

A cross-sectional to determine how knowledgeable pregnant women attending Antenatal Care at Lira Regional Referral Hospital are regarding the benefits and contraindications of Physical activity during pregnancy.

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Abstract

Background:

Physical activity during pregnancy provides many health benefits not only to pregnant mothers but also to the fetuses. Adequate knowledge among pregnant mothers is vital to enhance positive attitudes. This study assessed knowledge of pregnant women on PA in pregnancy among pregnant women attending ANC in Lira Regional Referral Hospital.

Methods:

The cross-sectional study of 152 pregnant women attending antenatal clinic visits in Lira Regional referral Hospital, northern Uganda.

Data were obtained on socio-demographic characteristics of mothers, knowledge, and attitude towards PA in pregnancy.

Results:

Decreasing the risk of swelling of extremities (65%), back pain (73%), and high blood pressure (80%), and promoting better ability to cope with labor and delivery (72%) were the most commonly known benefits of PA in pregnancy and vaginal bleeding (80%), chest pain (70%), difficulty in breathing (77%), abdominal pain (72%), premature labor (73%), muscle physical activity during pregnancy. 46% had adequate overall knowledge of PA weakness and migraine headache (73%) were perceived contraindications of during pregnancy. The knowledge of women was influenced by gestational age ($p=0.007$) and level of education ($p=0.014$).

Conclusion:

The majority of women demonstrated inadequate knowledge of physical activity during pregnancy. Mothers had a fair knowledge of the benefit, but the majority had minimal information about the contraindication and when to start and stop physical activity when they get pregnant.

Recommendation:

Based on the findings, women in this study didn't have comprehensive knowledge about PA during pregnancy, health care providers should be empowered to counsel healthy and fit pregnant women with a comprehensive, evidence-based prenatal exercise guidelines on the safety of involvement in PA during pregnancy.

Keywords: Antenatal Exercise, Physical Activity, Lira Regional Referral Hospital, Pregnant Mothers

1. BACKGROUND

Women should be aware that it is necessary to be physically active during their pregnancy, there are many benefits to this behavior that can make them safe during delivery and after delivery. Pregnant mothers should know the benefits, contraindications of when to stop and start, and the intensity of physical activity during pregnancy, which is well stated by different guidelines.

Pregnancy is a good time to develop healthy lifestyle habits including regular exercise and good nutrition and pregnant. Mothers tend to have reasonable knowledge concerning physical activity during pregnancy. A study done by Carmen and Milanez in 2011 in Brazil found that women had adequate knowledge of physical exercise during pregnancy. Those who do not have healthy lifestyles should be encouraged to view pregnancy as an opportunity to embrace healthier routines (American College of Obstetricians and Gynecologists, ACOG 2015).

Physical activity is any act of bodily movement caused by skeletal muscles contraction and it consists of the following activities: jogging, garden work, household activities and hiking, sex and they are associated with minimal risks and have been shown to benefit most women, these activities should be encouraged among pregnant women although some modifications to exercise routines may be necessary because of normal anatomic and physiologic changes and fetal requirements (ACOG., 2015). Leaving alone activities like collision sports, vigorous games, gymnastics, horseback riding, etc., which puts the mother's and fetus's life at risk should be avoided.

In the interest of informing pregnant mothers on PA during pregnancy and enhancing knowledge, The American College of Obstetricians and Gynecologists came up with the guidelines recommending pregnant mothers engage in aerobic and strength-conditioning exercises before, during, and after pregnancy provided the pregnancy is normal (ACOG., 2022). Similar to the ACOG

guidelines, the South Africa Sports Medicine Association recommends pregnant women with no medical or obstetric complications participate in aerobic and strength-conditioning training at moderate intensity on most or all days of the week to maintain a good fitness level throughout the pregnancy.

The guideline makes clear that physical activity does not increase the incidence of adverse pregnancy and neonatal outcomes (Barsky *et al.*, 2012). Physical activity in pregnancy has a number of benefits which include: reducing the risk of (a)excessive gestational weight gain (Muktabhant, Lawrie, Lumbiganon, & Laopaiboon, 2015), (b) low birth weight, (c) prematurity, and (d) cesarean delivery. Prevent hypertensive disorders (Magro-Malosso, Saccone, Di Tommaso, Roman, & Berghella, 2017), enhance psychological well-being (Haakstad, Torset, & Bø, 2016), and improve physical fitness(Kramer & McDonald, 2009) were also reported as the good outcome of physical activity during pregnancy. And also prevent gestational diabetes, and improve sleep patterns, and mood (RCOG 2006). Obstetrician gynecologists and other obstetric care providers are advised to encourage their patients to continue or commence exercise as an important component of optimal health (ACSM 2014).

Despite the numerous benefits, some conditions will relatively don't allow pregnant mothers to participate in physical activity and such conditions are recurrent pregnancy loss, gestational hypertension, a history of spontaneous preterm birth, mild/moderate cardiovascular or respiratory disease, symptomatic anemia, malnutrition, eating disorder, twin pregnancy after the 28th week, other significant medical conditions. Some conditions will absolutely prevent pregnant mothers from doing pa during pregnancy. such conditions include; ruptured membranes, premature labor, unexplained persistent vaginal bleeding, placenta previa after 28 weeks gestation, preeclampsia, incompetent cervix, intrauterine growth restriction, high-order multiple pregnancy (e.g., triplets), uncontrolled type 1 diabetes, uncontrolled hypertension, uncontrolled thyroid disease, other serious cardiovascular, respiratory, or

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systemic disorder (Motola *et al.*, 2018)

An understanding of the knowledge of the key recommendation is important for developing interventions for influencing and implementing physical activity during pregnancy (SJ de Jersey, JM Nicholson, LK Callaway, LA Daniels, 2013). The purpose of this study is to ascertain the attitude of these women toward physical activity during exercise.

2. METHODOLOGY

The methods described in this section are similar as ones described by (Okori *et al.*, 2022).

Study design.

A cross-sectional quantitative design was used to assess the knowledge of pregnant mothers on antenatal exercise. Every mother who was present at the antenatal clinic during the two weeks of the study, who met the criteria and consents, was asked to respond to a researcher-administered questionnaire.

Study site and settings

The study was carried out from 14th January 2019 to 29th January 2019 in Lira District located in the Lango sub-region in Northern Uganda and is bordered by the districts of Pader and Otuke in the North and North East, Alebtong in the East, Dokolo in the South and Apac in the West. Physically, the district covers approximately a total area of 1326 km² of which 1286.22 km² is a land area with a total population of 408,043 of which 196,663 are males and 211,380 are females (UBOS, 2017).

In the Lira district, the study will specifically be in Lira Regional Referral Hospital (LRRH) which is the biggest Hospital in Lango Sub-region with a 350-bed capacity. It serves a population of about 2.2 million people from its mandated catchment districts of the central north which include Lira, Apac, Dokolo, Amolatar, Oyam, Otuke, Kole, and Alebtong. It is the third youngest regional referral hospital in Uganda after Moroto and Mubende Hospitals. It is located on a 16.34 hectares piece of land along Kitgum Road in Adyel Division in Lira Municipality. The major services offered at the health facility include surgery, gynecology and

obstetrics care, medicine, dentistry, and orthopedics with outpatient services such as immunization, HIV counseling, and testing and elimination of mother-to-child transmission (eMTCT) and antenatal care services. However, in LRRH the research is specifically carried out at the antenatal clinic on pregnant mothers.

Study population

The study population consisted of pregnant mothers attending ANC in Lira Regional Referral Hospital.

Study procedure

The researcher obtained an approval letter from the Lira University Research ethics committee and the Lira Regional Referral Hospital administration and oral permission from the ward in charge was also obtained before the eligible participants were approached for the study. A pilot study was carried out using convenience sampling on a total of five participants from which responses were obtained for one day using the developed questionnaire to enable modification of the tool to make it valid and reliable during the data collection process.

The researcher collected data every Monday to Friday for two weeks using a convenience sampling technique to select the study participants who were around on the day of data collection and consented to the study though everyone in the target group had equal chances of being included in the study and the selected individual study participants were given an interviewer guided questionnaire containing systematically arranged questions in three sections of socio-demographic, knowledge and attitude which are constructed to yield close-ended responses. The participants were reassured of the confidentiality and the interviews were conducted in a private place where no other person could hear the discussion as well as questions from the questionnaire were asked in English and then translated into the local language where necessary by an interpreter. The interview sessions were taking approximately 15 minutes in the antenatal clinic.

ELIGIBILITY CRITERIA

Inclusive criteria

All pregnant mothers of 18-36 weeks of gesta-

tion without pregnancy or medical complications, who were present on the day of the study and provided informed consent to participate in the study, were included.

Exclusive criteria

Pregnant mothers a) with medical or pregnancy complications, b) below 18 weeks of gestation, c) who refused to consent to the study, d) who were disabled, and e) who were medical workers, were excluded from the study.

2.1.

2.1.1. Sample size determination:

The sample size for the study was 152. This number was calculated from the by Kish Leslie formula (1989) for single proportion as below:

$N = (Z)^2 \frac{PQ}{D^2}$, Where **Z** = the Z-score corresponding to 95% confidence interval is 1.96

(D) 2 P= percentage of women who are knowledgeable about PA in Africa, thus P is 47.6%

D=margin of error (+/- 5%)

Q=1-P

$N = (1.96)^2 \times 0.476 \times 0.524$

(0.05)²

N=383

Using the finite population factor for sample size adjustment by Glenn D. Israel 1994

$n = n_0 \times \frac{N}{N + (n_0 - 1)}$

$n_0 = 383$

$n = 383 \times \frac{250}{383 + (250 - 1)}$

$n = 152$

n= 152 participants

Sampling method

The study used a non-probability convenience sampling technique to select participants for the study. Every mother present at the clinic was asked to participate in the study provided they met the inclusion criteria. The sampling method was chosen because the researcher has only two weeks to collect data.

Data collection method and Research instrument

In this research, the data were collected using a researcher-administered questionnaire which had three sections, section one captured socio-

demographic characters of the respondents, section two interrogated the knowledge level regarding PA during pregnancy and section three asked about the attitude of pregnant women toward PA during pregnancy. Closed-ended questions were contained in the questionnaire to generate quantitative data.

Data management

Data entry:

The Questionnaire was filled and check by the researcher to ensure the accuracy and completeness of the information collected. And it was entered using SPSS. SPSS command was made to identify the missing data, check mistakes and make corrections during entry.

3. Data analysis:

Analysis was done with the help of SPSS which will provide descriptive statistics (mean, percentage, frequency, etc.) on knowledge of PA during pregnancy. A chi-square analysis was used to make inferences about the levels of various components of physical activity in pregnant mothers.

Measurements of variables

The dependent variable of the study is physical activity during pregnancy while independent variables to be measured include knowledge of physical activity during pregnancy was measured through questionnaire responses to specific questions.

The mother's knowledge was measured via twenty-six specific questions which ask whether they heard about PA during pregnancy, how frequently they exercise, the duration of exercise, the types of exercise, and the benefits and contraindications of PA during pregnancy. Each response was given a score of one for correct answer and a zero score for incorrect answer then scores are summed for each respondent out of a total number of eleven selected questions asked and expressed as a percentage.

The percentage score obtained from the scores was graded and those respondents who scored 50% -100% are regarded as adequate knowledge and 0-49% had poor knowledge

Quality control

Validity and reliability

The questionnaire was checked by experts including my supervisor lecturer, who assessed external and contented validity.

A pilot study was carried out using convenience sampling on a total of five participants from which responses were obtained for one day using the developed questionnaire to enable modification of the tool to make it valid and reliable.

Before data collection, the questionnaire was pretested among five antenatal mothers to check for adequacy of questions in terms of wording, clarity, and ambiguity before use in the actual study. Pre-coding and categorization of data were done for quality data to be collected.

Ethical consideration

Approval

Ethical approval for the study was obtained from Lira University Research and Ethics committee (LUREC) and permission was sought from Lira Regional Referral Hospital administration including the in-charge of the antenatal clinic.

Consent:

A document containing the purpose of the research, the benefits of the research, the risks, and the rights of the participants was read to all respondents. They were asked to consent to the study after they have acknowledged that they understood and agreed to participate in the study. They consented by signing and or inserting a thumbprint.

Privacy protection:

Interviews took place in a private place where other people couldn't interrupt or hear what is being discussed and data was entered into SPSS and secured using a password.

Confidentiality:

Participants' initials were used instead of their full name to shield their identity and information that was given by the participants were not disclosed to any other person

4. RESULTS

Socio-demographic characteristics.

Socio-demographic characteristics of mothers were assessed via 9 specific questions which were

administered by a researcher 152 mothers responded to those questions, 73.3% of them belonged to the age group 15-29 and 23.7% were 30 years and above. 60.5% of the participants were in between 18-29 weeks of gestation, and 39.5% of them were in between 21 to 40 weeks of gestation. The majority 85.5% of the respondents were Lango, and 14.5% were from other tribes like; Acholi, Buganda, and Itesots. 57.9% were residing in town and 42.1% were living in the villages. 94.1% of the respondents were Christians, and 5.9% were Islam. 82.9% of respondents were married, and 17.1% of them were not married. 36.8% of respondents studied up to the primary level, and 63.2% studied up to the secondary level and above. 39.5% were employed while 76 were not employed also. 81.6% were getting a monthly income of ranges 1 to 200000 Uganda shillings and 18.4% were getting above 200000 Uganda shillings. More details are as described in table 1 of the study by (Okori *et al.*, 2022).

KNOWLEDGE OF MOTHERS ABOUT PHYSICAL ACTIVITY DURING PREGNANCY

Prior information about physical activity during pregnancy

Mothers were asked five questions to ascertain if they had received information regarding physical activity during pregnancy before the interview. The questions also probed the nature of the information they had received. Ninety mothers answered these questions. The questions and the responses are presented in Table 2. Approximately 59% of mothers reported that they had prior information about physical activity during pregnancy and ~ 41% said they had no prior information. The majority (66%) of those who had information reported that they got the information from the health unit; others had obtained information from the internet (10%), TV and radio (8%), friends and family (4%) and from many places (12%). Approximately 22% of women who had information about PA during pregnancy obtained the information before pregnancy, 43% during pregnancy, and 34% both during and before pregnancy. The majority of mothers (87%) were told that PA during pregnancy was good and

Table 1: Showing socio-demographic characteristics of participants.

VARIABLE	FREQUENCY	PERCENT
Age group		
15-29	116	76.30%
30 and above	36	23.70%
Gestational weeks		
18-29	92	60.50%
30 and above	60	39.50%
Tribe		
Lango	130	85.50%
Others	22	14.50%
Residence		
Urban	88	57.90%
Rural	64	42.10%
Religion		
Christians	143	94.10%
Muslims	9	5.90%
Marital status		
Married	126	82.90%
not married	26	17.10%
Educational level		
below secondary	56	36.80%
secondary and above	96	63.20%
Occupation		
Employed	76	50.00%
not employed	76	50.00%
Monthly income		
Ugx 200,000 and below	124	81.60%
Above Ugx. 200,000	28	18.40%

only 13% were told it is bad. The reasons given for PA being bad were, a) it causes harm to the fetus 17%, b) it causes harm to the mother 8%, c) it can cause a miscarriage 33%, and d) all the above statements 58%.

Mother's response about the benefits of physical activity during pregnancy

Mothers were asked 12 Yes/No questions to ascertain their knowledge of the benefits of physical activity. The questions and the responses are shown in Table 3.

73% of mothers said PA reduces back pain, 43% said it reduces the risk of urinary incontinence, 62% said it decreases the risk of DM, 56% said it strengthens pelvic floor exercise, 37% said it

decreases the formation of varicose vein, 65% reported that it decreases the risk of swelling of extremities, 57% of them reported that it increases muscle tone strength and endurance, 66% said it increases energy and stamina during pregnancy, 57% said it improves mental alertness, posture, and coordination, 72% said it improves the ability to cope with labor and delivery, 56% said it is associated with rapid post-natal recovery.

Knowledge of the benefits of physical activity during pregnancy.

Mothers were asked 8 selected questions to assess the knowledge level of mothers of PA, a correct response was given a score of 1(one) and the incorrect response was given a score of 0(zero),

Table 2: showing mothers prior knowledge on physical activity during pregnancy

VARIABLE	RESPONSE	FRE- QUENCY	PERCENT- AGE
Have you heard of physical activity	Yes	90	59.20%
	No	62	40.80%
if yes where did you hear it from	TV and radio stations	7	7.80%
	Internet	9	10%
	Health unit	59	65.60%
	Friends and family	4	4.40%
	Books and magazines	11	12.20%
when did you hear it	before pregnancy	20	22.20%
	after pregnancy	39	43.30%
	Both	31	34.40%
did they say it is bad or good	Good	78	86.70%
	Bad	12	13.30%
if bad what was the reason	It causes harm to the fetus	2	16.70%
	It causes harm to the mother	1	8.30%
	It can cause a miscarriage	4	33.30%
	All the above	7	58.30%

a total number of scores were summed and converted to percentages, those who scored 50% and above were considered having adequate knowledge and those who were having a score below 50% were considered having poor knowledge. The knowledge level is shown in figure 1 below.

55.3% of the mothers who participated in the study had poor knowledge of the benefits of physical activity during pregnancy, while 44.7% had satisfactory knowledge about the benefits of PA during pregnancy. Again briefly explain how you calculated these percentages.

Mother's knowledge of contraindications of physical activity during pregnancy

Mothers' knowledge of contraindications was assessed via 9 questions which were asked to probe their knowledge of the contraindications of PA during pregnancy and their response is presented in table 4.

80% of participants said pregnant mothers are supposed to stop physical activity when there is vaginal bleeding, 70% said when there is chest pain, 77% said when breathing is difficult, 72% said when there is abdominal pain, 56% when there is extreme weight loss, 73% said when there is premature labor, 60% said when there is back pain, 70% said when there is muscle weakness, and 73% said when there is migraine headache they have to stop physical activity when they are pregnant.

When to stop physical activity during pregnancy

Seven specific questions were selected from the question used to assess mother's knowledge of contraindications of PA during pregnancy, they were given a score of one for every correct response and zero for an incorrect response the sum of the correct response was got and converted to

Table 3: Show mothers response about the benefits/importance of PA during pregnancy.

VARIABLE	RE- SPONSE	FRE- QUENCY	PERCENT- AGES
PA reduces back pain	Yes	111	73.00%
	No	41	27.00%
PA reduces risk of urinary incontinence	Yes	65	42.80%
	No	87	57.20%
PA decreases the risk of DM	Yes	94	61.80%
	No	58	38.20%
PA strengthen pelvic floor muscle	Yes	85	55.90%
	No	67	44.10%
PA decreases the formation of varicose vein	yes	56	36.80%
	No	96	63.20%
PA decreases the risk of swelling of extremities	Yes	98	64.50%
	No	54	35.50%
PA reduces the risk of high blood pressure	Yes	122	80.30%
	No	30	19.70%
PA increases muscle tone, strength and endurance	Yes	87	57.20%
	No	65	42.80%
PA increases energy and stamina	Yes	100	65.80%
	No	52	34.20%
PA improves mental alertness, posture and coordination	Yes	86	56.60%
	No	66	43.40%
PA improves ability to cope with labor and delivery	Yes	109	71.70%
	No	43	28.30%
PA brings more rapid postnatal recovery	Yes	85	55.90%
	No	67	44.10%

percent for every mother who responded to the questions. Mothers who score 50% and above were considered to have adequate knowledge of the contraindication of PA during pregnancy and those with scores less than 50% were considered to have poor knowledge about the contraindication of PA during pregnancy and the results are shown in the figure 2.

49.3% of mothers have high knowledge of when to stop physical activity during pregnancy, and 50.7% had a low level of when to stop PA during pregnancy.

Mother's response on conditions that would warrant starting PA during preg-

nancy

Five questions were asked to probe the conditions that would warrant starting PA during pregnancy and the results are presented in the table below

61% of respondents said they would start PA when they experience extreme weight gain, 53% said they experience signs of DM, 38% of them said they would start when there is dizziness, 47% said they have to start it when there is swelling of extremities and 38% said they have to start when there is the uterine contraction.

Knowledge about when to start physical activity during pregnancy

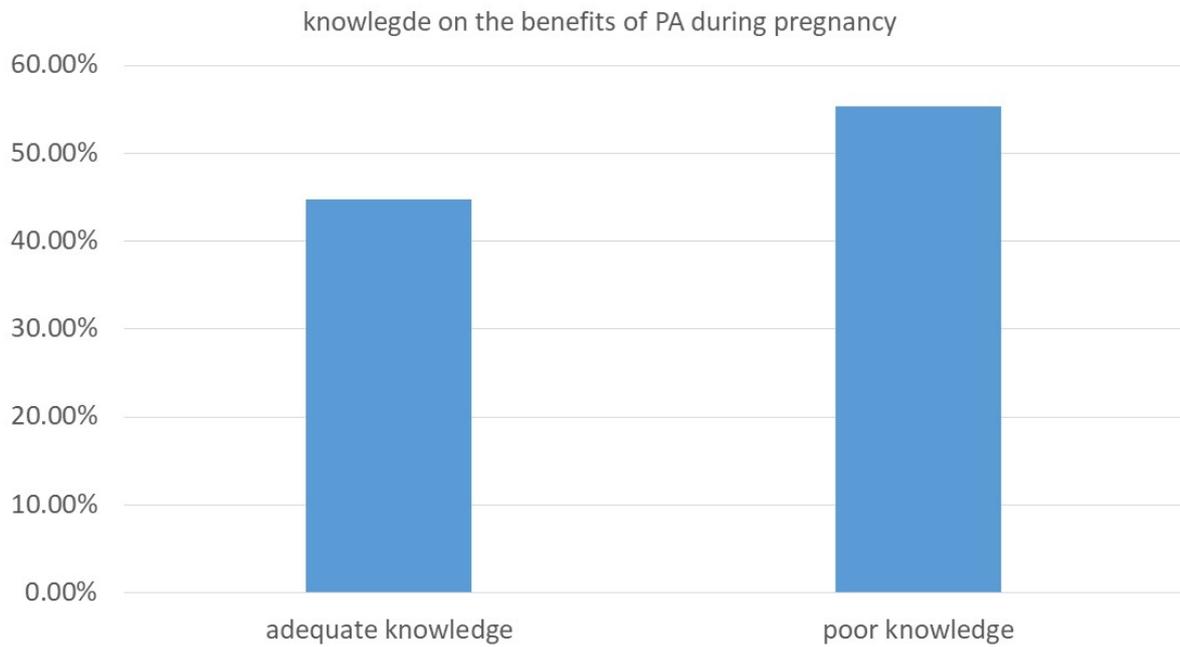


Figure 1: Shows the knowledge of the benefits of PA during pregnancy.

Table 4: showing mothers response on the contraindications of PA during pregnancy

VARIABLE	RESONSE	FREQUENCY	PERCENT
Vaginal bleeding	Yes	122	80.30%
	No	30	19.70%
Chest pain	Yes	106	69.70%
	No	46	30.30%
Difficulty in breathing	Yes	117	77%
	No	35	23%
Abdominal pain	Yes	109	71.70%
	No	43	28.30%
Extreme weight loss	Yes	85	55.90%
	No	67	44.10%
Premature labor	Yes	111	73%
	No	42	27%
Back pain	Yes	91	59.90%
	No	61	40.10%
Muscle weakness	Yes	106	69.70%
	No	46	30.30%
Migraine headache	Yes	111	73%
	No	41	27%

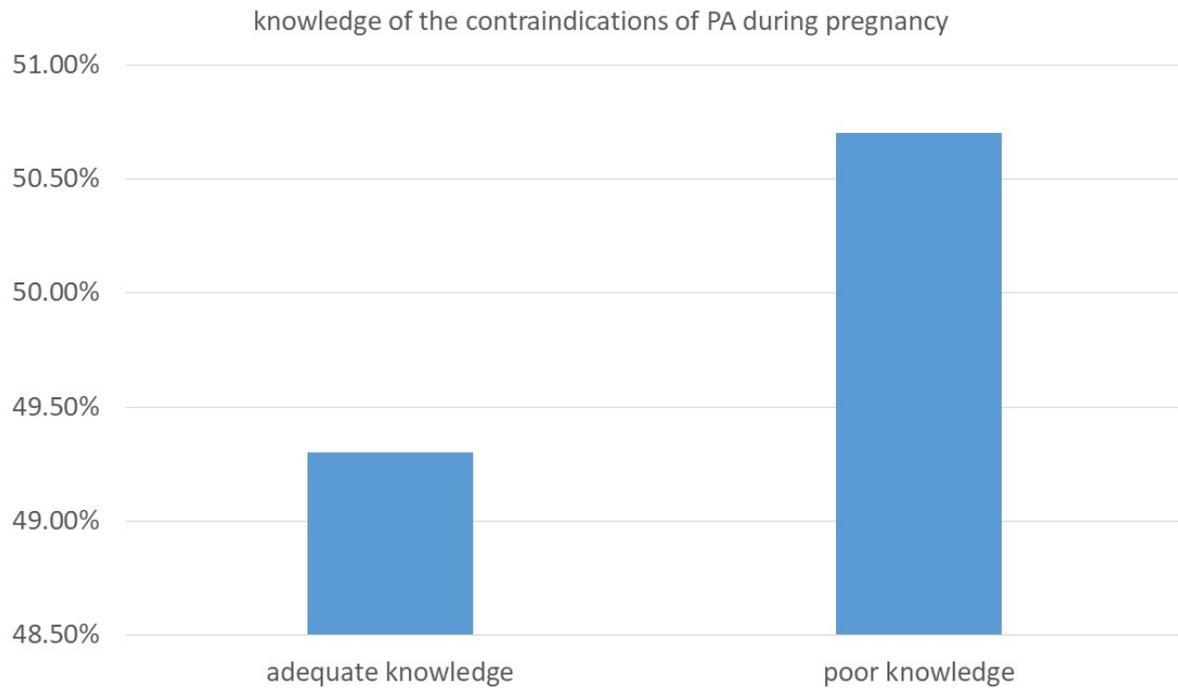


Figure 2: Shows the knowledge of contraindications of PA during pregnancy

Table 5: showing conditions that would warrant starting physical activity during pregnancy

CONDITIONS	RESPONSE	FREQUENCY	PERCENT
Signs of DM	Yes	80	52.60%
	No	72	47.40%
Extreme weight gain	Yes	93	61.20%
	No	59	38.80%
Feeling dizzy	Yes	58	38.20%
	No	94	61.80%
Swelling of extremities	Yes	72	47.40%
	No	80	52.60%
Uterine contraction	Yes	58	38.20%
	No	94	61.80%

Five questions were asked to assess knowledge of conditions that would warrant starting PA during pregnancy were given a score of one for every correct response, and a score of zero for every incorrect response, total score was got and converted into a percentage, mothers who scored below 50% were considered having poor knowledge and those who scored 50% and above were considered having adequate knowledge.

44.5% of the participants had adequate knowledge of conditions that would warrant starting physical activity during pregnancy, and 54.6 % had low knowledge of when to start PA when they are pregnant.

General knowledge about pa during pregnancy

The overall knowledge of physical activity was determined using the knowledge about the ben-

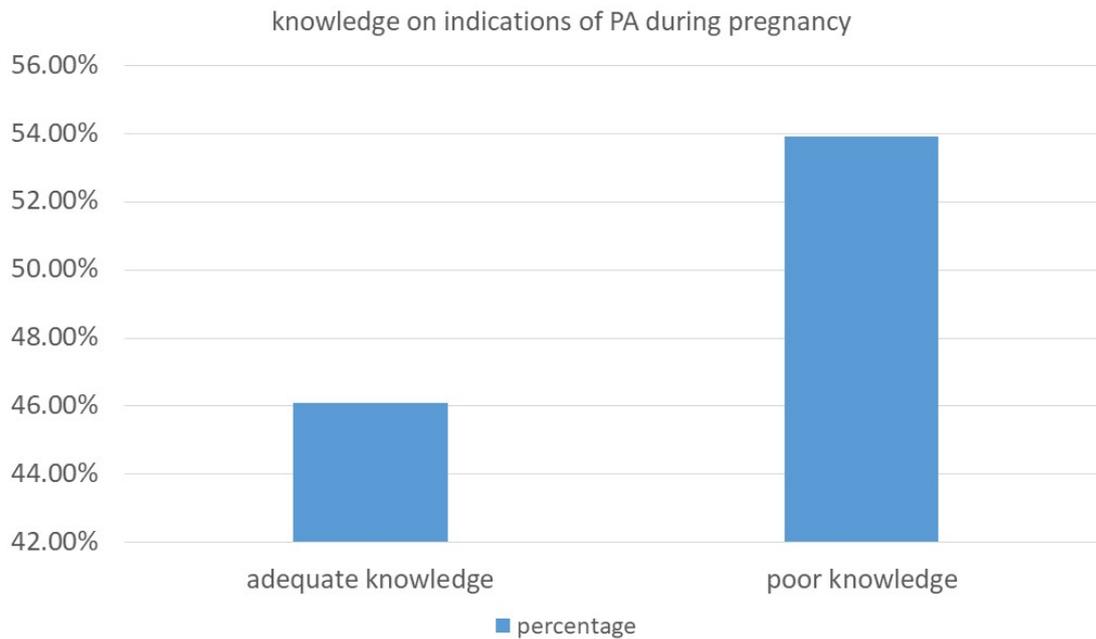


Figure 3: about condition that would warrant starting physical activity during pregnancy

efits, knowledge of the contraindications, and knowledge on the conditions that would warrant starting PA during pregnancy. The average percentage of those with adequate knowledge was got to determine those with adequate knowledge of PA during pregnancy and also, and the average percentage of those who are having poor knowledge was got to determine those with poor knowledge.

53.9% of respondents were having poor knowledge about physical activity during pregnancy, and 46.1% were having adequate knowledge about physical activity during pregnancy

Association between socio-demographic characteristics and knowledge of pregnant mothers about physical activity during pregnancy

As shown in the table 6 a chi-square analysis revealed a significant association between knowledge about physical activity and: gestational weeks and level of education; mothers with gestational weeks of below 30 are more likely to have higher (55.4%) knowledge about physical activ-

ity during pregnancy as compared to mothers of 30 and above weeks of gestation [$\chi^2(1) = 8.258a$; $p < 0.007$]. Mothers who attained up to the secondary level of education and above are having higher knowledge (54.2%) of PA during pregnancy than those who didn't attain a secondary level of education [$\chi^2(1) = 6.905a$; $p < 0.014$]

5. DISCUSSION:

Our finding that only 46% of the participants had adequate overall knowledge of PA during pregnancy is consistent with findings from other countries: A cross-sectional study in Nigeria among 189 pregnant women from six selected antenatal clinics in Ile-Ife, South-West, Nigeria revealed that 46.6% had good knowledge of antenatal exercises. Please note that in their study, they computed the percentage of mothers with good or average knowledge by giving a score of 1 for correct responses (to questions related to the types, contraindications, and benefits of antenatal exercises) and 0 for incorrect responses. The sum of the scores was computed and a score of

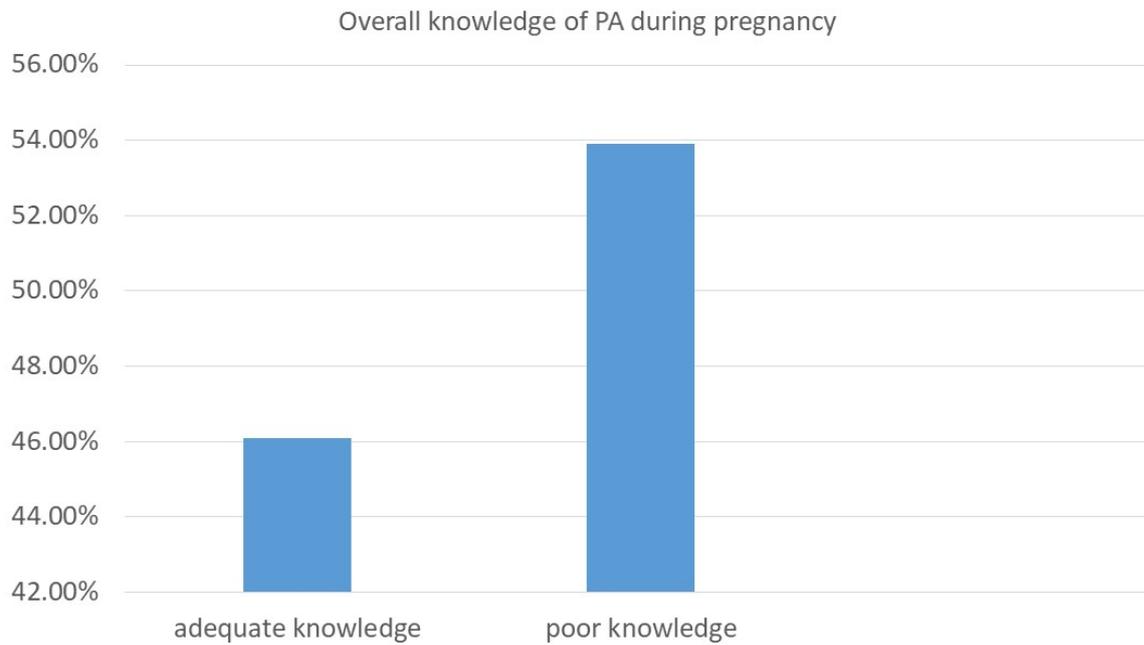


Figure 4: showing the overall knowledge of PA during pregnancy

Table 6: Indicating the association between social demographic characteristics and knowledge of mothers about PA during pregnancy.

Variable	Knowledge about physical activity during pregnancy		Pearson chi-square value	p-value
	Adequate knowledge	Poor knowledge		
Age				
15-19	47%	53%	0.049 ^a	0.979
30 and above	44%	56%		
Gestational weeks				
18-29	55%	45%	8.258 ^a	0.007
30 and above	32%	68%		
Religion				
Christian	48%	52%	2.187 ^a	0.257
Muslims	22%	78%		
Education level				
below secondary	32%	68%	6.905 ^a	0.014
secondary and above	54%	46%		
Employment status				
Employed	53%	47%	2.648 ^a	0.143
not employed	40%	60%		

60 and above was branded as good knowledge. However, in our study, a question related to benefits and contraindications but not types of exercises were asked and were scored similarly to theirs but a score of 50 and above was categorized as adequate. Therefore, the percentages reported in the two studies should be compared with caution. Our results indicate that there is a need to improve knowledge of PA in pregnancy. Other studies from different nations reveal different levels of knowledge regarding antenatal exercises. A study done in Brazil demonstrated good knowledge of exercise during pregnancy (Milanez, 2011). Knowledge of South Indian women on exercise during pregnancy was found to be less than average (Sujindra *et al.*, 2015).

The level of knowledge by pregnant women appears to be dependent on many factors (Evenson *et al.*, 2004). In our study, we found that it was associated with gestational weeks and the level of education of mothers. It is not surprising that knowledge of antenatal exercises increases with gestational age because most women attend ANC where they are informed of the importance and benefits of antenatal exercises. Regarding the association of knowledge with educational level, our finding is consistent with numerous reports from other countries. The high knowledge of Saudi, Ile-Ife, Nigeria and Brazilian women on antenatal exercises was all reported to be due to their high level of education (Mbada *et al.*, 2014; Milanez, 2011). In our study, 63.5% had also attained some level of education (beyond the primary level).

Our study revealed that mothers get information on antenatal exercises from health units (66%) Internet (10%), and radios & TV stations (8%). Mothers were aware that PA reduces swelling of extremities, back pain, and hypertension and promotes better ability to cope with labor and delivery. However, it appears that the effects of exercise on reducing the risk of incontinence and formation of the varicose vein are not availed to them. Moreover, some women incorrectly associated back pain as a contraindication for PA. Health educators at health clinics and on radio & TV should be empowered to give pregnant mothers more comprehensive informa-

tion about the benefits and contraindications of PA. This information can be found in the guidelines of the American College of Obstetrics and Gynecology (ACOG, 2012). In this document, other contraindications of PA during pregnancy are stated. And they are hemodynamically significant heart disease, restrictive lung disease, incompetent cervix, multiple gestations at risk for premature labor, placenta Previa after 26 weeks gestation, ruptured membranes, severe anemia, unevaluated maternal cardiac arrhythmia, chronic bronchitis, poorly controlled type I diabetes, extreme morbid obesity, extreme underweight, intrauterine growth restriction in the current pregnancy, poorly controlled seizure disorder, poorly controlled thyroid disease, heavy smoker (ACOG, 2012).

6. CONCLUSION

The knowledge about Physical activity during pregnancy is generally limited and, in this study, it was associated with the level of education and gestational age. Educated mothers were fairly knowledgeable about the benefits, and contraindications. And mothers with increasing gestational age also had favorable knowledge of PA in pregnancy. There is a need to enrich the community with knowledge about physical activity in pregnancy and can be done through; a) providing a written document to mothers who can read and understand, b) health workers attending to pregnant mothers in antenatal clinics should give a complete and evidence-based health education talks.

The majority of participants had a positive attitude towards physical activity during pregnancy and it was associated with gestational age and influenced by lack of information about PA in pregnancy, the number of children they had to care for, a busy schedule, and fear of PA. Women with negative attitudes need to be encouraged by medical workers, family members, and friends, through a conference, radio, and TV talk shows such that they develop a good attitude toward PA during pregnancy since it is recommended by various bodies that it is good for the good health of

pregnant mothers.

RECOMMENDATION

Based on the findings that, women in this study didn't have comprehensive knowledge about PA during pregnancy, health care providers should be empowered to counsel healthy and fit pregnant women with a comprehensive, evidence-based prenatal exercise guideline on the safety of involvement in PA during pregnancy (Wolfe & Weissgerber, 2003). This information should be incorporated from various guidelines of PA in pregnancy such as the American college of obstetrics and gynecology guidelines.

Since most mothers get their information on PA in pregnancy from health facilities during their antenatal visits, the guideline of PA should be integrated with routine antenatal care such that women can easily adopt it as a necessity rather than an option in pregnancy. This can be achieved by integrating PA in pregnancy as an important topic for health education talks during antenatal visits. Pregnant women should be encouraged to book early for antenatal care to get information about PA early enough to reap optimal benefits. Early booking gives this opportunity of starting early in pregnancy and adhering for a long time.

Based on the findings that some small percentages had a negative attitude towards PA in pregnancy, health educators should be encouraged to avail the information to the community members, this will enable the community to develop good feelings towards antenatal exercises. Pregnant women should be encouraged to form exercise groups in their communities so they provide moral support for each other.

Based on findings from other studies that there is a low practice of PA in pregnancy, further studies should be done in Uganda to come up with the prevalence of PA during pregnancy in Uganda

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8. LIST OF ABBREVIATIONS.

ACOG: American College of Obstetrician and Gynecologist

ACSM: American College of Sports Medicine

ANC: Antenatal Care

eMTCT: elimination of mother to child transmission

GDM: Gestational Diabetes Mellitus

LRRH: Lira Regional Referral Hospital

LUREC: Lira University Research Ethics Committees

MoH: Ministry of Health

PA: Physical activity

RCOG: Royal College Obstetrician Gynecologist

SPSS: Statistical Package for Social Scientists

UBOS: Uganda bureau of statistics

UCG: Uganda clinical guidelines

UK: United Kingdom

WHO: World Health Organization

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CONFLICT OF INTEREST.

None

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