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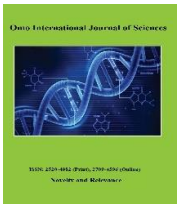

Research Article

Knowledge of antenatal exercise and its associated factors among pregnant women in Arba Minch Town, Southern Ethiopia

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Abstract

Antenatal exercise reduces many health-related risks in pregnant women and their fetuses. Adequate knowledge regarding antenatal exercise is vital to practice. However, knowledge of antenatal exercise has not been studied yet in the study area. Therefore, this study aimed to assess knowledge of antenatal exercise and its associated factors among pregnant women in Arba Minch town. Community based cross-sectional study design was conducted. Data were collected by using structured questionnaire from 422 pregnant women selected by simple random sampling technique. Sixteen questions with expected responses of "yes" or "no" were applied to examine knowledge. Descriptive statistics like mean, standard deviation, frequencies, and proportions were computed. In multivariable logistic-regression, AOR with 95% confidence intervals were computed. The significance level was declared at p-value < 0.05. Overall, 46% (95% CI, 41%-51%) of pregnant women had adequate knowledge of antenatal exercise. High school educational level [AOR= 2.45, (95%CI1.04-5.77)], monthly income < 1,347 Ethiopian birr [AOR=0.55,(95%CI 0.33-0.92)], unemployment [AOR=0.33,(95%CI 0.14-0.77)], gravida one [AOR=3.15,(95%CI 1.39-7.14)], gravida two to three [AOR=3.28,(95%CI 1.61-6.69)], four to three months of pregnancy [AOR=0.58, (95%CI 0.38-0.90)] and age < 25 years [AOR= 0.49, (95%CI 0.30-0.79)] were significantly associated with knowledge of antenatal exercise. Knowledge towards antenatal exercise in this setting found to be inadequate. Educational levels, income level, occupation status, gravidity, months of pregnancy and age were factors associated with antenatal exercise. Hence, interventions targeting to improve the income and employment status of pregnant women are recommended.

Keywords: Antenatal exercise; Arba Minch; Knowledge; Pregnant women

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1. Introduction

Physical activity is a bodily movement produced by the contraction of skeletal muscles in all stages of life while, exercise is a structured, planned and repetitive movement produced by skeletal muscles (Sharon, 2017). Exercise is a safe and effective way to gain many physical and mental health benefits including maintaining and improving cardiorespiratory fitness, reducing the risk of obesity and associated comorbidities, and resulting in greater longevity (Ribeiro and Milanez, 2011).

Appropriate antenatal exercise has proved to be beneficial to many expectant women, though how much and what kind of exercises varies from person to person and its regular participation of exercise has become an important component of a healthy lifestyle, so antenatal exercise has become a fundamental aspect of women's lives and an important constituent of antenatal care (AM, 2005; Lee *et al*., 2012; Pasanen *et a*l., 2017). Regular exercise is promoted for its overall health benefits. Modern popular culture has embraced the concept of a "fit pregnancy." Scientific findings support the contention that regular exercise during pregnancy incurs little risk and is beneficial, in terms of both mental and physical health (Nascimento *et a*l., 2014).

Studies show that low to moderate impact exercise regime for pregnant mothers performed for about 30 minutes on most days of the week and gradually progressed over a period of time can be followed to improve overall fitness. These exercises include aerobic exercises such as aerobics, swimming, cycling, walking, dancing; core stability, pelvic floor exercises, breathing exercises, postural education and back care (ACOG, 2017). Foot and leg exercises and pelvic tilting can be performed in sitting or half-lying positions, whereas trans versus and pelvic floor exercises can be carried out in any position (EJ, 2005).

Scientific literature shows that, in most cases, exercise is safe for both the mother and fetus during pregnancy and supports the recommendation of initiating continued specific exercise postures can help the pregnant woman to adapt to the physical changes in her body during childbearing in most pregnancies (ACOG, 2017). So American College of Obstetrics and Gynecology (ACOG) recommended that pregnant women can exercise moderately for 30 minutes on most days of the week. Following these recommendations, irrespective of the pregnant woman's physical fitness level, exercise should be low-impact, moderate- intensity, and regular (ACOG, 2017).

For healthy pregnant and postpartum women, at least 150 minutes per week a moderate intensity of aerobic exercise is recommended. Pregnant women who are regularly engaging in vigorous-intensity aerobic activity (i.e., the equivalent of running or jogging) or who are highly active can continue physical activity during pregnancy and their health care provider should better counsel how and when physical exercise will be done over time (Garland, 2017).

Numerous health benefits of antenatal exercise during pregnancy were documented such as the reduced risk of excessive gestational weight gain and conditions such as gestational diabetes, preeclampsia, preterm birth, varicose veins, deep vein thrombosis, and reduced length of labor and decrease delivery complications (Evenson et al., 2014). Psychological benefits of physical activity during pregnancy include reduced fatigue, stress, anxiety, and depression, as well as improved well-being (Evenson et al., 2014).

Furthermore, Antenatal exercise improves the functioning of the fetal and neonatal cardiac autonomic nervous system, normalizes birth weights, and reduces adiposity at birth and in early childhood (May et al., 2010). Additionally, babies born seem to be calmer, are leaner, more intelligent with improved neurological and mental development and their children had significantly higher scores on oral language and general intelligence tests (May et al., 2010).

Although antenatal exercise has a good health impact on pregnant women and their children, studies showed that there is inadequate knowledge of pregnant women towards antenatal exercise. In Saudi Arabia only 69.5% were knowledgeable (al Rahi, Al-Khaldi, Al-Awwad, Ahmed, & Al-Thubaiti, 2018). In Brazil 65.6% (Ribeiro and Milanez, 2011), in Sri lanka Colombo,72.7% were not knowledgeable (Herath et al., 2016), in Zambia 74% of pregnant women had inadequate knowledge (Nkhata, Munalula-Nkandu, & Shula), in Nigeria and Kenya majority of pregnant women had inadequate knowledge about antenatal exercises (Edinah et al., 2018; Chidozie E Mbada et al., 2014).

Globally, thousands of pregnant women suffer different problems and lose their lives daily due to non-involvement in exercise during pregnancy and other preventable, immeasurable pregnancy related complications (Al Rahi et al., 2018). Lack of physical activity in the general population and lack of antenatal exercise were taken as the leading risk factors for death estimating 3.2 million deaths worldwide and the fourth leading risk factor for early mortality worldwide (ACOG, 2017). It was reported that lack of antenatal exercise increased the prevalence of chronic diseases such as cardiovascular disease, type 2 diabetes, osteoporosis and cancer and their risk factors such as raised blood pressure, raised blood sugar and overweight

(Ainsworth et al., 2011) while practicing appropriate antenatal exercise decreases the risk of developing gestational diabetes mellitus, pre- eclampsia, caesarean section rate, reduced symptoms from low back pain and improved mental state (ACOG, 2017). The Worldwide maternal mortality ratio (MMR) is 216 per 100000 live births. Sub-Saharan Africa has a very high MMR 546, (WHO, 2015). Ethiopia is one of the sub-Saharan countries with a high maternal mortality ratio of 412 per 100000 lives (ICF, 2016).

Understanding the existing knowledge about antenatal exercises among pregnant women is valuable for designing an educational intervention to promote antenatal exercise. However, the knowledge status of pregnant women in Arba Minch town has not been studied. Hence this study was designed to assess the knowledge of antenatal exercise and associated factors among pregnant women in Arba Minch town, Southern Ethiopia.

2. Materials and Methods

2.1. Study design, period and setting

The community-based cross-sectional study design was conducted from December 1st to 30th, 2019 GC in Arba Minch town, Southern Ethiopia. Arba Minch town is located 454 Km to the South of Addis Ababa (capital city of Ethiopia) and about 280 Km from the regional city Hawassa. According to the 2007 census, the total population of the town was 74,879, of whom 39,208 are men and 35,671 women (Census, 2007). A total of 23.5% were found to be reproductive age group, among these, 4,084 women are currently pregnant. The numbers of health institutions in Arba Minch town are 1 governmental general hospital, 3 Health centers, 33 private clinics and 13 drug stores.

Populations

The sources populations were all pregnant women in Arba Minch town. All pregnant women who lived in Arba Minch town for at least six months were included. Pregnant women who had medical or obstetric complications and serious psychological conditions that could have an impact on the information were excluded.

2.2 Sample size determination and sampling Techniques

The sample size was determined by using single population proportion formula through Open Epi, Version 3, open-source considering the following assumptions: knowledgeable about antenatal exercise to be 50%, 95% confidence interval of certainty (alpha = 0.05), 5% marginal error, 10% non-response rate. The final sample size was determined as 422. There are four sub-cities in the town, which are divided into 11 Kebeles (small administrative unit of Ethiopia). The

sample size was allocated to all Kebeles proportional to their number of pregnant women sizes. Each pregnant woman was selected by computer generated number simple random sampling technique using a family folder sampling frame.

2.3 Study variables

Knowledge of antenatal exercise was a dependent variable, whereas socio-demographic characteristics like age, occupation, religion, monthly income, educational status, employment and marital status, obstetric characteristics like gravidity, gestational ages, parity, number of children, history of miscarriage, and information source were independent variables.

2.4 Operation definitions

Antenatal exercise is an appropriate and safe type of exercise which is planned and repetitively done by pregnant women to gain the benefits. These exercises are low-impact, moderate-intensity exercise such as walking, stationary cycling, water aerobics, stretching, yoga modified and swimming, pelvic floor exercise, relaxation or breathing exercise while high-impact forms of exercise such as strength training and running should not be performed (ACOG, 2017). Knowledge of antenatal exercise was measured by asking sixteen questions about the benefit and contraindication of antenatal exercise with categorical responses of “yes” and “no” with an item score of “1”, and “0” respectively. Then, the sum was computed and those who responded correctly for the mean and above value were considered as they had adequate knowledge and those who scored less than the mean value was labeled as they had inadequate knowledge about antenatal exercise.

2.5 Data collection instrument and data quality control

Data were collected using a pre-tested structured questionnaire by face-to-face interview which was divided into four parts. Socio-demographic data, Obstetrical histories, Source of antenatal exercise and knowledge of antenatal exercise. The questionnaire was designed in English from literatures on related topics (Mbada et al., 2014; Nkhata et al., 2015) and based on ACOG recommendations. The questionnaire was reviewed by experts and its contents were validated. The reliability test result of Crombach’s alpha was 0.921. Finally, the questionnaire was translated to Amharic for better understanding by data collectors and interviewees. A total of eight data collectors of 4 diploma nurses and 4 diploma midwives were involved in data collection and two supervisors. Before actual data collection, pretest was done on 5% women using the Amharic translated questions to check the clarity, to evaluate the tool, to determine

whether there is any need to do any modification. This was done at Mirab Abaya outside the main study area. Training was given to data collectors and a supervisor before the beginning of actual data collection. The supervisor closely followed the data collection process. The completed questioners from the data collectors were checked for completeness and consistency on daily bases.

2.6 Data analysis

The collected data was coded and entered into Epi Data version 4.6 then exported to SPSS version 25 for analysis. Descriptive statistics like frequencies, percentages, mean, standard deviations were computed. Binary logistic regression model was also used. Variables with a p value ≤ 0.25 level in the bivariate analysis were entered into multivariable analysis.in addition; the context and findings of previous studies were considered in the identification of candidate variables for multiple variable logistic- regressions to adjust for possible confounding variables. Adjusted odds ratio (AOR) with 95% confidence interval (CI) were used to measure the strength of associations and p value of < 0.05 was used to determine the presence of association with the outcome variable. Hosmer and Lemeshow model fitness test was used to assess model fitness and it was a good fit.

3. Results

3.1. Socio-demographic characteristics of study participants

Of the 422 women interviewed, 410 (97.20%) provided complete information on antenatal exercise and were used in these analyses. The mean ± SD (standard deviation) age of the participants was 25.82 ±5.16 years. The majority of women 233(56.80%) were within the age category of ≥ 25 years. More than half of the study participants 231 (56.30%) were protestant Christians. A majority of the participants 390 (95.10%) were married. Most women 176 (42.90%) attended up to primary schools while around 30% of their husbands attended their education in university or college. Concerning occupation 335 (81.70%) of the women were none employed. The mean monthly income of the study participants was 1,347 Ethiopian Birr (ETB). More than half 263 (64.10%) of the respondents belong to the income level of ≥1,347 Ethiopia (Table 1).

3.2. Obstetric characteristics of the respondents

The majority of the participants were multigravida 272 (66.30%). Nearly half (46.60%) of them had 1-2 number of living children while more than 90% of the women had no history of miscarriage. Forty-six percent of the women were within four to six months pregnant followed

by seven to nine months of pregnancy. Half of the pregnant women commenced their antenatal care and visited the health institution 1-2 times (Table 2).

Table 1. Socio-demographic characteristics of pregnant women in Arba Minch town, Southern Ethiopia,2020 (n=410)

Variables	Categories	Frequency (n)	Percentage (%)
Age	< 25	177	43.20
	≥ 25	233	56.80
Religion	Orthodox	137	33.40
	Protestant	231	56.30
	Catholic	10	2.40
	Muslim	32	7.80
Marital status	Married	390	95.10
	Divorced	13	3.20
	Widowed	7	1.70
Woman educational Status	Unable to read and write	36	8.80
	Non-formal education	24	5.90
	Primary school (1-8grades)	176	42.90
	High school (9-12 grades)	88	21.50
	College/University	86	20.90
Husband educational status	Unable to read and write	13	3.20
	Non-formal education	52	12.70
	Primary school(1-8grade)	107	26.10
	High school(9-12 grades)	115	28.00
	College/university	123	30.00
	Employed	75	18.30
Occupation	Non employed	335	81.70
Income (ETB)	(Mean income)	1347	
	< 1347	147	35.90
	≥ 1347	263	64.10

Approximately a quarter of the study respondents 29.3% revealed that family/friends were the commonest source of information. From total respondents, 233(56.83%) of the pregnant women reported that antenatal exercise reduces the risk of back pain (Table 3).

3.3 Pregnant women's knowledge about antenatal exercise.

The majority, 219(53.40%) of the pregnant women responded that excessive weight can be prevented by antenatal exercise. About 235(57.30%) of pregnant women reported that antenatal exercise increases energy and stamina. A total of 217(52.90%) women indicated that antenatal exercise helps to cope with labor and delivery pain. Regarding the contraindication of antenatal exercise, a total of 199(48.53%) pregnant women reported vaginal bleeding as contraindication for antenatal exercise (Table 4). The mean score value of pregnant women's

knowledge about antenatal exercise was 7.99 out of 16. Among all participants, only 190 (46.34%) scored above the mean value and had adequate knowledge about the antenatal exercise.

Table 2. Obstetrical characteristics of pregnant women in Arba Minch town, Southern Ethiopia, 2020 (n=410)

Characteristics	Gravidity	Frequency (n)	Percent (%)
Parity	Primi-gravida	138	33.70
	Multigravida	272	66.30
	Nulliparous	136	33.20
	Prim-parous	135	32.90
	Multiparous	140	34.10
Number of alive child they have	No child	135	32.90
	1-2	191	46.60
	>2	83	20.20
History of miscarriage	Yes	39	9.50
	No	371	90.50
Gestational age	<4 months	34	8.30
	4-6 months	189	46.10
	7-9 months	187	45.60
ANC follow up	Not started	102	24.90
	1-2	208	50.70
	Three and above	100	24.40

Table 3. Source of information about antenatal exercise among pregnant women in Arba Minch town, Southern Ethiopia, 2020

Source	Frequency	Percent (%)
Health care provider	97	23.7%
Health extension worker health	99	24.1%
Family/friends	120	29.3%
Mass media Tv	43	10.5%
Internet	38	9.3%
Books	13	3.2%
Total	410	100.0

3.4 Factors associated with knowledge towards antenatal exercise

Bi-variable and multi-variable logistic regression analyses were done to assess the association between the selected variables and knowledge towards antenatal exercise. During adjusted binary logistic regression analysis, six explanatory variables were statistically significant associated. These were women's educational level, income level, occupation, gravidity, pregnancy months and age of the women (Table 5).

Table 4. Knowledge result of antenatal exercise of pregnant women in Arba Minch town, Southern Ethiopia, 2020 (n=410)

Benefits and contraindiction of antenatal exercise	Response	Frequency	Percent
Reduces risk of back pain	Yes	233	56.83
	No	197	43.70
Prevents excessive weight gain	Yes	219	53.40
	No	191	46.60
Increases energy and stamina	Yes	235	57.30
	No	175	42.70
Help cope with labor and delivery pain	Yes	217	52.90
	No	193	47.10
Can reduces risk of DM	Yes	143	34.90
	No	267	65.10
Can decrease high blood pressure during pregnancy	Yes	196	47.80
	No	214	52.20
Helps more rapid postnatal recovery	Yes	190	46.30
	No	220	53.70
Can prevents antenatal and postnatal depression	Yes	213	52.00
	No	197	48.00
Benefits general health and development of the baby	Yes	241	58.80
	No	169	42.00
Contraindications			
Vaginal bleeding	Yes	199	48.50
	No	211	51.50
Uterine contractions	Yes	185	45.10
	No	225	55.90
Chest pain	Yes	196	47.80
	No	214	52.20
Difficulty of breathing	Yes	205	50.00
	No	205	50.00
Premature labour	Yes	201	49.00
	No	209	51.00
Poorly controlled type 1 Diabetic	Yes	179	43.70
	No	231	56.30
Dizziness	Yes	227	55.40
	No	183	44.60

Pregnant women who had high school education were 2.451 times more likely to be knowledgeable about antenatal exercise compared to those who had graduated from college/university and above level [AOR= 2.451, (95%CI 1.039-5.778)]. Those non-employed pregnant women were 67% less knowledgeable about antenatal exercise compared to those who were employed [AOR=0.330, (95%CI 0.141-0.770)]. The pregnant women having a monthly income level less than 1,347 Ethiopian birr (ETB) were 45.10% less knowledgeable about

antenatal exercise, compared to those who had a monthly income of ≥ 1,347 ETB [AOR= 0.549, (95% CI 0.326-0.925)].

Table 5. Bi-variable and multi-variable analysis of factors associated with knowledge towards antenatal exercise in Arba Minch town, Southern Ethiopia, 2020 (n=419)

Variables	Categories	AK	IAK	COR (95% CI)	AOR (95% CI)	P-value
Women educational status	Unable to read and write	6	30	0.241(0.091,.638)	0.381(0.118,1.23)	0.108
	Non-formal education	7	17	0.496(0.187,1.31)	0.971(0.283,3.33)	0.962
	Primary school	39	49	0.959(0.528,1.74)	0.524(0.220,1.25)	0.146
	High school	99	77	1.549(0.922,2.60)	2.451(1.039,5.77)	0.041*
	College/University and above	39	47	1	1	
Occupation	Non-employed	150	185	0.709(0.429,1.17)	0.330(0.141,0.77)	0.010*
	Employed	40	35	1	1	
Monthly	< 1,347	133	130	0.706(0.469,1.0)	0.549(0.326,0.92)	0.024*
Income (ETB)	>= 1,347	87	60	1	1	
Gravidity	One times	60	78	2.000(1.009,3.96)	3.147(1.386,7.14)	
	2-3	115	103	2.903(1.512,5.57)	3.281(1.608,6.69)	0.001*
	more than 3	15	39	1	1	
Pregnancy	< 4 months	13	21	0.539(0.255,1.13)	0.531(.233,1.207)	0.131
Month	4-6 months	77	112	0.598(0.398,0.90)	0.584(0.377,0.90)	0.016*
	7-9 months	100	87	1	1	
Age (in years)	< 25	71	106	0.642(0.432,0.95)	0.488(0.298,0.79)	0.004*

AK: Adequate knowledge, IAK: Inadequate knowledge, CI: Confidence interval, COR: crude odds ratio, AOR: adjusted odds ratio, *statistically significant (p <0.05), '1' reference category.

Those women who were prim-gravida and two to three gravida were 3.147 and 3.281 times more likely to be knowledgeable about antenatal exercise than those women who had above three pregnancies [AOR=3.147, (95% CI 1.386 - 7.147)] and [AOR=3.281, (95%CI 1.608,6.695)] respectively. Pregnant women having four to six months of pregnancy were 41.60% less knowledgeable about antenatal exercise than those pregnant women who had seven to nine months [AOR= 0.584, (95%CI0.377-0.905)]. The pregnant women with the age less than 25 years were 51.20% less knowledgeable about antenatal exercise compared to those whose age is more than 25 years [AOR=0.488, (95%CI0.298, 0.798)].

4. Discussion

In this study, 46% (95%CI 41%-51%) of respondents had adequate knowledge about antenatal exercise. This finding is in line with studies done in Colombo sri Lankan, India and Nigeria (Herath et al., 2016; Chidozie Emmanuel Mbada et al., 2015; Sujindra et al., 2015). However, the finding of this study is lower than studies done in Saudi Arabia and Brazil (Al Rahi et al., 2018; Ribeiro & Milanez, 2011). This might be due to socio-demographic and the absence of Ethiopian antenatal exercise guideline. The study conducted in South Africa showed that women were willing to follow a set of guidelines with supervision to be involved in exercise and it could be due to a positive influence of education and society on the awareness of pregnant women (Au, 2017). However, the finding of this study is higher than a study conducted in Zambia. This discrepancy might be due to factors like differences in educational level, modernization, and other socio-demographic characteristics and difference in accessing information.

Women with high school educational level were more likely to have adequate knowledge to antenatal exercise compared to higher level. These findings are similar to results reported from a study conducted in Zambia (Ribeiro and Milanez, 2011; Sujindra et al., 2015). This may be due to those women were more concerned to the advice given to them about antenatal exercise. Those women having gravidity of one and two or three were more likely to have the knowledge to antenatal exercise. This is in agreement with a study conducted in Zambia. This may be due to the women with the subsequent pregnancies are gaining knowledge of antenatal exercise from earlier pregnancies. Pregnant women with four to six pregnancy months were less likely to have adequate knowledge than those women with seven to nine months. This may be due to as the months of pregnancy increases the antenatal visit increases; this gives the chance for women to get more information about antenatal exercise. Income influences the knowledge of antenatal exercises of women. Those women with higher income were more likely to have adequate knowledge of antenatal exercise when compared with women having low income. This might be due to they can afford the source of information including televisions and other smartphones which may easily link them with social media. The study also showed that occupation influences knowledge of antenatal exercise. Those none employed women were less likely to have adequate knowledge of antenatal exercises compared with employed ones.

This finding was similar to a study conducted in Sri Lankan (Wijesiriwardana and Gunawardena, 2016). This may be due to employed women can access different information

about antenatal exercise from a variety of sources, from the work place and colleagues. And also, the more employed occupation status, the more income level. This study also revealed that, those women whose age was less than 25 years was less likely to have adequate knowledge of antenatal exercise when compared with women having age greater than 25 years. This may be due to when the age increases the women get more pregnancies, have more exposure to many antenatal visits and get more informed.

5. Conclusions

In this study the knowledge of antenatal exercise was inadequate. Educational status, income level, occupation, gravidity, months of pregnancy and age were identified as statistically significant factors associated with knowledge of antenatal exercise. Therefore, interventions targeting to improve the income and employment status of pregnant women by giving special consideration for those less than 25 years old and further qualitative study are recommended.

Conflict of Interest

The author (s) did not disclose any potential conflicts of interest

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Ethical approval and consent to participate

The ethical clearance board of Arba Minch University, College of Medicine and Health Sciences ethically approved all the study methods and protocols and responded with a letter reference number IRB/129/12 on the date of 14/11/2019. Informed consent was taken from pregnant women before data collection.

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