

# Knowledge, attitudes and practices regarding antenatal exercises among pregnant mothers attending De Soyza Maternity Hospital Colombo

Wijesiriwardana W S, Gunawardena N S

## Abstract

**Key Words:** Pregnancy, Antenatal exercises, Knowledge, Attitudes.

**Introduction:** Antenatal exercises provide many health benefits not only to pregnant mothers but also to the fetuses. Adequate knowledge among pregnant mothers is vital to promote practicing of it. The aim of this study was to describe the knowledge, attitudes and practices regarding antenatal exercises and factors associated with them among pregnant women attending De Soyza Maternity Hospital (DMH) Colombo.

**Methods:** A descriptive cross-sectional study was conducted among 110 pregnant mothers with a period of amenorrhoea of 20 weeks or more using an interviewer-administered questionnaire.

**Results:** Knowledge regarding antenatal exercises was 'poor' among a majority (72.7%, n=80). Only 6.4% (n=7) and 5.5% (n=6) knew the importance of pelvic floor strengthening exercises and its technique, respectively. Most had somewhat favourable (49.1%, n=54) and favourable (35.5%, n=39) attitudes towards antenatal exercises while overall practices were 'poor' with a majority not exercising (86.4%, n=95). The sources of information were written media (49.1%, n =54) and electronic media (48.2%, n=53). Doing a job during pregnancy was significantly associated with possessing a 'Good/Excellent' level of knowledge ( $p=0.02$ ) while living in a district other than Colombo was also associated significantly with a 'Good/Excellent' level of knowledge ( $p=0.039$ ) and a 'Good' level of practice ( $p=0.042$ ). Average family monthly income of > Rs. 25000 was associated with a level of 'Favorable' attitude ( $p=0.004$ ).

**Conclusion:** Knowledge and practices regarding antenatal exercises among pregnant women attending DMH were suboptimal while their attitudes were mostly favourable. Measures should be taken to improve knowledge and practices of antenatal exercises during pregnancy.

## INTRODUCTION

Antenatal exercises provide many health benefits to pregnant mothers and their foetuses. Specific exercises and postures can help the pregnant woman to adapt to the physical changes in her body during child bearing<sup>1-6</sup> the latest 9 years ago. These guidelines recommend 30 minutes or more of moderate exercise on most if not all days of the week for pregnant women in the absence of medical or obstetric complications. However, moderate-intensity exercise was not defined. In addition, the specific weekly energy

expenditure of physical activity was not suggested. Recent research has determined that, compared with less vigorous activities, exercise intensity that reaches at least 60% of the heart rate reserve during pregnancy while gradually increasing physical-activity energy expenditure reduces the risk of gestational diabetes. To achieve the minimum expenditure of 16 metabolic equivalent task-h/wk, one could walk at 2 miles/h for 6.4 h/wk (2.5 metabolic equivalent task-hours, light intensity). Avoiding many pregnancy related complications including, gestational diabetes mellitus (GDM), bladder, bowel problems, back pain, fatigue, weakness of the muscles of the abdomen, obesity and varicose veins and experiencing shorter labour and reduction of difficulties associated with delivery have been identified as some of the benefits

which contribute to the good health of the mother and the baby<sup>1</sup>. It has also been shown that pregnant women can gain extra benefit from strengthening back muscles, abdominal muscles and pelvic floor muscles. Strengthening abdominal muscles helps to reduce the effect of strain during pregnancy. Strengthening pelvic floor muscles permits the vagina to widen more easily during child birth. Moreover, it helps to prevent urinary incontinence during and after the pregnancy. Strengthening the back muscles and improving the postures minimize the strain during pregnancy on the lower back. Foot and leg exercises should be advised to improve circulation and prevent further complications<sup>1-4,6-8</sup> the latest 9 years ago. These guidelines recommend 30 minutes or more of moderate exercise on most if not all days of the week for pregnant women in the absence of medical or obstetric complications. However, moderate-intensity exercise was not defined. In addition, the specific weekly energy expenditure of physical activity was not suggested. Recent research has determined that, compared with less vigorous activities, exercise intensity that reaches at least 60% of the heart rate reserve during pregnancy while gradually increasing physical-activity energy expenditure reduces the risk of gestational diabetes. To achieve the minimum expenditure of 16 metabolic equivalent task-h/wk, one could walk at 2 miles/h for 6.4 h/wk (2.5 metabolic equivalent task-hours, light intensity).

Though most women who are in good health can participate in physical exercises and other forms of physical activities safely during their pregnancy, women are encouraged to perform physical exercises according to medical recommendations<sup>5</sup>.

Accurate and appropriate knowledge and favourable attitudes regarding antenatal exercises among pregnant mothers has been shown to be vital in promoting

University of Colombo, Sri Lanka

Correspondence: Wijesiriwardana W S

E-mail: wageeshawijesiriwardana@gmail.com

Competing interests: None

practice of exercises<sup>6,9</sup>. Understanding of the existing knowledge about antenatal exercises among pregnant mothers as well as an insight into attitude regarding antenatal exercises in the context of socio-cultural, educational and economic background of the pregnant mothers is imperative in designing any educational intervention to promote antenatal exercises.

The aim of this study was to describe the knowledge, attitudes, practices and information sources regarding antenatal exercises and their relationship with the socio-demographic and pregnancy related characteristics among pregnant women attending De Soyza Maternity Hospital (DMH) Colombo.

## METHODS

A descriptive cross-sectional study was carried out among 110 pregnant mothers. Pregnant mothers fulfilling inclusion criteria of having completed 20 weeks or more of period of amenorrhea (POA) were recruited while pregnant mothers who have been medically advised to bed rest or minimize physical activity during pregnancy were excluded from the study. Eligible study units were recruited consecutively using convenient sampling method among pregnant mothers waiting for care from all the antenatal clinics of the DMH. Mothers were approached and invited to participate in the study by explaining the objectives and obtaining informed written consent. Data were collected using an interviewer administered questionnaire developed and pre-tested by the principal investigator. The content of the questionnaire was based on the recommendations of antenatal exercises by American College of Obstetrics and Gynecologists and other literature reviewed. The questions assessing knowledge and practices were assigned scores and using a predetermined cut-off, pregnant mothers were categorized into 'excellent', 'good' and 'poor' levels of overall knowledge and overall practices regarding antenatal exercises. The pregnant mothers were categorized into three levels based on their overall attitudes. Responses to each attitudinal statement were assigned a score with those with

favorable attitudes being assigned a higher score. Considering the scores for all attitudinal statements the pregnant mothers were categorized into having 'favourable'/somewhat 'favourable' and 'unfavourable' attitudes regarding antenatal exercises. In assessing socio-demographic and pregnancy related characteristics associated with overall knowledge and overall practices related to antenatal exercises, the three categories of overall knowledge and practices were amalgamated into two levels as 'poor' and 'good'/'excellent'. The three levels of overall attitudes were categorized into two as 'unfavourable' and 'somewhat favourable'/favourable'. Cross tabulated results were assessed for significant their associations using the chi square test. A p value of 0.05 was used to determine the significance.

Several relevant healthcare professionals who had expertise of the field reviewed and confirmed the content validity and format of the questionnaire, the scoring systems and cut-offs used. Ethical clearance was obtained from the ethics review committee of the Faculty of Medicine, University of Colombo, Sri Lanka.

## RESULTS

The response rate was 91.7% (110/120). Most of the mothers were in

the age category of 26-30 years while 30.9% (n=34) were less than 26 years old. A great majority (80.9%, n=89) of the population was housewives. Most indicated that they were educated up to grade 6-11 (57.3%, n=63). A majority (40.9%, n=40) was Buddhists while 33.6% (n=42) were Muslims and 25.5% (n=28) of the population were Christians. Approximately half (47.3%, n=52) of pregnant mothers were resident out of Colombo district and a majority (61.8%, n=6) was living with extended family.

A majority of the pregnant mothers were multiparous (62.72%, n=69) with 61.81% (n=68) having living children. Approximately half 50.9% (n=56) of the pregnant mothers, were in the POA category of 31-40 weeks.

On inquiry it revealed that, approximately half of the pregnant mothers (51.8 %, n=57) had been recommended to perform antenatal exercises during the current pregnancy. A majority of the pregnant mothers (48.2%, n=53) have been recommended to perform walking as an exercise while 30.9% (n=34) of pregnant mothers have been recommended to perform exercises to ankles and toes.

Results of the assessment of knowledge on antenatal exercises are shown in Table 1.

**Table 1: Distribution of mothers who demonstrated accurate knowledge regarding different aspects of antenatal exercises**

Aspects of antenatal exercises assessed	No.	%
Contraindications for exercises during pregnancy	39	35.5
Precautions for exercises during pregnancy	92	83.6
Recommended frequency of exercises during pregnancy	30	27.3
Correct posture of standing during pregnancy.	36	32.7
Importance of performing breathing exercises	57	51.8
Importance of ankles/toes exercises to reduce swelling in ankles	83	75.5
Importance of ankles/toes exercises to prevent varicose veins during pregnancy	41	37.3
Importance of pelvic floor strengthening exercises	7	6.4
Importance of pelvic floor strengthening exercises doing before and after the pregnancy	5	4.5
Importance of abdominal muscles strengthening exercise	17	15.5
Technique of performing pelvic floor strengthening exercises	6	5.5
Technique of abdominal muscles strengthening exercise	4	3.6
Technique of performing breathing exercises	38	34.5
Technique of performing relaxation exercise	13	11.8

Only 27.3% (n=30) of pregnant mothers knew the recommended frequency of antenatal exercises as performing daily or at least 3 days a week to get the expected health benefits. Though a majority of pregnant mothers (75.5%, n=83) knew the importance of exercises for ankles and toes during pregnancy as maintaining good circulation and reducing the swelling in the legs, only 37.3% (n=41) knew the importance of performing the same exercise to prevent varicose veins during pregnancy. Only

6.4% (n=7) knew the importance of pelvic floor strengthening exercises as helping to avoid occurrence of uncontrollable leakage of urine when laughing or sneezing. A minority (5.5%, n=6) knew the technique of pelvic floor strengthening exercises as tightening the muscles around the vaginal and urethral opening as we are trying to hold the need of defecation and urination. Only 4.5% (n=5) of the pregnant mothers knew the importance of doing this exercise before, during and after the pregnancy.

The sources of information of pregnant mothers on antenatal exercises was inquired into and results showed that they were mostly written media (49.1%, n =54) and electronic media (48.2%, n=53). Midwives (40.9%, n=45) and nurses (37.3%, n=41) had also contributed.

Table 2 shows the attitudes of pregnant mothers regarding performing antenatal exercises.

The statement "Though the recommended exercises make labour easy, it may also harm to baby in some

**Table 2: Distribution of mothers by their attitudes regarding antenatal exercise**

Attitudes regarding antenatal exercise	Strongly agree		Agree		Uncertain		Disagree		Strongly disagree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Whether a pregnant woman does the recommended antenatal exercises during pregnancy or not, will not affect labour	4	3.6	18	16.4	7	6.4	40	36.4	41	37.3
Though the recommended exercises make the labour easy, it may also harm to the baby in some way.	5	4.5	14	12.7	11	10	44	40.0	36	32.7
Pregnant mothers performing physical exercises does not suit our culture	5	4.5	7	6.4	8	7.3	47	42.7	43	39.1
Any pregnant mother can perform exercises without the advices and recommendations of healthcare professionals	5	4.5	17	15.5	5	4.5	33	30	50	45.5
During pregnancy the priority should be improvement of nutrition and the rest and not physical exercises	2	1.8	14	12.7	8	7.3	49	44.5	37	33.6
Performing day to day household activities gives adequate physical exercises to pregnant women and they do not have to perform recommended exercises during pregnancy	17	15.5	22	20	7	6.4	44	40	20	18.2

way" was disagreed by 40% (n=44) and strongly disagreed by 32.7% (n=36) of the mothers. Responses to the attitudinal statement "Performing day to day household activities gives adequate physical exercises to pregnant women and they do not have to perform recommended exercises during pregnancy" was disagreed by 40.0% (n=44) and strongly disagreed by 18.2% (n=20).

Results of the assessment of performance of antenatal exercises are shown in Table 3.

Only 45.5% (n=50) of pregnant mothers were doing 'walking' as an exercise more than three times a week. Only about one fourth (23.6%, n=26) of pregnant mothers were practicing

**Table 3: Distribution of mothers by whether they perform exercise**

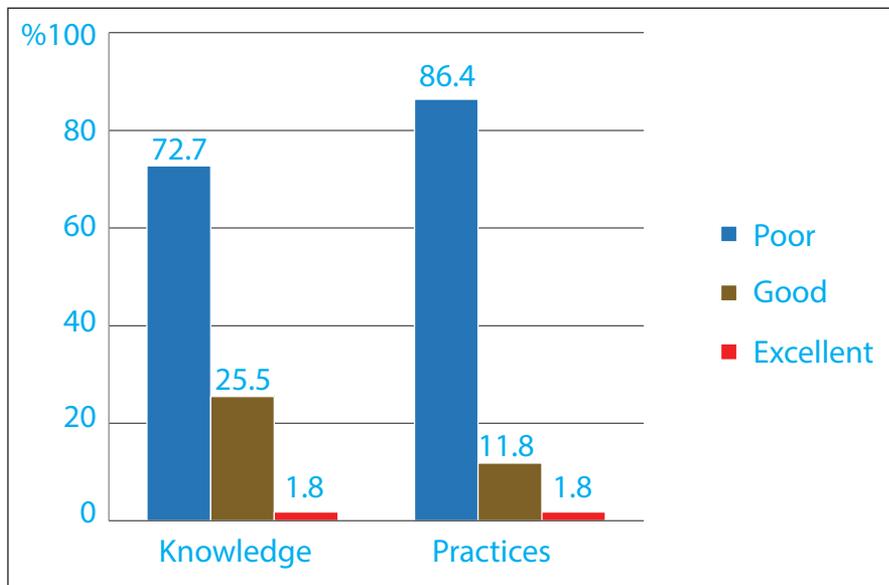
Performing exercises	Performing more than 3 times a week		Performing less than 3 times a week or not at all	
	No.	%	No.	%
Walking	50	45.5	24	21.8
Ankle, toe exercises	26	23.6	63	57.3
Abdominal strengthening exercises	1	0.9	105	95.5
Pelvic floor strengthening exercises	5	4.5	102	92.7
Breathing exercises	19	17.3	81	73.6
Relaxation exercises	6	5.5	96	87.3

exercise for ankles and toes and 17.3% (n=19) were practicing breathing exercise more than three times a week. Pelvic floor muscle strengthening exercises were performed more than

three times a week only by 4.5% (n=5) of pregnant mothers. The least performed exercises among pregnant mothers was abdominal strengthening exercise (0.9%, n=1).

Figure 1 shows the distribution of pregnant mothers by the overall knowledge and practices related to antenatal exercises.

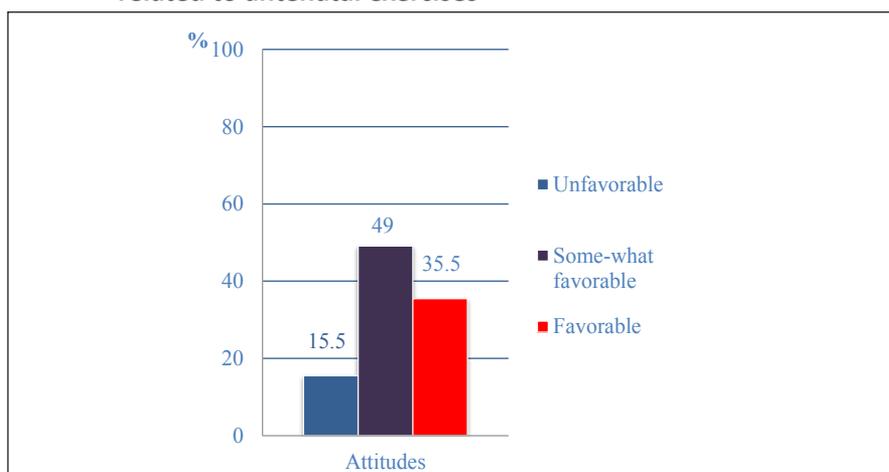
**Figure 1: Distribution of pregnant mothers by the overall knowledge and practices related to antenatal exercises**



A majority of pregnant mothers had ‘poor’ overall knowledge on antenatal exercises (72.7%, n=80). Overall practices were mostly ‘poor’ (86.4%, n=95) with a majority not performing recommended exercises.

Overall attitudes regarding antenatal exercises among pregnant mothers are shown in Figure 2.

**Figure 2: Distribution of pregnant mothers by the overall attitudes related to antenatal exercises**



Most of pregnant mothers (49%, n=54) were categorised as having ‘some-what favorable’ overall attitudes towards antenatal exercises while 35.5% (n=39) of pregnant mothers were having ‘favourable’ overall attitudes.

Association of socio-demographic and pregnancy related characteristics and overall knowledge (Table 4), overall attitudes (Table 5) and overall practices (Table 6) regarding antenatal exercises among pregnant mothers are shown below.

**DISCUSSION**

Literature review revealed a few studies which have assessed knowledge on antenatal exercise in other countries<sup>6-9</sup>.

The fact that only about half of the pregnant mothers (51.8 %, n=57) had been recommended for antenatal exercises during the current pregnancy as found in the present study conducted in a leading maternal hospital in the country is a concern. Adding on to the situation, the assessment of knowledge revealed that only 27.3% (n=30) of pregnant mothers possessed a ‘Good/Excellent’ overall knowledge on antenatal exercises and the level of knowledge was not associated with having been recommended antenatal exercises. Emanating from these findings it was not surprising that only 15 (13.6%) among the study population were practicing antenatal exercises according to the recommended frequency. These findings should be used to advocate with service providers to take measures to rectify the situation. The fact that a great majority of pregnant mothers (n=93, 84.5%) had ‘somewhat favorable’ or ‘favourable’ attitudes towards antenatal exercises indicates the potential success of such an initiative should be highlighted in the advocacy efforts. Similar to the findings of the present study, a study in Nigeria, among 189 of pregnant women also found that a majority demonstrated inadequate knowledge (47.6%, n=89) but had positive attitude towards antenatal exercises<sup>9</sup>as the present study. Furthermore, a study in Bangalore to assess the effectiveness of a structured teaching programme on selected antenatal exercises found deficient knowledge and practices and favourable attitudes about antenatal exercise among antenatal women at its baseline assessment prior to the intervention. The structures teaching programme was found to be very effective in improving knowledge,

**Distribution of the study participants by the level of Knowledge as the total score regarding antenatal exercises**

Knowledge	No: (n=110)	%
Poor	80	72.7
Good	28	25.5
Excellent	2	1.8
Total	110	100

**Distribution of the study participants by the level of attitudes as the total score regarding antenatal exercises**

Attitudes	No: (n=110)	%
Unfavorable	17	15.5
Somewhat favorable	54	49
Favorable	39	35.5
Total	110	100

**Table 4: Association of socio-demographic and pregnancy related characteristics and overall knowledge regarding antenatal exercises among pregnant mothers.**

Socio-demographic and pregnancy related details	Characteristics	Overall knowledge		
		Poor No. (%)	Good/Excellent No. (%)	Significance
Parity	Primi para	28(35.0%)	13(43.3%)	$\chi^2=0.648$ , df=1 $p=0.421$
	Multi para	52(65.0%)	17(56.7%)	
Period of amenorrhoea	20- 30 weeks	19(23.8%)	7(23.3%)	$\chi^2=0.002$ , df=1 $p=0.963$
	31-40 weeks	61(76.2%)	23(76.7%)	
Age	25 years or less	28(35.0%)	6(20.0%)	$\chi^2=2.299$ , df=1 $p=0.129$
	26 years or more	52(65.0%)	24(80.0%)	
Religion	Buddhist	30(37.5%)	15(50.0%)	$\chi^2=1.410$ , df=1 $p=0.235$
	Non Buddhist	50(62.5%)	15(50.0%)	
Level of highest education	Up to grade 11 or less	5(6.2%)	0(0.0%)	$\chi^2=1.964$ , df=1 $p=0.161$
	More than grade 11	75(93.8%)	30(100.0%)	
Occupation during pregnancy	Housewife	69(86.2%)	20(66.7%)	$\chi^2=5.417$ , df=1 $p=0.020$
	Doing a job	11(13.8%)	10 (33.3%)	
Average monthly family income	25000 or less	36(45.0%)	44(55.0%)	$\chi^2=0.025$ , df=1 $p=0.876$
	More than 25000	13(43.3%)	17(56.7%)	
Number of living children	No children	29(36.2%)	13(43.3%)	$\chi^2=0.464$ , df=1 $p=0.496$
	Having children	51(63.7%)	17(56.7%)	
Living with extended family	Yes	51(63.7%)	17(56.7%)	$\chi^2=0.464$ , df=1 $p=0.496$
	No	29(36.3%)	13 (43.3%)	
District of residence	Colombo district	47(58.7%)	11(36.7%)	$\chi^2=4.269$ , df=1 $p=0.039$
	Other	33(41.3%)	19(63.3%)	
Has been recommended antenatal exercises	Yes	39(48.7%)	18(60%)	$\chi^2=1.106$ , df=1 $p=0.293$
	No	41(51.3%)	12(40%)	

Doing a job during pregnancy was significantly associated with possessing a 'Good/Excellent' level of knowledge on antenatal exercises among pregnant mothers ( $p=0.02$ ). Similarly, living in a district other than Colombo was also associated significantly with 'Good/Excellent' level of knowledge regarding antenatal exercises ( $p=0.039$ ).

attitudes and practices about antenatal exercises among antenatal women<sup>10</sup>.

Being occupied was associated with a level of 'Good/excellent' knowledge regarding antenatal exercises. The relationship of being employed and better knowledge regarding maternal and child health has been established by many researchers<sup>11,12</sup>.

The sources of information regarding antenatal exercises among approximately half of the pregnant mothers in the present study were print and visual media while lesser numbers have obtained the information from health professionals. These results are similar to the study in Nigerian pregnant mothers where the principal sources of information on physical exercise mentioned had been the television (55.3%)<sup>9</sup>.

In conclusion many pregnant women attending DMH have poor knowledge and practices regarding antenatal exercises while their attitudes were mostly favourable. Measures should be taken to improve knowledge and practices of pregnant mothers regarding antenatal exercises. The study recommends designing a culturally appropriate educational package on antenatal exercises and to assess its effectiveness in improving practice as a pilot project.

**ACKNOWLEDGEMENTS**

I wish to acknowledge the Director of the De Soyza Maternity Hospital Colombo for granting me permission to implement this research in the antenatal clinics. I also would like to convey my heart felt gratitude for the consultants for granting me permission to conduct this research in the antenatal clinics of the De Soyza Maternity Hospital Colombo. My sincere thanks go to all pregnant mothers of this study for their cooperation and willingness to take part in this study. ■

**Table 5: Relationship between socio-demographic characteristics and attitudes regarding antenatal exercises**

Socio-demographic and pregnancy related details	Characteristics Unfavourable No. (%)	Attitude score		
		Somewhat favourable/ favourable No. (%)		Significance
Parity	Primi para	9 (52.9%)	32 (34.4%)	$\chi^2=2.111$ , df=1 p=0.146
	Multi para	8 (47.1%)	61 (65.6%)	
Period of amenorrhoea	20- 30 weeks	6(35.3%)	20 (21.5%)	$\chi^2=1.514$ , df=1 p=0.219
	31-40 weeks	11(64.7%)	73 (78.5%)	
Age	25 years or less	8 (47.1%)	26 (28.0%)	$\chi^2=2.456$ , df=1 p=0.117
	26 years or more	9 (52.9%)	67 (72.0%)	
Religion Non Buddhist	Buddhist	4 (23.5%)	41 (44.1%)	$\chi^2=2.512$ , df=1 p=0.113
	Non Buddhist	13 (76.5%)	52 (55.9%)	
Level of highest education More than grade 11	Up to grade 11 or less	1 (5.9%)	4 (4.3%)	$\chi^2=0.083$ , df=1 p=0.773
	More than grade 11	16(94.1%)	89 (95.7%)	
Occupation during pregnancy Doing a job	Housewife	14(82.4%)	75(80.6%)	$\chi^2=0.027$ , df=1 p=0.869
	Doing a job	3(17.6%)	18(19.4%)	
Average monthly family income More than 25000	25000 or less	13(76.5%)	36(38.7%)	$\chi^2=8.296$ , df=1 p=0.004
	More than 25000	4(23.5%)	57(61.3%)	
Number of living children Having children	No children	9 (52.9 %)	33(35.5%)	$\chi^2=1.856$ , df=1 p=0.173
	Having children	8(47.1%)	60(64.5%)	
Living with extended family No	Yes	11(64.7%)	57(61.3%)	$\chi^2=0.071$ , df=1 p=0.790
	No	6(35.3%)	36(38.7%)	
District of residence Other	Colombo district	11(64.7%)	47(50.5%)	$\chi^2=1.158$ , df=1 p=0.282
	Other	6(35.3%)	46(49.5%)	
Has been recommended antenatal exercises No	Yes	9(52.9%)	48(51.6%)	$\chi^2=0.010$ , df=1 p=0.920
	No	8(47.1%)	45(48.4 %)	

Having an average family monthly income of Rs. 25000 or more was significantly associated with possessing 'somewhat favourable/favourable' attitudes on antenatal exercises among pregnant mothers (p=0.004).

## REFERENCES

- Kisner C, Colby L. Therapeutic exercise. 5th ed. F. A. Davis Company; 2007.
- Zavorsky GS, Longo LD. Adding strength training, exercise intensity, and caloric expenditure to exercise guidelines in pregnancy. *Obstet Gynecol.* 2011 Jun;117(6):1399-402.
- Athukorala U. Pre and post natal exercises. Ministry of Health; 2011.
- Sharma S. to assess the knowledge, attitude and practice regarding selected antenatal exercises among the pregnant women attending OPD, in a selected hospital of Bangalore. 2007;
- Artal R, O'Toole M. Guidelines of the American College of Obstetricians and Gynecologists for exercise during pregnancy and the postpartum period. *Br J Sports Med.* 2003 Feb 1;37(1):6-12.
- Ribeiro CP, Milanez H. Knowledge, attitude and practice of women in Campinas, São Paulo, Brazil with respect to physical exercise in pregnancy: a descriptive study. *Reprod Health.* 2011;8(1):31.
- Abedzadeh M, Taebi M, Sadat Z, Saberi F. Knowledge and performance of pregnant women referring to Shabihkhani hospital on exercises during pregnancy and postpartum periods. *J Jahrom Univ.* 2011;8(1).
- Jones J, Housman J, McAleese W. Exercise, nutrition, and weight management during pregnancy. *Am J Heal Stud.* 2010;120-8.
- Mbada C, Adebayo O. Knowledge and Attitude of Nigerian Pregnant Women

**Table 6: Relationship between socio-demographic characteristics and practices regarding antenatal exercises**

Socio-demographic and pregnancy related details	Characteristics	Practice score		
		Inadequate No. (%)	Good No. (%)	Significance
Parity	Primi para	35(35.7%)	6(50.0%)	$\chi^2=0.933$ , df=1 p=0.334
	Multi para	63(64.3%)	6(50.0%)	
Period of amenorrhoea	20- 30 weeks	23(23.5%)	3(25.0%)	$\chi^2=0.014$ , df=1 P=0.906
	31-40 weeks	75(76.5%)	9(75.0%)	
Age	25 years or less	30(30.6%)	4(33.3%)	$\chi^2=0.037$ , df=1 p=0.847
	26 years or more	68(69.4%)	8(66.7%)	
Religion	Buddhist	38(38.8%)	7(58.3%)	$\chi^2=1.692$ , df=1 p=0.193
	Non Buddhist	60(61.2%)	5(41.7%)	
Level of highest education	Up to grade 11 or less	5(5.1%)	0(0.0%)	$\chi^2=0.641$ , df=1 p=0.423
	More than grade 11	93(94.9%)	12(100.0%)	
Occupation during pregnancy	Housewife	76(80.6%)	10(83.3%)	$\chi^2=0.051$ , df=1 p=0.821
	Doing a job	19(19.4%)	2(16.7%)	
Average monthly family income	25000 or less	42(42.9%)	7(58.3%)	$\chi^2=1.037$ , df=1 p=0.309
	More than 25000	56(57.1%)	5(41.7%)	
Number of living children	No children	36(36.7%)	6(50.0%)	$\chi^2=0.797$ , df=1 p=0.372
	Having children	62(63.3%)	6(50.0%)	
Living with extended family	Yes	60(61.2%)	8(66.7%)	$\chi^2=0.134$ , df=1 p=0.714
	No	38(38.8%)	4(33.3%)	
District of residence	Colombo district	55(56.1%)	3(25%)	$\chi^2=4.154$ , df=1 p=0.042
	Other	43(43.9%)	9(75%)	
Has been recommended antenatal exercises	Yes	49(50%)	8(66.7%)	$\chi^2=1.189$ , df=1 p=0.275
	No	49(50%)	4(33.3%)	

Living in a district other than Colombo was also associated significantly with a 'Good' level of practices regarding antenatal exercises (p=0.042).

- towards Antenatal Exercise: A Cross-Sectional Survey. ISRN Obstet Gynecol. 2014;
- Joseph B. A study to assess the effectiveness of a structured teaching program on selected antenatal exercises in terms of knowledge, attitude and practice of antenatal women. 2005;
  - Rautava P, Sillanpää M. The Finnish Family Competence Study: knowledge of childbirth of nulliparous women seen at maternity health care clinics. J Epidemiol Community Health. 1989;43(3):253-60.
  - Mahmoud M, Nasr A, Gasmelseed D, Abdalehafiz M, Elsheikh M, Adam I. Knowledge and attitude toward HIV voluntary counseling and testing services among pregnant women attending an antenatal clinic in Sudan. J Med Virol. 2007;79(5):469-73.