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Full-Length Research Article

Assessment of Knowledge and Associated Factors towards Congenital Anomalies among Pregnant Women Visiting Antenatal Care Clinic at Arba Minch General Hospital, Gamo Zone, Southern Ethiopia

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ABSTRACT

Knowledge of Congenital anomalies (CAs) among the public, especially reproductive age women have a significant role in reducing the incidence. However, there is a dearth of studies conducted on this issue in our country. This study was aimed to assess the pregnant women's knowledge of CAs at the antenatal care clinic of Arba Minch General Hospital. Institution based cross-sectional study was conducted between December 2017 and September 2018. Semi-structured questionnaire was used to collect the data. Data were cleaned, entered and analysed by using SPSS version- 20 software packages. Besides descriptive statistics, Bi-variate and Multi-variate logistic regression analyses were done to explore the predictors of women's level of knowledge toward CAs. P-value < 0.05 was considered as statistically significant. A total of 392 pregnant women had participated in the present study. From total respondents, only 11.0% of the pregnant women have known that many of CAs are of genetic origin, and a significant proportion of the women had believed that CA is a disease acquired by pregnant women (39.0%), and it occurs in a baby due to the sin of families (48.5%). Only 189 (48.2%) women had adequate overall knowledge about CAs. The participants had good knowledge of the risk factors than their specific knowledge of CAs. The level of education and occupation were significantly associated (P<0.05) with the women's overall knowledge of CAs. In conclusion, the women's knowledge of CAs in this study was found less. Appropriate strategies should be designed and implemented to improve women's knowledge of congenital anomalies.

Keywords: antenatal care, congenital anomalies, Arba Minch, Gamo zone

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1. INTRODUCTION

Congenital anomalies (CAs) are also known as birth defects (BDs), congenital disorders, or congenital malformations. Congenital anomalies are defined as a structural and functional disorders that may be detected during pregnancy or be visible at birth or later in infancy (WHO, 2016). CAs are the major cause of newborn/infant morbidity, mortality, and disability in addition to adding to the burden of the health care system (Galina and Tatiana, 2018). As per the report of Taye et al., (2019), the prevalence of congenital anomalies is nearly 2% in central and northwest Ethiopia.

Although most of the causes of congenital anomalies are still unknown, environmental teratogens, micronutrient deficiencies, chromosomal disorders, single gene defects, and multifactorial inheritance are thought to be the cause of congenital anomalies (Postoev *et al*., 2015). Some CAs can be prevented through vaccination, adequate intake of folic acid or iodine through fortification of staple foods or supplementation, and adequate antenatal care (WHO, 2016).

A significant proportion of women are not practising preventive behaviours in Ethiopia. A nationwide cross-sectional study done in Ethiopia revealed that only 1.92% of pregnant women took the folic acid supplement at a protective period against neural tube defects (NTDs) and 11.6% of pregnant women started in the first trimester of pregnancy (Dessie*et al*., 2017). A related nationwide study conducted in Ethiopia showed that 46% of women who participated in the study had severe folate deficiency (Haidar *et al*., 2010). Another study done in Adet, Northwestern Ethiopia has reported that only 15.9% of the women who participated in the study had good awareness of preconception folic acid supplementation (Goshu*et al*., 2018).

The more the women become knowledgeable of CAs, the higher the chances to reduce the Incidence and mortality due to CAs. Mothers who have higher knowledge of risk factors of CAs and management options of the affected individuals would have higher chances to prevent and would minimize the extreme outcome of CAs (Owotade *et al*., 2014). Though, congenital anomalies are among the leading cause of neonatal mortality in Ethiopia accounting for about 11% (HNN, 2017), women's knowledge of congenital anomalies in Ethiopia has not been studied yet. Moreover, articles done in different areas revealed that women's knowledge of CAs is generally inadequate (Masoumeh *et al*., 2015; Kanchana and Youhasan, 2018; Ogamba *et al*., 2021; Silva *et al*., 2019). Hence, this study was aimed at assessing pregnant women's knowledge and associated factors toward congenital anomalies in Arba Minch General Hospital, Gamo Zone, Ethiopia.

2. MATERIALS AND METHODS

The study was conducted at ANC clinic in Arba Minch General Hospital between December 2017 and September 2018. Arba Minch General Hospital is the largest and oldest hospital in Gamo zone and it serves people residing in Arba Minch town and

other urban and rural parts of the zone. Arba Minch is the zonal town of Gamo zone, Southern Nations, Nationalities, and Peoples Region (SNNPR), Ethiopia. The town is located about 500 kilometres south of Addis Ababa, at an elevation of 1285 meters above sea level. According to the 2007 Census conducted by the CSA, this town has a total population of 74,879, of whom 39,208 are men and 35,671 women.

Institution based cross-sectional study design was employed. Health care professionals and severely ill pregnant women were excluded from the study. The sample size was determined by using the single population proportion formula with the assumption of the proportion of pregnant women having moderate knowledge on CAs 48.1% from a previous study conducted in Ghana (Bello *et al*., 2013) and adding a 10% non-response rate. Accordingly, we obtained a calculated sample size is 422, of then 30 participants were unable to provide adequate information and were excluded from the study. A total of 392 systematically sampled pregnant women who visited the ANC clinic of Arba Minch General Hospital between December 2017 and September 2018 were participated in this study. A pretested, interviewer administered semi-structured questionnaire was used to collect the data. The questionnaire was prepared first in English through a review of related published articles and then translated into Amharic by expertise. Its reliability and validity were tested on 5% of the sample at Sikela Health Center. The questionnaire had three logical sections, namely; socio-demographic and obstetric related characteristics, questions to assess the specific knowledge of women toward CAs, and questions to assess the knowledge of women on the risk factors and prevention of CAs (Annexed).

A total of 21 closed-ended questions were used. The maximum total score was 21 (9 points for specific knowledge plus 12 points for knowledge of the risk factors and prevention). Each correct response was given a 1 mark and a wrong or "I do not know" response was given 0 marks. Scores in the knowledge domain were categorized into two: below the average (Not knowledgeable), and above the average (knowledgeable). Public health nurses and midwives working in the clinic and who speak Amharic and other local languages were recruited for the data collection. They collected data after obtaining training provided by the principal investigator.

Data analysis

Data were cleaned, coded and entered into Statistical Package for Social Sciences (SPSS) version-20 software packages and analyzed. Descriptive summaries were presented in terms of frequencies and percentages. Bi-variate and Multi-variate logistic regression analyses were done to explore the predictors of women’s level of knowledge toward CAs. In multivariate analysis a p-value < 0.05 was considered statistically significant.

3. RESULTS

3.1 Socio-demographic characteristics of the study participants

Of the 422 pregnant women interviewed, 392 (92.9%) participants provided adequate information and were used in these analyses. A great majority of the participants 335 (85.5%) were urban residents. 75.8% of women were within the age group of 21-30 years. Nearly half of the study participants 192 (49.0%) were Orthodox Christians followed by Protestant Christians 173 (44.1%). Most women 140 (35.7%) have attended a higher level of education at a university or college while 124 (31.6%) have attended secondary level. 178 (45.4%) of the women were housewives (Table 1).

Table1: Socio-demographic characteristics of pregnant women who visited ANC clinic of Arba Minch General Hospital, Southern Ethiopia, 2017/18.

Variables	Categories	Frequency	%
Residence	1 Urban	335	85.5%
	2 Rural	57	14.5%
Age Category	1 <20	43	11.2%
	2 21-30	291	75.8%
	3 31-40	50	13.0%
Level of education	1 Not educated	39	9.9%
	2 Primary level	89	22.7%
	3 Secondary level	124	31.6%
	4 Higher level	140	35.7%
Occupation	1 Farmer	14	3.6%
	2 Merchant	78	19.9%
	3 Housewife	178	45.4%
	4 Government employee	98	25.0%
	5 student	24	6.1%
Religion	1 Orthodox Christian	192	49.0%
	2 Muslim	27	6.9%
	3 Protestant	173	44.1%
	4 Other	0	0.0%

Obstetric related characteristics of the respondents

The majority of the women who participated in the present study 273 (69.6%) have given less than two births previously. More than 85% (334) of the women had no poor obstetric history. 63% of the women had commenced ANC follow up previously. Only 2 (0.5%) of participant women had a history of birth defect in their previous baby while none of the participants had a history of birth defect within their relatives(Table 2).

Table 2: Obstetric related characteristics of pregnant women visited ANC clinic of Arba Minch General Hospital, Southern Ethiopia, 2017/18.

Variables	Categories	Frequency	Percent (%)
Number of Births given previously	1 <2	273	69.6%
	2 >/=2	119	30.4%
Family Size	0 three or less	219	55.9%
	1 four or more	173	44.1%
Poor Obstetric History	0 No	334	85.2%
	1 Yes	58	14.8%
ANC follow-up status	1 Yes	247	63.0%
	2 No	145	37.0%
Birth defect history in own previous baby	1 Yes	2	0.5%
	2 No	390	99.5%
Birth defect history within relatives	1 Yes	0	0.0%
	2 No	392	100.0%

Pregnant women's Specific Knowledge on congenital anomalies

From total respondents, only 11.0% of the pregnant women have known that many of the CAs are of genetic origin, and 116 (29.6%) of women answered that birth defects can be acquired by a baby developing in the womb. More than half of the women answered that most birth defects are preventable and most of the defects can be treated or managed medically, however, only 32% of them have known that deformities from congenital malformation can be reduced through physiotherapy. The majority of the women who participated in the present study have known that a birth defect is not of supernatural origin (52.8%) or can be transmitted by contact with an affected individual (62.5%). However, a significant proportion of the women had believed that birth defect (BD) is a disease acquired by pregnant women (39.0%), and it occurs in the baby due to the sin of families (48.5%) (Table 3).

Table 3: Pregnant women's specific knowledge on birth defect (BD) at ANC clinic of Arba Minch General Hospital, Southern Ethiopia, 2017/18.

Variables	Response	Frequency	%
BD is a disease acquired by pregnant women	Yes	71	18.1
	No	153	39.0
	I do not know	168	42.9
BD is of supernatural origin	Yes	47	12.0
	No	207	52.8
	I do not know	138	35.2
BDs can be acquired by a baby developing in the womb	Yes	116	29.6
	No	70	17.9
	I do not know	206	52.6
	Yes	20	5.1

Variables	Response	Frequency	%
BDs can be transmitted by contact with an affected individuals	No	245	62.5
	I do not know	127	32.4
Most birth defects are preventable	Yes	202	51.5
	No	42	10.7
	I do not know	148	37.8
Most birth defects can be treated or managed medically	Yes	210	53.6
	No	28	7.1
	I do not know	154	39.3
Deformities from congenital malformation can be reduced through physiotherapy	Yes	126	32.1
	No	46	11.7
	I do not know	220	56.1
Many of BDs are of genetic origin	Yes	43	11.0
	No	67	17.1
	I do not know	282	71.9
BD occurs in the baby due to the sin of families	Yes	35	8.9
	No	190	48.5
	I do not know	167	42.6

Pregnant women's knowledge of the risk factors of CAs and prevention

More than nearly two-third of the women have correctly answered that alcohol consumption during pregnancy, the use of some unprescribed medications, and smoking before and during pregnancy increase the risk of giving birth to a child with CAs. However, only about 28% of women have known that an advanced maternal age (≥40 years) increases the risk of giving birth to a child with a birth defect (BD). Similarly, the great majority of women know that regular ANC follow-up throughout the pregnancy period, consumption of iodinated salt during pregnancy, and consumption of folic acid/iron folate during pregnancy reduce the chance of giving birth to a child with BD. About one-third of women have the awareness that obesity, uncontrolled diabetes of a mother, and exposure to radiation (X-ray) during pregnancy are some of the risk factors of BDs. However, only a few of the women who participated in this study have known that a history of birth defect in one's own baby previously or within relatives, and consanguinity increases the risk of giving birth to a child with BD (Table 4).

Table 4:Pregnant women's knowledge on the risk factors of congenital anomalies and prevention at ANC clinic of Arba Minch General Hospital, Southern Ethiopia, 2017/18.

	Response	Frequency	Percent (%)
Will alcohol consumption during pregnancy increase your risk of giving birth to a child with BD?	Yes	252	64.3
	No	18	4.6
	I do not know	122	31.1
Will the use of some unprescribed medications increase your risk of giving birth to a child with BD?	Yes	256	65.3
	No	9	2.3
	I do not know	127	32.4

	Response	Frequency	Percent (%)
Will smoking before and during pregnancy increase your risk of giving birth to a child with BD?	Yes	269	68.6
	No	7	1.8
	I do not know	116	29.6
Will advance maternal age (≥40 years) increase the risk of giving birth to a child with BD?	Yes	110	28.1
	No	29	7.4
	I do not know	253	64.5
Will consumption of folic acid/iron follate during pregnancy reduce the chance of giving birth to a child with BD	Yes	262	66.8
	No	15	3.8
	I do not know	115	29.3
Will consumption of iodinated salt during pregnancy reduce the chance of giving birth to a child with BD	Yes	243	62.0
	No	4	1.0
	I do not know	145	37.0
Will regular ANC follow up throughout the pregnancy period reduce the chances of giving birth to a child with BD	Yes	282	71.9
	No	6	1.5
	I do not know	104	26.5
Will exposure to radiation (X-ray) during pregnancy increase the risk of giving birth to a child with BD	Yes	151	38.5
	No	19	4.8
	I do not know	222	56.6
Will obesity during pregnancy increase the risk of giving birth to a child with BD	Yes	120	30.6
	No	31	7.9
	I do not know	241	61.5
Will uncontrolled diabetes of a mother during pregnancy increase the risk of giving birth to a child with BD	Yes	135	34.4
	No	26	6.6
	I do not know	231	58.9
Will a history of birth defect in one's baby previously or relatives increase the risk of giving birth to a child with BD	Yes	62	15.8
	No	99	25.3
	I do not know	231	58.9
Will consanguinity increase the risk of giving birth to a child with BD	Yes	66	16.8
	No	140	35.7
	I do not know	186	47.4

Pregnant women's overall knowledge of congenital anomalies

The mean score value of pregnant women's knowledge about congenital anomalies was 9.42 out of 21. Among the participants, only 189 (48.2%) women have answered more than half of the questions correctly and had adequate knowledge about congenital anomalies.

Factors associated with the pregnant women's knowledge on congenital anomalies

Bi-variate and multivariate logistic regression analyses were done to assess the association between the selected predictor variables and knowledge towards congenital anomalies. The result of our binary logistic regression analysis has shown that residence, age, level of education, occupation, antenatal care follow-up status, and religion have an association with the overall

knowledge of participants (P<0.25). However, family size, number of births given before, birth defect history in one's previous baby, and poor obstetric history were not associated with the knowledge status of participants in the present study. During the adjusted binary logistic regression analysis, only two explanatory variables were significantly associated (P<0.05) with the overall knowledge of participants on congenital anomalies. These were; levels of education, and occupation (Table 5).

Table 5: Bi-variate and multivariate analysis of factors associated with women's knowledge onCAs at ANC clinic of Arba Minch General Hospital, Southern Ethiopia, 2017/18.

Variables	Categories	Not knowledgeable		Knowledgeable				
		n	n%	n	n %	COR(95% CI)	AOR(95% CI)	P-value
Residence	Urban	165	81.3%	170	89.9%	1	1	
	Rural	38	18.7%	19	10.1%	0.347 (0.180 - 0.668)	0.810 (0.362 - 1.812)	0.608
Age	<20	27	13.6%	16	8.6%	0.438 (0.181 - 1.059)	0.803 (0.275 - 2.342)	0.687
	21-30	149	74.9%	142	76.8%	1.028 (0.562 - 1.881)	0.810 (0.399 - 1.645)	0.560
	31-40	23	11.6%	27	14.6%	1	1	
Educational status	Not educated	31	15.3%	8	4.2%	0.084 (0.031 - 0.229)	0.044 (0.014 - 0.131)	0.000*
	Primary school	62	30.5%	27	14.3%	0.145 (0.078 - 0.270)	0.067 (0.029 - 0.158)	0.000*
	Secondary school	74	36.5%	50	26.5%	0.457 (0.279 - 0.749)	0.116 (0.054 - 0.249)	0.000*
	Higher education	36	17.7%	104	55.0%	1	1	
Occupation	Farmer	14	6.9%	0	0.0%	0.047 (0.006 - 0.371)	0.000 (0.000 –)	0.999
	Merchant	43	21.2%	35	18.5%	0.445 (0.242 - 0.816)	4.915 (1.459 - 16.562)	0.010*
	Government Employee	36	17.7%	62	32.8%	0.384 (0.231 - 0.638)	7.267 (2.230 - 23.679)	0.001*
	Housewife	94	46.3%	84	44.4%	3.444 (1.342 – 8.843)	2.438 (0.802 – 7.414)	0.116
	Students	16	7.9%	8	4.2%	1	1	
Religion	Orthodox Christian	94	46.3%	98	51.9%	1	1	
	Muslim	19	9.4%	8	4.2%	0.813 (0.358 - 1.842)	0.566 (0.222 - 1.447)	0.235
	Protestant	90	44.3%	83	43.9%	0.765 (0.505 - 1.161)	1.362 (0.810 - 2.291)	0.244
	Other	0	0.0%	0	0.0%	-	-	-
ANC follow-up	Yes	121	59.6%	126	66.7%	1	1	
	No	82	40.4%	63	33.3%	0.672 (0.441 - 1.023)	0.923 (0.541-1.573)	0.768

CI Confidence interval, COR crude odds ratio, AOR adjusted odds ratio *statistically significant (p <0.05), '1' reference category.

Pregnant women who are not educated, completed primary school , and completed secondary school were 0.014, 0.067, and 0.116 times more likely to be less knowledgeable about congenital anomalies compared to those who had attended college/university level of education [AOR= 0.044, 95% CI:(0.014 - 0.131)], [AOR= 0.067, 95% CI: (0.029 - 0.158)], and [AOR= 0.116, 95% CI: (0.054 - 0.249)], respectively.

As to our finding, merchants and government employees were 4.915 and7.267times more likely to be knowledgeable about congenital anomalies compared to those students [AOR=4.915, 95% CI: (1.459 -16.562)] and [AOR=7.267, 95% CI: (2.230 - 23.679)], respectively.

4. DISCUSSION

Awareness among reproductive age women toward congenital anomalies has a pivotal role in the prevention of the disease. As far as our search is concerned, this is the first study conducted to assess the women's knowledge of congenital anomalies in Ethiopia.

In this study, only 48.2% of respondents had adequate knowledge of congenital anomalies. This finding is in line with the studies done in North Iran, Ghana, South-West Nigeria, and Sri Lankan that reported a significant proportion of the participants had inadequate overall knowledge on congenital anomalies (Bello *et al*., 2013; Masoumeh et al., 2015; Kanchana and Youhasan, 2018; Ogamba et al., 2021; Silva et al., 2019). These studies have also informed that, though the specific knowledge on congenital anomalies was inadequate, the women's knowledge on the risk factors of congenital anomalies was moderate to high among the great major proportion of the respondents, which is in support of our finding.

56.1% of the participants were uninformed that deformities from congenital malformation can be reduced through physiotherapy, and 39.3% of the participants were not known that some deformities from CAs can be treated surgically. However, it has to be known that appropriate surgical interventions could be lifesaving or would reduce the severity of disability (March of Dime, 2006).

In line with our finding, several related studies have reported that those women attended or graduating from college/University level, and employees are more likely to have adequate knowledge of congenital anomalies (Masoumeh et al., 2015; Kanchana and Youhasan, 2018; Ogamba et al., 2021; Silva et al., 2019; Dahl *et al.*, 2011; Al-Jader *et al*., 2000). However, the present study is inconsistent with the finding of Bello et al., which did not find a significant relationship between the overall knowledge of the participants about congenital anomalies with educational level. This may be as a result of the possible difference in the practices of general public health education on CAs and providing adequate counselling services during ANC visits between nations.

About 63% of the pregnant women who participated in this study were commenced ANC clinic follow-up. Although frequent visits of pregnant women to antenatal care clinics during pregnancy play an important role in increasing the women's knowledge on congenital anomalies, the present finding did not showed a significant association between women's knowledge and the commencement of ANC visits. This may be due to inadequate counselling service in the clinic during their visits. This result is consistent with the report of Bello et al.

5. LIMITATIONS OF THE STUDY

This study was limited by employing a questionnaire; no assessment of knowledge metric by using a qualitative approach for possible triangulation was carried out.

6. CONCLUSION AND RECOMMENDATIONS

In this study, the adequate knowledge about congenital anomalies among pregnant women visiting ANC clinic at Arba Minch General Hospital was found less. Educational statuses and occupation were identified predictors of knowledge on congenital anomalies. Appropriate measures should be taken to improve women's knowledge of congenital anomalies. Some of the measures could be, adequate preconception counselling before pregnancy, at health centers and in general public.

Ethical approval and consent to participate

Arba Minch University, college of medicine, and health sciences' institutional research ethics review board ethically approved all the study methods and protocols. Informed verbal consent was taken from pregnant women before data collection.

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