maintaining the health of pregnant women and insure that they have good knowledge and information related to their health. Also, the results of this study will be used to promote the delivery of high-quality information about pregnancy and its related problems and fill the gap of knowledge through antenatal care centres and medical staff of hospitals.

Objective of the Study

The objective of this study was to evaluate the level of knowledge, attitude and practice of pregnant women about their health care during pregnancy.

Materials and Methods

Study design

This was a descriptive cross-sectional, facility-based study.

Study area

There are three public maternity hospitals in Khartoum State. This study was done in Omdurman Maternity hospital by using randomized selection. Omdurman maternity hospital is in Almawrda, Omdurman Locality, Khartoum State. It is the largest maternity hospital in Sudan. It was founded in 1957. Number of Staff work on it in 2019 = 560. There were 467 beds in the hospital.

Rate of pregnant women per day: They were about 70 - 80 cases per day. Inpatients: approximately wards were full every day.

Study population

Inclusion criteria

1. All Sudanese pregnant women who attended Omdurman maternity hospital.
2. Pregnant women of all ages.
3. Pregnant women of any gestational stage.

Exclusion criteria

- Ladies in labour pain.

Sample size

Equation used: $n = z^2 q p / e^2$

Where: n = Minimum sample size required,

z = Probability that e is not exceeded,

p = Expected prevalence (estimated as 0.5),

q = 1-p,

e = Maximum acceptable random sampling error,

According to the equation above the estimated sample size = 384.

Sampling technique

Systemic random sampling technique.

Data collection method

Questionnaire containing closed-ended questions; five sections and 29 questions which were: 2 questions for demographic section, 3 questions regarding parity section, 7 questions concerning the knowledge section, 7 questions about the attitude section, and 10 questions about the practice of healthcare, inform of interviewing. The questionnaire was translated into Arabic. The questionnaire was pre-tested with some pregnant women in another hospital called Saad Abu Ella, to test the efficacy and flexibility of it. The data was collected between January and February 2019.

Variables

Age, educational level, parity, endogamy, diseases, food, medication and supplements, rest, exercise, excessive heat, whitening creams, source of information, weight, antenatal visit, dental care, breast care.

Data analysis

1. Data was entered and encoded by myself.
2. Data was analysed partly manually and mostly by the computer programs by using SPSS software version 24.
3. Data was displayed and presented in form of tables and charts and I used significance tests for the results.
4. The total score of knowledge was 16 and every right answer was given 1 point. Those who scored 11 and above were considered to have excellent knowledge, those with a score of (6 to 10) had an average knowledge and those who scored 5 and less had poor knowledge.

5. The full score of attitude was 15 and every right answer was given 1 point.

6. The total score of practice was 13. Those who scored 10 and above were considered to have good practice, from (5 to 9) had an average practice and 4 and less had poor practice.

Ethical consideration

1. Ethical approval was taken from IRB and Department of Community Medicine, University of Khartoum.

2. Permission was taken from administrators of Omdurman Maternity Hospital.

3. Consent was obtained from the pregnant women as written consent in the questionnaire.

4. No information that can lead to identification of a specific subject was taken.

Results and Discussion

Sociodemographic characteristic, gravidity and parity status: a facility based Descriptive cross-sectional study was conducted in Omdurman Maternity Hospital of Khartoum State, Sudan, with a (n = 384) pregnant women. They were successfully interviewed, giving response rate of 100%. 53% were between the age of 20 and 30 years, 28.9% were between 31 and 40 years, 15.9% were less than 20 years and 1.6% were 41 years and above. The minimum age was 16 years and the maximum age was 44 years.

Regarding the educational level, 32.8% had only secondary school education, 31.8% had primary school education, 20.1% had university education, 7% had post graduates studies, 4.7% were illiterate and 3.6% had middle school education.

Regarding the parity status, 68% of participants were multiparous and 32% were nulliparous. 16.7% of women had one child, 12.5% had 2 children, 16.1% had 3 children, 14.1% had 4 children, 8.3% had 5 children, 0.3% had 9 children, 0.3% had 8 children and 31.8 had no children. 88% of respondents were in the third trimester, 9.9% were in the second trimester and 1.8% were in the first trimester.

Selected sociodemographic characteristic and parity status of the population are summarized in table 1.

Variables	Percent (100%)	Frequency
Age at last birthday		
Less than 20 years	15.9	61
20 - 30 years	53.6	206
31 -40 years	28.9	111
41 and above	1.6	6
Educational level		
Illiterate	4.7	18
Primary	31.8	122
Middle	3.6	14
Secondary	32.8	126
University	20.1	77
Post graduate studies	7.0	27

Trimester of pregnancy		
First trimester	1.8	7
Second trimester	9.9	38
Third trimester	88.3	339
Number of living children		
No child (first pregnancy)	31.8	122
1	16.7	64
2	12.5	48
3	16.1	62
4	14.1	54
5	8.3	32
6	0.3	1
7	0.3	1
Is this your first pregnancy		
Yes	32.0	123
No	68.0	261

Table 1: *The distribution of sociodemographic characteristic and parity status of pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

64.8% of pregnant women had an average knowledge, 28.9% had poor knowledge and 6.3% had an excellent knowledge about health care during their pregnancy course. The following figure 1 describes the results.

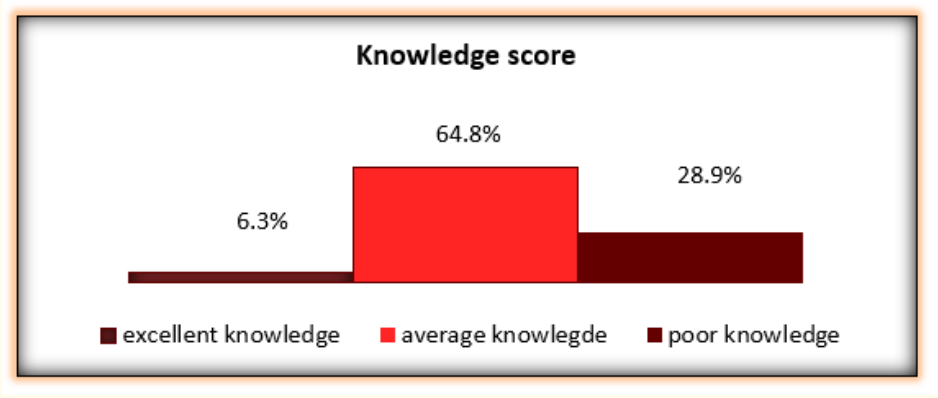

Figure 1: *Distribution of knowledge about health care during pregnancy among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

Regarding the knowledge about symptoms of pregnancy, 96.5% for tiredness and fatigability, 86.2% for missed period, 72.4% for nausea and vomiting, 47.9% for frequent urge to urinate, 51.8% for feeling fetal movement, 37.8% for pain and increased size of breast and 26% for loss of appetite. The table 2 below shows the results.

Symptoms of pregnancy	Frequency	Percent (100%)
Missed period	331	86.2
Nausea and vomiting	278	72.4
Frequent urge to urinate	184	47.9
Tiredness and fatigability	267	96.5
Pain and increased size of breast	145	37.8
Loss of appetite	100	26
Feeling foetal movement	199	51.8
Total	384	100

Table 2: *Distribution of knowledge about symptoms of pregnancy among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

69.3% of participants didn't know about rubella. 28.4% defined rubella as disease that appears in the form of skin rash and fever and 2.3% defined it as disease that appears in the form of fever and vomiting. The table 3 below explains the results.

Rubella	Frequency	Percent (100%)
Disease that appears in the form of fever and vomiting	9	2.3
Disease that appears in the form of skin rash and fever	109	28.4
I don't know	266	69.3
Total	384	100

Table 3: *Distribution of knowledge about rubella among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

60% of women didn't know the symptoms of anemia, 28.4% answered tiredness and fatigability, 23.7% answered fast heartbeats and 30.2% answered insomnia. The table 4 below shows the results.

Symptoms of anaemia	Frequency	Percent (100%)
Tiredness and fatigability	109	28.4
Fast heartbeats	91	23.7
Insomnia	116	30.2
I don't know	232	60.4
Total	384	100

Table 4: *Distribution of knowledge about anemia symptoms among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

48.7% of respondents didn't know about eclampsia, 48.4% answered high blood pressure, protein in urine with body edema and seizures, 1.6% answered peripheral neuropathy and 1.3% answered fatigability with abdominal pain. The table 5 below explains the results.

Eclampsia	Frequency	Percent (100%)
High blood pressure, protein in urine with body oedema and seizures	186	48.4
Fatigability with abdominal pain	5	1.3
Peripheral neuropathy	6	1.6
I don't know	187	48.7
Total	384	100

Table 5: *Distribution of knowledge about eclampsia among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

3.1% of pregnant women answered that red and white meats were useful to avoid constipation, 84.9% for Enough amount of fluids, vegetables and fruits and 12% didn't know the answer. The table 6 below shows the results.

Constipation during pregnancy	Frequency	Percent (100%)
Red and white meats	12	3.1
Enough amount of fluids, vegetables and fruits	326	84.9
I don't know	46	12.0
Total	384	100

Table 6: *Distribution of knowledge about constipation during pregnancy among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

70.6% of respondents didn't know about the effect of gum and teeth diseases on pregnancy, 27.1% answered "preventing you from eating and drinking", 4.4% answered "cause miscarriage" and 2.3% answered "cause early labour". The table 7 below describes the results.

Effect of gum and teeth diseases on pregnancy	Frequency	Percent (100%)
Preventing you from eating and drinking	104	27.1
Cause early labour	9	2.3
Cause miscarriage	17	4.4
I don't know	271	70.6
Total	384	100

Table 7: *Distribution of knowledge about the effects of gum and teeth disease among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

91.9% of women answered that doctors and nurses were their source of information about pregnancy, 71.9% for mother, 46.9% for sisters and friends and 18.2% for media. The table 8 shows the results.

Source of information during pregnancy	Frequency	Percent (100%)
Your mother	276	71.9
Your sisters and friends	180	46.9
media	70	18.2
Doctors and nurses	353	91.9
Total	384	100

Table 8: *Distribution of knowledge about the source of information during pregnancy among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

The attitude of women about their health care during pregnancy; 61.7% of respondents had an average attitude, 32% had good attitude and 6.3% had poor attitude towards health care during their pregnancy.

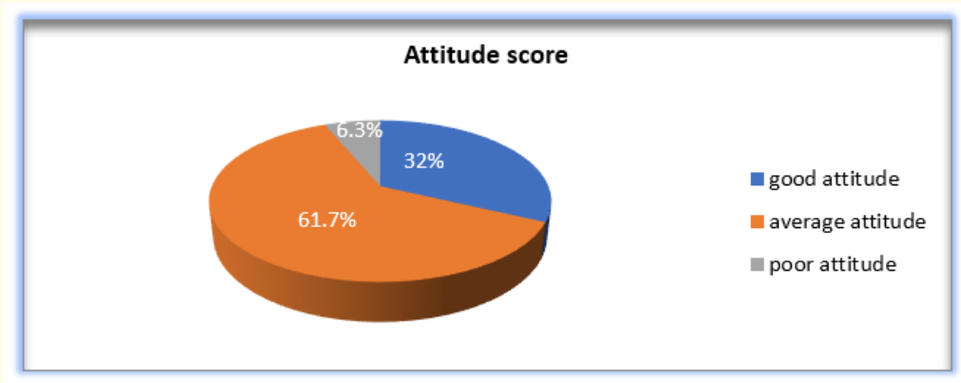

Figure 2: *Distribution of attitude about health care during pregnancy among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

Pregnant women had positive attitude towards the harmful effect of sleeping on back during the last months (85.2%), using excessive heat during the first trimester (72.1%) and using whitening creams (94.3%). 69.5% of women had positive attitude towards the useful effect of exercise during pregnancy. The table 9 below shows the results.

Lifestyles	Frequency	Percent (100%)
Sleep on back during the last months is harmful for pregnancy	327	85.2
Using excessive heat during the first trimester of pregnancy is harmful for you and your new born	277	72.1
Whitening creams can cause harm for you and your new born	362	94.3
Exercise during pregnancy is useful for labour	267	69.5

Table 9: *Distribution of attitude toward lifestyle among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

44% of pregnant women answered that gaining weight during and after pregnancy can cause health problems to the newborns, 11.2% chose gaining weight is good for her newborn health, 33.3% chose gaining weight can cause gestational diabetes and 32.8% agreed that gaining weight can cause change in body shape and obesity. Regarding losing weight,43% of women answered that losing weight during and after pregnancy can cause problems to their health, 38.8% chose losing weight can harm her newborn and cause low birth weight, 31.8% agreed that losing weight can cause complication during pregnancy and 10.9% agreed that losing weight is better for her health. The following table 10 describes the results.

Gaining and losing weight	Frequency	Percent (100%)
Gaining weight during and after pregnancy is good for your new born health	43	11.2
Gaining weight during and after pregnancy can cause health problems to the new born	169	44
Gaining weight during and after pregnancy can affect your health and cause gestational diabetes	128	33.3
Gaining weight during and after pregnancy can cause change in the body shape and obesity	126	32.8
Losing weight during and after pregnancy can harm your new born and cause low birth weight	149	38.8
Losing weight during and after pregnancy can cause complication during labour	122	31.8
Losing weight during and after pregnancy can cause problems for your health	165	43
Losing weight during and after pregnancy is better for your health	42	10.9

Table 10: *Distribution of attitude toward gaining and losing weight among pregnant women in Omdurman Maternity Hospital of Khartoum State, Sudan in 2019 (n = 384).*

68.5% of participants had positive attitude toward the effect of endogamy on their health and their newborn while 31.5% had negative attitude. The figure 3 below shows the result.

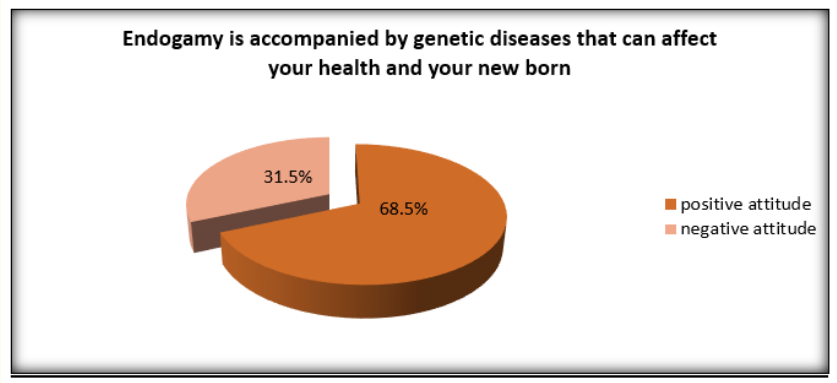

Figure 3: *Distribution of attitude toward endogamy among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

Regarding the practice of women about health care during pregnancy; 75.3% of participants had an average practice, 23.4% had good practice and 1.3% had poor practice. The figure 4 below explains the results.

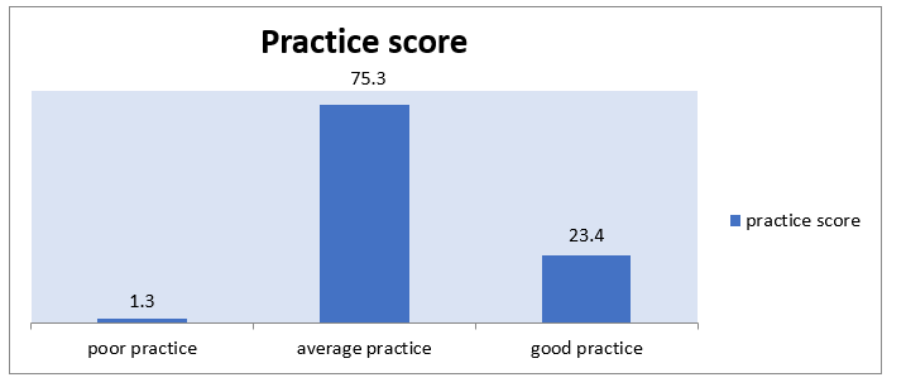

Figure 4: *Bar chart demonstrating the percentage of the practice score among pregnant women included in the study in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

13.5% of women was taking folic acid supplement before pregnancy. 4.4% was taking medication without doctor prescription. The table 11 below describes the results.

Taking medication	Frequency	Percent (100%)
Taking folic acid supplement before pregnancy	52	13.5
Taking medication without doctor prescription	17	4.4

Table 11: *Distribution of practice regarding taking medication among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

Participants reported exercising during their pregnancy, sleep on back during last month's, using excessive heat during first months and using whitening creams with 25%, 17.7%, 24.5%, 7.5% respectively. The results are described below.

Lifestyles	Frequency	Percent (100%)
Doing some exercise during pregnancy	96	25
Sleep on back during the last months of pregnancy	68	17.7
Use excessive heat during first months of pregnancy	94	24.5
Using whitening creams	29	7.5

Table 12: *Distribution of practice regarding lifestyles among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019(n = 384).*

Regarding breast care during pregnancy,88.3% maintaining their breast cleanness and 32.5% doing massage for nipples in the last months. The results are described below.

Breast care	Frequency	Percent (100%)
Maintaining your breast cleanness	339	88.3
Massaging nipples in the last months	125	32.5

Table 13: *Distribution of practice regarding breast care among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

73.7% of women visited the obstetrician or the health care center in the first trimester, 24.7% in the second trimester and 1.6% in the third trimester. The table 14 below shows the results.

Your first visit to the obstetrician or the health care center	Frequency	Percent (100%)
First trimester	283	73.7
Second trimester	95	24.7
Third trimester	6	1.6

Table 14: *Distribution of practice regarding the first antenatal visit among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

59% of respondents didn't eat nonfood items, 24% ate mud, 25.8 ate ice and 0.2% ate pottery. The table 15 below describes the results.

Eating non-food items	Frequency	Percent (100%)
Ice	99	25.8
Mud	92	24
Pottery	1	0.2
Don't eat anything	225	59

Table 15: *Distribution of practice regarding eating non-food items among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan in 2019 (n = 384).*

The parity status	Level of Knowledge			Total
	Poor Knowledge	Average Knowledge	High Knowledge	
Nulliparous	39	77	7	123
Multiparous	72	172	17	261
Total	111	249	24	384

Table 16: *The association between the knowledge of health care and the parity status of pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in 2019.*
There was no association between the knowledge and parity status (P-value = 0.7).

The parity status	Score of Attitude			Total
	Poor Attitude	Average Attitude	Good Attitude	
Nulliparous	10	77	36	123
Multiparous	14	160	87	261
Total	24	237	123	384

Table 17: *The association between the attitude toward health care and the parity status of pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in 2019.*
There was no association between the attitude and parity status (P-value=0.5).

The parity status	Level of Practice			Total
	Poor Practice	Average Practice	Good Practice	
Nulliparous	3	94	26	123
Multiparous	2	195	64	261
Total	5	289	90	384

Table 18: *The association between the practice of health care and the parity status of pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in 2019.*
There was no association between the practice and parity status (P-value = 0.4).

The educational level	Level of Knowledge			Total
	Poor Knowledge	Average Knowledge	Excellent Knowledge	
Illiterate	10	8	0	18
Primary	39	74	9	122
Middle	3	11	0	14
Secondary	35	87	4	126
University	21	49	7	77
Above university	3	20	4	27
Total	111	249	24	384

Table 19: *The association between the knowledge of health care and the educational level of pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in2019.*

There was association between the knowledge and educational level (P-value = 0.02).

The educational level	Score of Attitude			Total
	Poor Attitude	Average Attitude	Good Attitude	
Illiterate	9	5	4	18
Primary	7	78	37	122
Middle	0	11	3	14
Secondary	4	82	40	126
University	4	48	25	77
Above university	0	13	14	27
Total	24	237	123	384

Table 20: *The association between the attitude toward health care and the educational level of pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in 2019.*

There was association between the attitude and educational level (P-value = 0.001).

The educational level	level of practice			Total
	Poor Practice	Average Practice	Good Practice	
Illiterate	1	14	3	18
Primary	0	98	24	122
Middle	0	8	6	14
Secondary	3	94	29	126
University	1	53	23	77
Above university	0	22	5	27
Total	5	289	90	384

Table 21: *The association between the practice of health care and the educational level of pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in 2019.*

There was no association between the practice and educational level (P-value = 0.2).

Level of Knowledge	Score of Attitude			Total
	Poor Attitude	Average Attitude	Good Attitude	
Poor Knowledge	14	75	22	111
Average Knowledge	10	154	85	249
Excellent Knowledge	0	8	16	24
Total	24	237	123	384

Table 22: *The relation between the knowledge and the attitude of health care among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in 2019.*

The was association between the knowledge and attitude of health care (P-value = 0.001).

Level of Practice	Score of Attitude			Total
	Poor Attitude	Average Attitude	Good Attitude	
Poor Practice	2	2	1	5
Average Practice	22	175	92	289
Good Practice	0	60	30	90
Total	24	237	123	384

Table 23: *The relation between the practice and the attitude of health care among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in 2019.*

The was association between the practice and attitude of health care (P-value = 0.002).

Level of Knowledge	Level of Practice			Total
	Poor Practice	Average Practice	Good Practice	
Poor Knowledge	0	79	32	111
Average Knowledge	4	195	50	249
Excellent Knowledge	1	15	8	24
Total	5	289	90	384

Table 24: *The relation between the knowledge and the practice of health care among pregnant women in Omdurman maternity hospital of Khartoum state, Sudan, in2019.*

There was no association between the knowledge and practice of health care (P-value = 0.07).

Discussion

This study was a facility based descriptive cross-sectional study. It was conducted to assess the knowledge, attitude and practice of health care during pregnancy among pregnant women in Omdurman Maternity Hospital of Khartoum State, Sudan. The majority of women were young between 20 and 30 years because in Sudan, most of the women were married at an early age and this is important for family planning programs.

Regarding the educational levels, most of participants had only secondary school education and this is reflected in their knowledge, attitude and practice scores, this can be due to their age as we have already found that most of them were young. Some women had lower educational level and this can be attributed to their residence area and socioeconomic status.

In this study, over three quarters of pregnant women who attended the hospital were in their third trimester in order to prepare for delivery. On the other hand, few percentage of women were in their first and second trimester and this goes with the need to increase antenatal visits towards delivery. This is contrary to what was found in a study conducted in Kassala in which they found that (59.6%, 37.4% and 3.1%) of women attended the center in the first, second and third trimester, respectively [9].

Regarding the parity status, most of the women were multiparous and the majority of them had more than one child, so they had more experience toward pregnancy and antenatal care. Additionally, few percentage of women were nulliparous.

Most of the women were able to identify symptoms associated with pregnancy especially nausea and vomiting, tiredness and fatigability and missed period, this reflects their ability to suspect if they were pregnant or not.

There was a lack of information about rubella infection during pregnancy among most women. In comparison to another study done in Australia, they found that more than half (59%) of the women correctly identified the effect of rubella infection in pregnancy [10], which was better than the finding in our study, and this can be attributed to the educational level or incompetence of counseling or education by health care providers.

More than half of the participants didn't know about symptoms of anemia during pregnancy which represents a great danger to their health and their pregnancies because anemia is a global public health problem affecting two billion people worldwide particularly pregnant women [11]. Near to three fourth (72%) of the women in a study done in Ethiopia didn't know about anemia [12]. This similarity between our study and the previous one can be due to low educational level and socioeconomic status among participants or low quality of counseling.

Most of the women included in the study didn't know about eclampsia. On the other hand, a study done in Utah revealed that over half of reported women described the symptoms and signs of eclampsia [13], which is better than our results and the reason for this discrepancy can be due to the variation in the socioeconomic status and educational levels.

The majority of pregnant women knew that they should eat vegetables and fruits with enough amount of fluids when they had constipation and this is can be due to experience in how to deal with a constipation throughout life. Few percentage of women chose red and white meats which are bad for constipation and they make it worse. Also, there was small group of women didn't know the answer which contributed to the poor percentage of knowledge.

Three studies done about dental care, the first one at King Khalid hospital, Saudi Arabia [14], the second one in Brune [15] and the third one in Jerusalem, Palestine [16], they all showed that the knowledge of women about dental care was poor. Not surprising then, the majority of pregnant women in our study didn't know the effect of dental care on pregnancy. This similarity can be attributed to inexperienced health care providers and defects in dental unit as a part of the health care center.

In this study, almost all the women answered doctors and nurses as their main source of information during pregnancy which may explain their average knowledge score.

Almost all the pregnant women agreed about the harmful effects of using excessive heat during the first trimester of pregnancy, using skin bleaching creams and sleeping on back during the last months. On the other hand, few percentage of women showed negative attitude toward these harmful effects and the reasons for these variation in results can be also due to socioeconomic differences and cultural beliefs.

Most of the respondents had positive attitude toward gaining and losing weight during and after pregnancy, this stems from mothers' fear of harming their babies, so they tend to avoid any harmful behaviors. One of the studies done in Rochester about women's belief of

weight gain in pregnancy, they found that many women focused on the effects of insufficient pregnancy weight gain on the infant but were not aware of the infant risks of excessive gain, one third believed women will weigh more following pregnancy [17].

Consanguinity poses significant problems for proneness to abortion and the development of genetically flawed offspring. Most of the respondents agreed that endogamy is accompanied by genetic diseases that can affect their health and their new-borns, but more than one fourth of them didn't agree with that.

In this study almost all the women didn't take folic acid before their pregnancies. There was no variation in women taking folic acid before pregnancy, between our study and another study done in Australia, they found that (13%) had increased their folate intake before pregnancy [10], this is due to the fact that most pregnancies in Sudan are unplanned, therefore the first contact with the health care providers is usually after pregnancy has already occurred.

The majority of respondents didn't take medication without doctor prescription, this can be due to their knowledge about the danger effect of these drugs on the baby.

Most of the pregnant women believed that doing exercise is useful for labor, but only one fourth of the respondents reported exercising during pregnancy. This is similar to results of other studies, in Sao Paulo, Brazil (20%) [18] and Saudi Arabia (8%) [14].

In this study, few percentage of women used excessive heat and whitening creams during their pregnancies. Also, few of them slept on their back during the last months of pregnancy, taken into account that most women were multiparous, these results can be explained by their previous experiences.

Regarding the breast care, almost all the participants tended to maintain their breast cleanness as it is a part of their hygiene, whereas few of women did massage for their nipples during the last months because of the pain and sores that are found in the nipple especially in the third trimester.

Near to one fourth of respondents ate mud as one of the non-food items and this is somewhat similar to a study done in America in which they found that 38% of pregnant women practiced pica [19] and this can be due to social or psychological factors.

In this study, there was no association between the parity status and the knowledge, attitude and practice of health care among pregnant women, this means that there was no variation between the nulliparous and multiparous women regarding their health care during pregnancy. Multiparous women usually depend on their previous experiences but nulliparous women take their information from the media.

Maternal educational level was significantly associated with their knowledge and attitude regarding their health care during pregnancy, but there was no association with their practice. There are number of explanations for why education is a key determinant of their knowledge and attitude. One of them, is that higher educational level increases the ability of women to comprehend information and guidelines provided by their health care providers. Also, education is likely to enhance female autonomy: women thereby develop greater confidence and capabilities to make decision regarding their own health as well as their children. The majority of women were multiparous and they had cumulative experiences with each pregnancy besides their fear of harming their babies, so they tend to avoid any harmful practices.

In this study, the majority of participants had average knowledge, attitude and practice regarding their health care during pregnancy. There was association between the knowledge of health care during pregnancy and the attitude; this can be due to the fact that the majority of respondents had good level of education which is reflected in their knowledge and the latter one determines the process of think-

ing which is reflected in their attitude toward health care during pregnancy. On the other hand, there was no association between the knowledge of heath care and the practice among the participants and this is because most of the women were multiparous with enough experience about their health care during their pregnancies.

Conclusion

In this study most of the pregnant women had an average and poor knowledge about their health care regarding rubella, anemia, eclampsia and the harmful effect of dental diseases, which needs to be improved. The majority of women had an average and poor attitude toward their health care regarding exercise and the concept of endogamy and its impact on the health of the newborns, which requires behavioral modification. Most of the respondents had an average and poor practice regarding their exercise during pregnancy, folic acid intake before pregnancy, doing massage for their nipples as a part of breast care and avoid eating non-food items, which also needs to be improved. The study also made clear that nulliparous and multiparous women have the same level of knowledge, attitude and practice of Health care during pregnancy. The study highlights the educational level as it plays an important factor in the knowledge and attitude of pregnant women. The study also made clear that the practice of most women is better than their knowledge and attitude toward their health care during pregnancy.

Counseling in the antenatal care center should be improved regarding Knowledge about rubella, anemia, eclampsia and the harmful effect of dental diseases. Media and counseling in the antenatal care centers should aim to improve the attitude of pregnant women toward exercise and the concept of endogamy through behavioral modification. More advices should be included in the antenatal care counseling for the pregnant women during their antenatal visits regarding folic acid intake before pregnancy, doing massage for nipples as a part of breast care, avoid eating non-food items and doing exercise. Facilitated discussion and dialogue should be arranged between nulliparous women and multiparous women regarding their health care during pregnancy. Integrating antenatal care in school education especially in areas where there is high adolescence and teenager marriage. Engagement of girls in childbearing age through facilitated discussion with health care providers about the importance of the antenatal care, is highly recommended. More focus should be done on the knowledge and attitude of pregnant women toward their health care through health intervention programs and further research was recommended to identify factors which are associated with the knowledge and attitude. Workshops, campaigns and organization like neighborhood committee should empower women in childbearing age in community, to influence their communities and to correct misconception, and improve the quality of antenatal care. Media and other communication channels can serve as a forum to disseminate information about antenatal care.

Further research is needed throughout Sudan to assess the knowledge, attitude and practice of health care during pregnancy, also focus group discussions are recommended.

Study Limitation

The only limitation was found to be that few numbers of the pregnant women weren't cooperative during data collection as most of them where in their last months of pregnancy and this explains their lack of response.

Acknowledgements

I would like to thank my family with sincere gratitude for their unconditional support. Also, special thanks go to dr. Rayan, dr. Suad mohammed and dr. Suhair Satti.

Conflict of Interest

There was no any conflict of interest.

Bibliography

1. About Pregnancy (2018).
2. Wylie L. "Essential anatomy and physiology in maternity care". 2nd edition. Edinburgh: Elsevier, Churchill Livingstone (2005).
3. Shehan C. "The Wiley Blackwell Encyclopedia of Family Studies. UKI (2016).
4. Polin R., *et al.* "Fetal and neonatal physiology". 4th edition. Philadelphia: Elsevier Saunders (2011).
5. Collins S., *et al.* "Oxford handbook of obstetrics and gynaecology". 3rd edition. Oxford: OUP Oxford (2013).
6. Olana R and Lamaro T. "Assessment of Antenatal Care Utilization among Reproductive Age Group Women of Mizan-Aman Town, Southwest Ethiopia". *Primary Healthcare: Open Access* 06.01 (2016).
7. Maternal health. World Health Organization (2018).
8. About Pregnancy (2018).
9. Ali A., *et al.* "Use of antenatal care services in Kassala, eastern Sudan". *BMC Pregnancy and Childbirth* 10.1 (2010).
10. Marsack C., *et al.* "Pre-pregnancy counselling for the primary prevention of birth defects: rubella vaccination and folate intake". *Medical Journal of Australia* 162.9 (1995): 403-406.
11. De Benoist B., *et al.* "Worldwide prevalence of anaemia 1993–2005 WHO Global Data Base on Anaemia (2019).
12. Gebremedhin S., *et al.* "Coverage, compliance and factors associated with utilization of iron supplementation during pregnancy in eight rural districts of Ethiopia: a cross-sectional study". *BMC Public Health* 14.1 (2014).
13. PM] Wilkinson J and Cole G. "Preeclampsia knowledge among women in Utah". *Hypertension in Pregnancy* 37.1 (2017): 18-24.
14. Talal Jamil Hashim. "Pregnancy Experience, Knowledge of Pregnancy, Childbirth and Infant Care and Sources of Information among Obstetric Patients at King Khalid Hospital, Riyadh". *Journal of the Royal Society of Health* 114.5 (1994): 240-244.
15. Bamanikar S and Kee L. "Knowledge, Attitude and Practice of Oral and Dental Healthcare in Pregnant Women". *Oman Medical Journal* 28.4 (2013): 288-291.
16. Kateeb E and Momany E. "Dental caries experience and associated risk indicators among Palestinian pregnant women in the Jerusalem area: a cross-sectional study". *BMC Oral Health* 18.1 (2018).
17. Groth S and Kearney M. "Diverse Women's Beliefs About Weight Gain in Pregnancy". *Journal of Midwifery and Women's Health* 54.6 (2009): 452-457.
18. Ribeiro C and Milanez H. "Knowledge, attitude and practice of women in Campinas, São Paulo, Brazil with respect to physical exercise in pregnancy: a descriptive study". *Reproductive Health* 8.1 (2011).
19. Corbett R., *et al.* "Pica in Pregnancy: Does It Affect Pregnancy Outcomes?". *MCN, The American Journal of Maternal/Child Nursing* 28.3 (2003): 183-189.

Volume 10 Issue 11 November 2021