International Journal of Scientific Reports
Yimer A et al. Int J Sci Rep. 2025 Jan;11(1):1-11
http://www.sci-rep.com

pISSN 2454-2156 | eISSN 2454-2164

DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20243801

Original Research Article

Prevalence and factors associated with exercise in pregnant women in Dessie town health facilities, Ethiopia

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Received: 02 October 2024
Revised: 07 November 2024
Accepted: 08 November 2024

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ABSTRACT

Background: Physical exercise (PEx) consists of planned, repetitive and intentional movements that can reduce the risk of pregnancy related complications. Worldwide, there is a high rate of physical inactivity during pregnancy. Therefore, this study aimed to assess prevalence and factors associated with practice of PEx during pregnancy among antenatal care attendants at selected health facilities in Dessie town, Ethiopia, 2023.
Methods: An institutional based cross-sectional study was conducted among 642 pregnant women receiving antenatal care service from 20th May to 20th July, 2023. The study participants were selected by using systematic random sampling technique. Data were collected through pretested, face to face interviewer-administered. The data were cleaned, coded and entered into EPIDATA version 4.6 and analyzed by SPSS version 25. Binary logistic regression analysis was performed to identify factors associated with practice of PEx during pregnancy. Finally, the AOR at 95% confidence interval with $p<0.05$ in multivariable analysis were considered to declare a variable is statistically significant.
Results: The prevalence of practice of PEx during pregnancy in this study was 32.2%. Age of women (25 to 34 years), antenatal care follow-up (three and more times), hadn't history of abortion, ever done PEx before becoming pregnant, and good knowledge towards PEx during pregnancy were found positively statistically significant association with practice of PEx during pregnancy.
Conclusions: In the current study, nearly one-third of the study participants practiced PEx during current pregnancy. Therefore, antenatal care providers should give advice pregnant women to strengthen antenatal care follow-up and offer health education and counseling regarding PEx during pregnancy during antenatal care follow-up.

Keywords: Practice, PEx, Antenatal care, Dessie, Ethiopia

INTRODUCTION

Physical activity involves all bodily movements produced by the contraction and relaxation of skeletal muscles. PEx is a type of physical activity that consists of planned, repetitive and intentional movements that have numerous health benefits for pregnant women and their fetuses.[1,2] Recommended types of PEx during pregnancy include walking, relaxation/breathing exercises, pelvic floor exercises, back care exercises, ankle and toe exercises, aerobic swimming, and labor preparation exercises like squatting and pelvic tilts. According to the American college of obstetrics and gynecology (ACOG) committee opinion No. 804 and the American college of sports medicine (ACSM), light to moderate PEx during pregnancy is generally safe and beneficial for most women. Pregnant women should aim for at least 150 minutes of moderate-intensity exercise per week, spread

over at least three days per week, with sessions lasting a minimum of 30 minutes each.[1,3,4] Engaging in PEx during pregnancy enhances physical fitness, reduces gestational weight gain, lowers the risk of gestational diabetes, decreases cesarean section rates, and mitigates issues such as hypertension, postpartum depression, instrumental deliveries, urinary incontinence, peripartum pain, and macrosomia.[1,2,4,5] Several studies have documented the health benefits of participating in planed and repeated PEx during pregnancy. These includes, 35% reduction in excessive maternal gestational weight gain, 55% reduction in gestational diabetes mellitus and its complications, 11.2% increase in the likelihood of vaginal delivery and reduced cesarean delivery rate by 66% compared to physically inactive and reduced the risk of macrosomia, the rate of operative deliveries, low back pain, antenatal and postnatal depression and shorten the durations of labor and reduce delivery complications, quick recovery after childbirth and getting back to the pre-pregnancy shape and helps to cope up with labor pain.[1,5-10] In addition, participating in PEx like walking reduce the risk of hypertensive disorder during pregnancy by 30-33%.[6]

Despite the clear benefits of PEx during pregnancy, there is a rise in physical inactivity that has serious health repercussions implications including increased non-communicable diseases such as hypertensive disorder during pregnancy and gestational diabetes mellitus which are contributed for maternal deaths.[11,12] Evidence depicted that, pregnant women who are physically inactive during pregnancy are at increased risk of excessive gestational weight gain, hypertensive disorder, gestational diabetes mellitus, complications during labor and delivery, instrumental delivery, postpartum weight retention, low back pain, increase the risk of urinary incontinence and antenatal and postnatal depression.[1,13,14]

According to world health organization (WHO) report in 2015, an estimated 3.2 million of the global deaths are caused by physical inactivity.[15] Less than 15% of pregnant women actually achieve the minimum recommended 150 minutes per week of moderate-intensity PEx during their pregnancy.[2] Comprehensive antenatal care is an effective intervention to prevent maternal morbidity and mortality. This care aim to ensure a positive pregnancy and birth experience by identifying risks, managing pregnancy-related complications, and health education and promotion.[16,17] One of the health promotion and preventive measure for pregnancy-related complications is PEx during pregnancy.[1,2] PEx stands out as reliable, safe and beneficial throughout pregnancy for both the pregnant women and fetuses, provided there are no obstetric or medical contraindications.[2,5,18]

Nevertheless, there is wide variation in terms practice of PEx during pregnancy. Researchers around the world have documented that the magnitude of practice of PEx during pregnancy in developing countries and to some extent in developed countries was low and does not meet ACOG requirements.[19-23] A systematic review conducted in Africa found that the magnitude of practice of PEx during pregnancy was low.[24] The magnitude of practice of PEx during pregnancy in pregnant Ethiopian women was found to be low, ranging from 20.7% in Mekelle to 25.5% in Sidama.[19,20,25,26] This can be due to numerous factors such as, lack of information from healthcare providers and lack of awareness about benefit of PEx during pregnancy, hadn't habit of practice of PEx before becoming pregnant, history of abortion, poor knowledge about PEx and unfavorable attitude towards PEx during pregnancy.[19,20,25,27]

Although it has many health benefits, little attention has been given to PEx during pregnancy. Therefore, the aim of this study was to assess prevalence and factors associated with practice of physical excercise during pregnancy among antenatal care attendants at selected health facilities in Dessie town, this helps to generate information about practice of pregnant women and identify their misconceptions about PEx during pregnancy. Also, this study enable evidence-based interventions, improving maternal health care service by incorporating PEx during pregnancy and designing appropriate strategies to prevent pregnancy comorbidities and promote maternal, fetal health and wellbeing.

METHODS

Study area, design, and period

Institutional based cross-sectional study was conducted at Dessie town health facilities from 20th May to 20th July, 2023. The town is found in South Wollo Zone, Amhara region, Northeast Ethiopia, and is approximately 401 km away from Addis Ababa the capital city of Ethiopia. The town has 2 governmental hospitals, 8 governmental health centers, 4 private hospitals and 73 private clinics. Among these, 17 health facilities (10 governmental and 7 private) provide maternal and child health related services. In April 2023, and 1,223 pregnant women were attended ANC follow-up at these health facilities.

Source population

All pregnant women who had attended ANC follow-up at Dessie town health facilities were selected.

Study population

All pregnant women who had attended ANC follow-up at randomly selected 5 public and 4 private health facilities in Dessie town during study period were selected.

Study unit

Selected pregnant women who had attended ANC follow-up at the selected five public and four private health facilities during the study period and met inclusion criteria.

Inclusion criteria

All pregnant women who had attended ANC follow-up at the selected five public and four private health facilities in Dessie town during study period were included.

Exclusion criteria

Those pregnant women who had personal unwillingness and unable to communicate can be used as an exit criterion.

Sample size determination

The required sample size was calculated based on prevalence and factors associated with practice of physical excercise during pregnancy among antenatal care attendants. The following assumptions were taken into account when calculating the sample size for the dependent variable using a single population proportion formula: 25.5% of pregnant women who had engaged in PEx during their pregnancy.[26] Using the double proportion formula and EPI Info version 7, the associated factors were computed with a 5% margin of error, a 95% confidence interval, and 80% power.

The study considered the maximum calculated sample size. Therefore, the magnitude of practice of PEx during pregnancy taken from a study conducted in Sidama region, Ethiopia was given the maximum sample size (292).[26] Then, using 2 design effect and by considering 10% (58) of non-response rate and the final sample size becomes 642 study participants.

Sampling techniques and procedures

A simple random sampling technique was used to select five out of ten governmental health facilities and four out of seven private health facilities. The numbers of ANC attending pregnant women surveyed from ANC follow-up registration book from the nine selected health facilities from 1st to 30th April 2023 was 1194 and was taken as a reference to estimate the ANC load in selected health facilities. Then, the total sample size (n=642) was proportionally allocated for nine health facilities depending on number of pregnant women flow in each health facilities. Each study participant was selected by using systematic random sampling technique at every Kth interval (K=N/n=1194/642=2) from each health facilities. First study participant was selected by using lottery method either from order 1 or 2 participant. The study unit was selected every two intervals until desired sample size was attained. In case of unwillingness to participate, immediate next participant was taken (Figure 1).

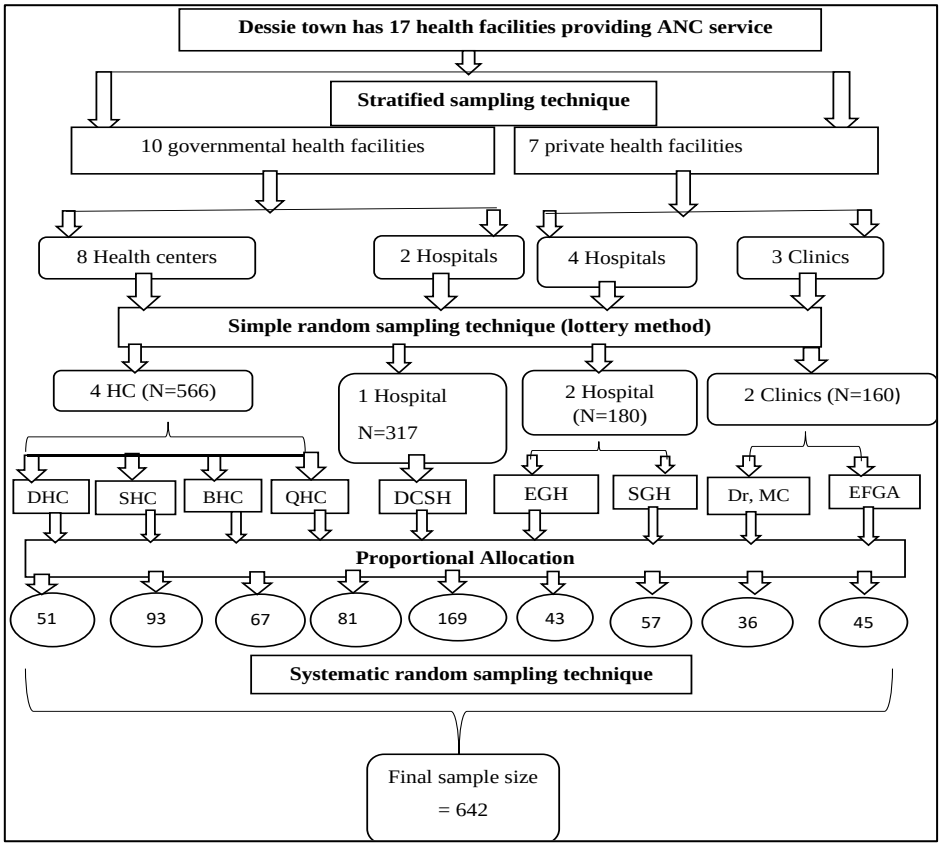

Figure 1: Schematic presentation of sampling procedure.

Key: DRH=Dessie comprehensive, EFGA=Family guidance association, Specialized hospital, DHC=Dessie health center, SHC=Segno gebaye health center, EGH=Ethio general hospital, BHC=Buambuha health center, W/r SGH= W/r Sihn general hospital, HC=Qurqur health center, Dr.MC=Dr. Mnase clinic

Study variables

Dependent variable: Practice of PEx during pregnancy

Independent variables: Socio-demographic related characteristics, obstetrical related characteristics, and awareness of pregnant women's towards PEx during pregnancy related characteristics, pregnant women's knowledge and attitude towards PEx during pregnancy related characteristics.

Operational definitions

Knowledge towards PEx during pregnancy: Pregnant women's ideas about the health benefits and contraindications of PEx during pregnancy.[19,22,25,28,29]

Good knowledge: Participants whose responses were greater than or equal to the mean value (2.4942**)** of knowledge towards PEx during pregnancy questions.[19,22,25,28,29]

Poor knowledge: Participants whose responses were less than the mean value (2.4942**)** of knowledge towards PEx during pregnancy questions.[19,22,25,28,29]

Attitude towards PEx during pregnancy: The opinion of pregnant woman with respect to performing PEx during pregnancy.[19,22,25,28,29]

Favorable attitude: Participants whose responses were greater than or equal to the mean value (3.6439) of attitude towards PEx during pregnancy questions.[19,22,25,28,29]

Unfavorable attitude: Participants whose responses were less than the mean value (3.6439) of attitude towards PEx during pregnancy questions.[19,22,25,28,29]

Practice of PEx during pregnancy: A pregnant woman who were participated in or perform any type of ACOG recommended antenatal PEx during their current pregnancy.[1]

Currently practiced: Those pregnant women who were practiced any type of PEx during pregnancy in frequency at least 3 times in a week and duration ≥30 minute per session.[1]

Not currently practiced: Those pregnant women who were practiced any type of PEx during pregnancy in frequency less than 3 times in a week and duration <30 minute per session.[1]

Data collection tools and procedures

Data were collected using a pretested, face to face interviewer-administered and semi-structured questionnaire. The tool was adopted and adapted from different literature reviewed and based on ACOG recommendations of PEx during pregnancy.[1,19,25,27-30] The interview questionnaire consisted of six parts: the first part was both open and close-ended questionnaire assessing socio-demographic characteristics, the second part was an open-ended questionnaire assessing obstetric characteristics, the third part was a close-ended questionnaire assessing awareness of pregnant women's towards PEx during pregnancy.

The fourth and fifth part were a close-ended questionnaire assessing knowledge and attitude of pregnant women towards PEx during pregnancy respectively. The sixth part was both open and close-ended questionnaire assessing practice of pregnant women towards PEx during pregnancy.

A total of nine data collectors were involved in data collection and one Master holder public health officer was assigned for supervision. Data collectors and supervisor were trained for two day on objectives of the study, how to fill data, procedures during interviewing, confidentiality of participant's information, eligibility criteria, respondents' right, informed consent, and ways of approach during interview. A close monitoring was carried out throughout the data collection process.

Data quality control

The tool was developed in English, translated into Amharic, and then back-translated to ensure accuracy. Four academicians reviewed the tool to determine its content validity, resulting in a content validity index of 0.95 (I-CVI=0.95) based on their evaluations. Valuable suggestions and recommendations from experts were incorporated into the tool. Data were collected using the Amharic version questionnaire for better understanding by data collectors and study participants.

A pretest was conducted at Kombolcha general hospital with 5% of the sample size. The tool was assessed for clarity, readability, comprehensiveness, and accuracy. Feedback was incorporated.

The data collection process was monitored by the supervisor and principal investigator throughout the data collection period. Internal consistency/reliability of the item was checked by computing Cronbach's alpha was assessed to ensure accurate data collection. The value of Cronbach's alpha for practice assessment was 0.79.

Data processing and analysis

Data were checked for completeness and cleaned manually. The study participant's code number in the questionnaire was identified and the appropriate variable name and label was given by data coding and data were entered into Epi data software version 4.6.0.0. Finally, the data were exported to and analyzed by SPSS software version 25. Descriptive statistics (mean, median, standard

deviation and percentage) were used to summarize the data. Bivariate logistic regression analysis was done to identify the association between each independent variables with practice of pregnant women towards PEx during pregnancy. Variables with p<0.2 in the bivariate analysis were entered into multivariable logistic regression analysis to identify independent variables associated with the dependent variable. In multivariable logistic regression analysis, variables having p<0.05 were considered as statistically significant and reported and interpreted the results using adjusted odds ratio (AOR) with 95% confidence interval. The Hosmer-Lemeshow goodness-of-fit test was 0.716. Multicollinearity assumptions were tested by variance inflation factor (VIF=1.263). Finally, the whole results were presented in the form of texts, tables and graphs.

Ethical consideration

The institutional research ethical review committee (IRERC) of Wollo university, college of medicine and health sciences, approved the study with letter reference number CMHS/749/2023 on 01/05/2023. After receiving ethical clearance, a formal permission letter was sent to the Dessie town administration health department from Wollo University. A letter of support was then obtained from the Dessie town administration health department with letter reference number ደከጤ-3/955/2023 on 08/05/2023. The letter of support was submitted to nine health institutions.

Permission was also obtained from each of the study health institutions, as well as from the heads of the ANC ward. Prior to enrollment, the study participants were informed about the study objectives and were asked for their willingness to participate. They were informed of their right to decline participation, to stop at any time, or to refuse to answer any questions they were uncomfortable with. Written consent was obtained from all study participants before data collection. Confidentiality was maintained throughout the study to protect the personal identification of participants.

RESULTS

Socio-demographic characteristics of study participants

Out of 642 pregnant women who were expected to participate, 600 pregnant women were participated in this study with a response rate of 93.5%. More than half (58.8%) of the participants were in the age category between 25-34 years. The great majority 98.7% (n=592) of the participants were married. Regarding their occupation, 44.3% of the study participants were housewife (Table 1).

Obstetrics characteristics of study participants

Regarding ANC follow-up, nearly half (44.2%) of the participants had attended three and more than three times ANC follow-up. Almost half of the study participants were within 7 to 9 months of pregnancy (Table 2).

Awareness of pregnant women about PEx during pregnancy

Two hundred thirty six (39.3%) of the study participants had heard about PEx during pregnancy.

Of those who heard about PEx during pregnancy all (100%), 13.6%, 10.2% and 4.2% of the study participants were heard walking, relaxation/breathing, preparing for labor: squatting and pelvic tilts and pelvic floor muscle exercise respectively (Table 3).

Source of information of pregnant women about PEx during pregnancy

Their source of information about PEx during pregnancy were family and friend, mass media (television and radio), healthcare providers and social media accounting for 44.92%, 24.15%, 20.34% and 10.59%, respectively (Figure 2).

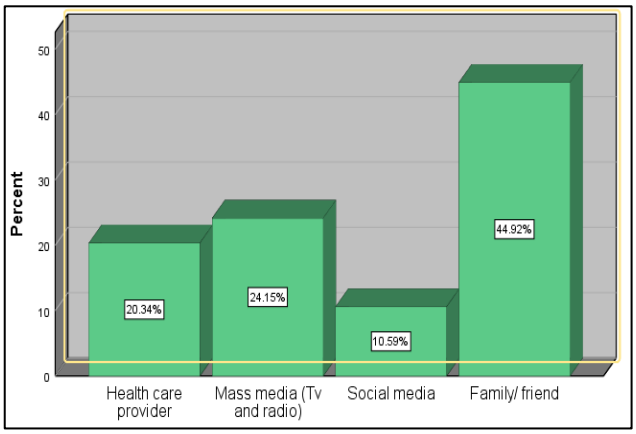

Figure 2: Source of information of pregnant women about PEx during pregnancy among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023, (n=236).

Knowledge of pregnant women towards PEx during pregnancy

Regarding knowledge assessment questions about benefits of PEx during pregnancy 40.7%, 63.5%, 88.8%, 75.3% and 62.5% of the study participants knew that PEx during pregnancy can reduce the risk of excessive weight gain, strengthening pelvic floor muscles, prevent antenatal, postnatal depression, had benefit for general health and development of baby and better ability to cope with labor and delivery respectively. Regarding contraindications of PEx during pregnancy 56 %, 59.7 %, 100% and 54% of the study participants knew that chest pain, difficulty in breathing, vaginal bleeding and decreased fetus movement during pregnancy were contraindicated for doing PEx during pregnancy respectively, (Table 4).

Table 1: Socio-demographic characteristics of pregnant women among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023, (n=600).

Variables	Category	N	Percent (%)
Age of women (in years)	<25	142	23.7
	25-34	353	58.8
	≥35	105	17.5
Religion	Muslim	314	52.3
	Orthodox	267	44.5
	Protestant	6	1.0
	Catholic	13	2.2
Women's educational level	No formal education	99	16.5
	Primary school	202	33.7
	Secondary school	193	32.2
	College and university	106	17.7
Women's occupation	Governmental employed	96	16.0
	Private business	177	29.5
	Housewife	266	44.3
	Non-governmental	61	10.2
Average monthly income in Ethiopian birr	<1987 ETB	374	62.3
	≥1987 ETB	226	37.7

Table 2: Obstetrics characteristics of pregnant women among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023, (n=600).

Variables	Category	N	Percent (%)
ANC follow up	Not started	98	16.3
	1-2	237	39.5
	Three and above	265	44.2
Gravidity	Primigravida	252	42.0
	Multigravida	348	58.0
Parity	Nulliparous	277	46.2
	Primiparous	197	32.8
	Multiparous	126	21.0
Number of alive children they have	No child	276	46.0
	1-2 child	241	40.2
	>2 child	83	13.8
History of abortion	Yes	66	11.0
	No	534	89.0
Gestational age	<4 months	71	11.8
	4-6 months	233	38.8
	7-9 months	296	49.3

Table 3: Awareness of pregnant women about PEx during pregnancy among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023, (n=600).

Variables	Category	N	Percent (%)
Ever heard about PEx during pregnancy, (n=600)	Yes	236	39.3
	No	364	60.7
Types of PEx during pregnancy you heard or aware, (n=236)*	Walking	236	100.0
	Relaxation/ breathing	32	13.6
	Pelvic floor exercise	10	4.2
	Back care exercises	1	0.4
	Ankle and toe exercise	1	0.4
	Swimming	5	2.1
	Preparing for labor: Squatting and pelvic tilts	24	10.2
Ever done PEx before becoming pregnant, (n=600)	Yes	71	11.8
	No	529	88.2

***** Multiple responses

Table 4: PEx during pregnancy knowledge level among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023, (n=600).

Variables	Category	N	Percent (%)
Benefits			
Reduces risk of back pain during pregnancy	I don't now	72	12.0
	No	23	3.8
	Yes	505	84.2
Reduces the risk of gestational diabetes mellitus	I don't now	98	16.3
	No	25	4.2
	Yes	477	79.5
Reduce risk of hypertension	I don't now	125	20.8
	No	25	4.2
	Yes	450	75.0
More rapid post-natal recovery?	I don't now	199	33.2
	No	5	0.8
	Yes	396	66.0
Contraindications			
Poorly controlled gestational diabetes mellitus during pregnancy	I don't now	253	42.2
	No	7	1.2
	Yes	340	56.6
Uncontrolled hypertension during pregnancy	I don't now	112	18.7
	No	7	1.2
	Yes	481	80.1
Uterine contractions during pregnancy	I don't now	46	7.7
	No	0	0.0
	Yes	554	92.3
Overall knowledge level of pregnant women towards PEx during pregnancy	Good	338	56.33%
	Poor	262	43.67

Table 5: PEx during pregnancy attitude level among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023, (n=600).

Variables	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	N	%	N	%	N	%	N	%	N	%
Do you feel performing PEx during pregnancy is necessary?	4	0.7	15	2.5	32	5.3	382	63.7	167	27.8
Do you feel performing PEx during pregnancy has risky to the fetus?	203	33.8	167	27.8	200	33.3	28	4.7	2	0.3
Do you feel antenatal exercise suit with our culture?	2	0.3	19	3.2	133	22.2	316	52.7	130	21.7
Do you feel pregnant women should perform PEx under the guidance of health care professional?	7	1.2	26	4.3	62	10.3	342	57	163	27.2
Do you feel performing antenatal PEx can reduce pregnancy-related complications?	0	0.0	42	7.0	204	34.0	240	43.3	94	15.7
Do you feel practicing PEx during pregnancy helps in post-delivery recovery?	1	0.2	35	5.8	230	38.3	255	42.5	79	13.3
Do you feel PEx exercising will helps you get back to your shape?	1	0.2	29	4.8	223	37.2	247	41.2	100	16.7
Do you think regular PEx facilitates normal delivery?	1	0.2	36	6.0	183	30.5	300	50.0	80	13.3
Overall attitude of pregnant women towards PA during pregnancy			**N**				**Percent (%)**			
	Favorable		309				51.5%			
	Unfavorable		291				48.5%			

Table 6: Pregnant women's practice of PEx during pregnancy among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023, (n=600).

Variables	Category	N	Percent (%)
Do you practice any type of PEx in current pregnancy, (n=600)	Yes	193	32.2
	No	407	67.8
Who advised you to do PEx during pregnancy, (n=193)?	Healthcare provider	40	20.7
	Self	83	43.0
	Other person	70	36.3
How many times per week you exercised, (n=193)?	<3 times	151	78.2
	≥3 times	42	21.8
For how many minutes you exercised per session, (n=193)?	<30 minutes	87	45.1
	≥30 minutes	106	54.9

Table 7: Reasons for pregnant women's didn't practiced PEx during pregnancy, (n=407).

Reasons (n=407)*	N	Percent (%)
Is afraid that it may be harmful for fetus	27	6.7
Lack of time	110	27.2
Lack of motivation	39	9.6
I don't have information	78	19.2
Pregnancy discomfort	8	2.0
My health professional didn't advised me to do exercise	162	39.9
I am not in good health	4	1.0
Because of cultural reason	0	0.0
Feel tired	25	6.2

* Multiple response.

Attitude of pregnant women towards PEx during pregnancy

Regarding attitude assessment questions towards PEx during pregnancy about 63.7% (382) of the study participants were agree that PEx during pregnancy is necessary. One third (33.8%) of study participants strongly disagreed that PEx during pregnancy has risk to fetus (Table 5).

Pregnant women's practice of PEx during pregnancy

Regarding practice of PEx during pregnancy almost one-third (32.2%) of the study participants were practiced PEx in their current pregnancy. Among those who practiced PEx during pregnancy all 100% (n=193) of the study participants were practiced walking, followed by relaxation/breathing, pelvic floor muscle exercise, preparing for labor: squatting and pelvic tilts with value of 9.8%, 7.8%, and 6.7% respectively (Table 6).

The most common reasons for pregnant women's didn't practiced PEx during pregnancy were my health professional didn't advised me to do exercise, lack of time, and I don't have information were 39.9%, 27.2% and 19.2% respectively (Table 7).

Factors associated with practice of PEx during pregnancy

Bivariate and multivariable binary logistic regression analysis were conducted to assess the association between physical activity pregnant women and its determinants. In bivariate logistic regression analysis, nine independent variables such as; age, level of education, occupation, income level, ANC follow-up, history of abortion, ever done PA before becoming pregnant, knowledge and attitude were eligible for multivariable logistic regression analysis with cutoff points ($p<0.2$).

After conducting multivariable logistic regression variables such as level of education, occupation, income level and attitude have found to be statistically insignificant association with PA status of pregnant women during multivariable analysis, but age (25 to 34 years), ANC follow-up (three and more times), history of abortion, ever done PA before becoming pregnant and good knowledge of pregnant women were statistically significant association with PA status of pregnant women during multivariable analysis.

After controlling cofounders, those pregnant women whose age were between 25 to 34 years were nearly seven times more likely to perform PA during pregnancy than pregnant women whose age were less than 25 years [AOR=7.186, 95% CI (3.853,13.404)].

Those pregnant women who had attended three and more than three times ANC follow-up were nearly two times more likely to perform PA during pregnancy than pregnant women who hadn't started ANC follow-up [AOR=2.082, 95% CI (1.116, 3.884)].

Those pregnant women who hadn't history of abortion were 6.518 times more likely to perform PA during pregnancy when compared to pregnant women who had history of abortion [AOR=6.518, 95% CI (2.992, 14.220)].

Those pregnant women who had ever done PA before becoming pregnant were 3.441 times more likely to perform PA during pregnancy when compared to pregnant women who had never done PEx before becoming pregnant [AOR=3.441, 95% CI (1.763, 6.718)].

Moreover, those pregnant women who had good knowledge towards PA during pregnancy were 13.541 times more likely to perform PA during pregnancy when compared to pregnant women who had poor knowledge [AOR=13.541, 95% CI (7.841, 23.387)] (Table 8).

Table 8: Bivariate and multivariable logistic regression analysis for factors associated with practice of pregnant women towards PEx during pregnancy among ANC attendants at selected health facilities in Dessie town, Ethiopia, 2023.

Variables		Currently practice PEx		COR (95% CI)	AOR (95% CI)
		No, N (%)	Yes, N (%)		
Age (in years)	<25	126 (88.7)	16 (11.3)	1	1
	25-34	191 (54.1)	162 (45.9)	6.679 (3.813,11.702)*	7.186 (3.853, 13.404)*
	≥35	90 (85.7)	15 (14.3)	1.312 (0.617,2.791)	1.695 (0.727, 3.953)
ANC follow-up	Not started	71 (72.4)	27 (27.6)	1	1
	1 -2	167 (70.5)	70 (29.5)	1.102 (0.653,1.861)	1.654 (0.877, 3.119)
	3 and more	169 (63.8)	96 (36.2)	1.494 (0.898,2.485)**	2.082 (1.116, 3.884)*
Abortion	Yes	55 (83.3)	11 (16.7)	1	1
	No	352 (65.9)	182 (34.1)	2.585 (1.321,5.060)*	6.518 (2.992, 14.220)*
PEx before becoming pregnant	No	380 (71.8)	149 (28.2)	1	1
	Yes	27 (38.0)	44 (62.0)	4.156 (2.483,6.957)*	3.441 (1.763, 6.718)*
Knowledge	Poor	243 (92.7)	19 (7.3)	1	1
	Good	164 (48.5)	174 (51.5)	13.569 (8.121,22.672)*	13.541 (7.841, 23.387)*

Key: 1=reference group, COR=Crude odds ratio, AOR=Adjusted odds ratio, CI=Confidence interval, *p<0.05 variables showing a significant association.

DISCUSSION

The present study attempted to assess prevalence and factors associated with practice of PEx during pregnancy among antenatal care attendants at selected health facilities in Dessie town, Ethiopia.

Prevalence of practice of PEx during pregnancy

The current study found that the prevalence of practice of PEx during current pregnancy was 32.2% (95% CI: 28.42%-35.91%). This finding was in line with previous study conducted in Gondar, Ethiopia 30.9% and Brazil 29%.[22,25]

However, the finding of the current study showed a lower rate of pregnant women's practice of PEx during pregnancy compared with the previous study conducted in Turkey 67.1%, Pakistan 46.2% and Arbaminch, Ethiopia 62.7%.[27,29,31] This disparity may be due to that their study participants had good knowledge, had habit of PEx before becoming pregnant and advised by health care providers to practice PEx during pregnancy.[27,29]

On the other hand, the result of the current study with respect to pregnant women's practice of PEx during current pregnancy was higher than study conducted in Addis Ababa, Ethiopia 22.3%, and Mekelle, Ethiopia 20.7%, India 18%, Saudi Arabia 18%, Sirilanka 13.6% and South Africa 27.7%.[19-21,23,30,32] This higher result in the present study may be due to the fact that, this study include study participants from both private and governmental health institutions, used larger sample size compared to other studies, had better good knowledge and better favorable attitude towards PEx during pregnancy.

Factors associated with practice of PEx during pregnancy

The finding of this study showed that pregnant women whose age from 25 to 34 years were 3.85 times higher odds of practicing PEx during pregnancy as compared to those pregnant women whose age were below 25 years. It was consistent with the study done in Mekelle.[20] This could be because of pregnant women in this age category were more actively participated in different types of PEx during pregnancy and have good knowledge, favorable attitude and better understanding about PEx during pregnancy.

Those pregnant women who had attended three and more than three times ANC follow-up were 2.082 times higher odds of practicing PEx during pregnancy as compared to those who hadn't yet started ANC follow-up. This might be related to repeated health care institution visits for

ANC follow-up increase pregnant women contact with skilled health care providers and enabled them to upgrade their awareness towards PEx during pregnancy.

Those pregnant women who hadn't history of abortion were 6.518 times higher odds of practicing PEx during pregnancy as compared to those who had history of abortion. This finding was in line with the finding of study conducted in Arbaminch.[20,27] The possible reason may explained as pregnant women who hadn't history of abortion in the past may not fear of risk to the fetus and repeated abortion during practicing PEx during current pregnancy.

Those pregnant women who had ever done PEx before becoming pregnant were 3.441 times higher odds of practicing PEx during pregnancy as compared to those who had never done PEx before becoming pregnant. It was consistent with the study done in Arba Minch and Gonder.[25,27] The possible reason for this association might be due to exercise habit of pregnant women before becoming pregnant were more likely to follow their healthcare providers advice about PEx during pregnancy and those who practiced PEx before becoming pregnant are aware of the health benefits and will continue to exercise during pregnancy.

Those pregnant women who had good knowledge were 13.541 times higher odds of practicing PEx during pregnancy than their counterparts. This finding was in line with the finding of the study conducted in Addis Ababa, Gonder and Arbaminch.[19,25,27] This may be due to the fact that pregnant women who had good knowledge towards PEx during pregnancy knew its purpose of practicing PEx during pregnancy and they are eager and they will perform it regularly.

Strength and limitation

This study's strength lies in its focus on pregnant women in both governmental and private health facilities within the study area. However, there are limitations to consider. Firstly, there may be social desirability bias as the study utilized interview questions to gather data on the practice of PEx assessment. Additionally, there is a risk of recall bias as participants were asked to recall past experiences.

CONCLUSION

According to this study, nearly one-third of pregnant women practiced in PEx during their current pregnancy. Pregnant women in the 25-34 age range, ANC follow-up (three or more times), no history of abortion, prior PEx experience, and good level of knowledge were all positively associated with practice of PEx during pregnancy. In order to improve pregnant women's knowledge and practice of PEx during pregnancy, integrating a structured exercise program into routine antenatal care sessions could increase the practice of PEx among pregnant women, encourage women to practice PEx prior to becoming pregnant, and provide health education and counseling regarding the advantages and contraindications of PEx during pregnancy. The Minister of Health should also use a variety of media outlets, including radio, television, and social media, to adequately raise public awareness of PEx during pregnancy and its health benefits. Additionally, it would be preferable for future researchers to use an objective method, like a pedometer, to evaluate the practice of PEx during pregnancy.

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

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Cite this article as: Yimer A, Endris S, Wossen A, Abate M. Prevalence and factors associated with exercise in pregnant women in Dessie town health facilities, Ethiopia. Int J Sci Rep 2025;11(1):1-11.