

Factors associated with compliance to a course of physical exercises for a selected group of primigravida mothers in Sri Lanka

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Abstract

Introduction: The aim of this study was to assess factors associated with compliance to a course of exercises administered for a selected group of primigravida mothers in second trimester.

Methods: This was a descriptive cross sectional and qualitative study performed at a Medical Officer of Health area in Kegalle district. Study population was a group of postnatal mothers who had taken part in the course of exercises from second trimester, for a period of 16 weeks. Sample size was 138 postnatal mothers. Study instruments were a self-administered questionnaire to obtain baseline data, psychological state and compliance to exercises, a diary and an interviewer administered questionnaire for views of husband and household members.

Results: There were statistically significant associations between maternal age being less than or equal to 30 years and increase regularity of exercises ($p < 0.05$), levels of education of husbands and the exercise regularity of pregnant mothers ($p < 0.05$) and absence of physical symptoms and increase participation in regular exercises ($p < 0.05$). There was no statistically significant association ($p > 0.05$) between psychological distress status at six weeks postpartum and exercise regularity. There was a statistically significant association ($p < 0.05$) between regularity of exercise and reduced presentation of depression at six weeks postpartum. Lethargy (41%), tiredness (20%), lack of time (16%), lack of privacy (13%) and absence of husband (11%) were reasons for not carrying out exercises regularly. Encouragement and motivation by family members (38%), husband (33%) and Public Health Midwife (27%) and feeling of good health after doing exercises (20%) were the main factors which helped a mother to carry out exercise regularly.

Conclusions: Younger age, absence of physical symptoms and absence of depressive symptoms is significantly associated with regularity of exercises as opposed to irregularity

Key words: antenatal, compliance, exercises, physical, psychological

INTRODUCTION

Pregnancy is a time of intense physical change and it is associated with a great deal of emotional upheaval in many women. Although motherhood is often a positive and fulfilling experience, for some women it is associated with suffering, ill-health and even death. The safe-motherhood

initiative launched in 1987 emphasizes all women to receive not only curative, but preventive measures as well, as they need to be safe and healthy throughout pregnancy and childbirth.

Different countries use different techniques to manage a pain free pregnancy and delivery which includes exercises during pregnancy such as Yoga, breathing exercises, meditation, Lamaze technique, Bradley method, Reiki, Pilates etc. In Sri Lanka, antenatal exercises are offered to pregnant women at some government and private sector hospitals and organizations. Some government hospitals and many field antenatal clinics educate women on the importance of physical exercises during pregnancy.

But, a relevant question is whether the pregnant females would be willing to comply with a course of exercises. Even if they initially complied to exercise, whether they will continue it up to delivery of the baby is doubtful.

Though scarce, some researchers have looked at this question. A USA study revealed that those who have exercised prior to pregnancy continued to do so with a lesser average intensity¹. Other correlates of physical activity in pregnancy from research were higher level of education, higher level of income, white women, non-smokers and those who consume high proteins^{1,2}. An exploratory analysis of exercise adherence patterns with sedentary pregnant women revealed that women who demonstrated high adherence at the beginning tended to remain that way and vice versa³.

Therefore, this study was conducted to determine the extent of compliance to a course of antenatal exercises and to assess the factors associated with compliance of pregnant females.

METHODS

A descriptive cross sectional study with qualitative components was carried out at the Medical Officer of Health (MOH) area, Galigamuwa in Kegalle district. In an earlier component of this study, an intervention study was conducted to implement a course of antenatal exercises for primigravid mothers from their second trimester (illustration 1). The study population was all the mothers in the intervention arm, exercised for at least 16 weeks. These 138 mothers were recruited at six weeks after delivery.

Data collection was carried out using a self-administered questionnaire to obtain baseline data and compliance to exercises, General Health Questionnaire (GHQ) 30 to assess psychological distress, Edinburgh Postpartum Depression Scale (EPDS)

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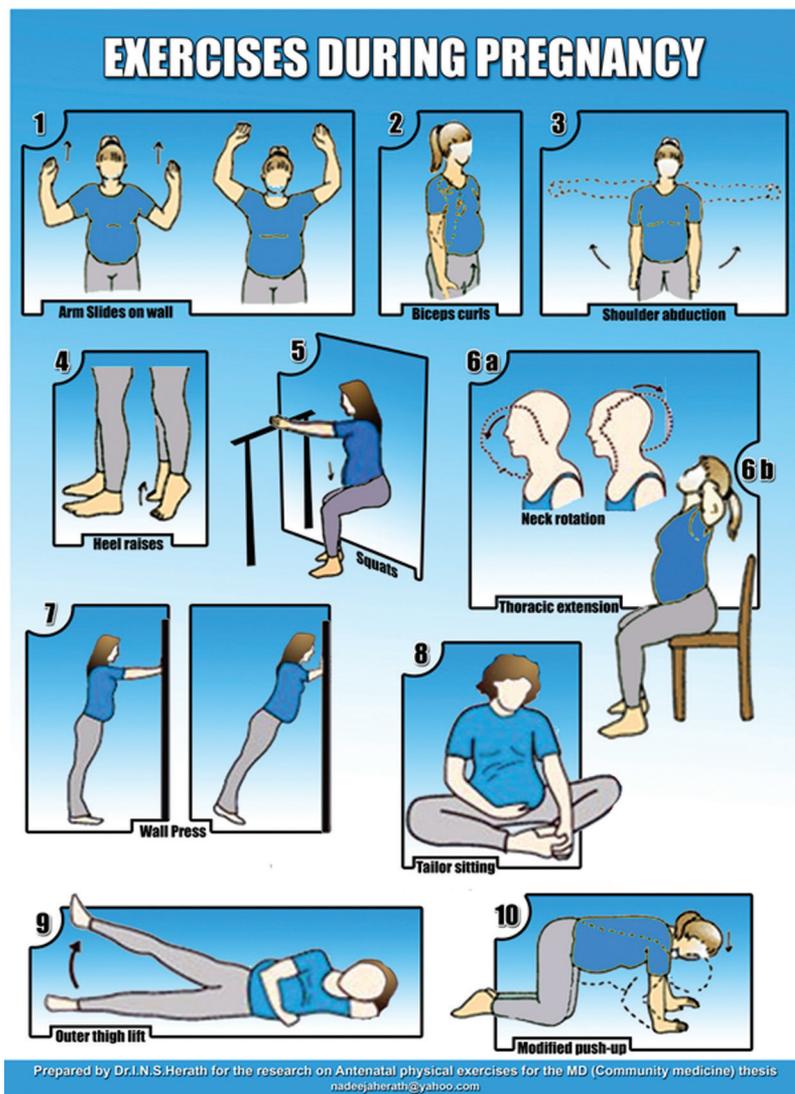
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Illustration 1

Exercise guideline for antenatal mothers (which was to be carried out for 16 weeks from second trimester)



to assess level of depression, an interview guide for views of husbands and other household members (selected randomly) and the diary which was used to record exercise dates and times during pregnancy was scrutinized. Measures like observing the skillfulness of carrying out exercises and asking the mothers to demonstrate an exercise step to see if they had genuinely adhered to exercise schedule regularly had been carried out during the earlier component of the study to assess the accuracy of the entries in the diary.

Ethical clearance was obtained from the Faculty of Medical Sciences, University of Sri Jayawardenapura and administrative clearance was

obtained from the Regional Director of Health Services in Kegalle District. Validity of the questionnaires were ensured by assessing the face validity, content validity and consensual validity by a multi-disciplinary panel of experts in the fields of Community Medicine, Obstetrics and language.

Confidentiality of study participants were maintained at all levels and mothers with EPDS scores more than 9 were informed to MOH and also referred to the Psychiatry clinic at the local hospital.

RESULTS

Moderate exercise for 30 minutes or more per day on three or more days of the week was considered as regular

exercises for a pregnant woman. Of the 138 mothers, 71 (51.4%) had participated in exercises regularly.

Socio-demographic factors were cross tabulated with regularity of exercises in table 1. Regularity of exercises was associated with younger age 30 years and below ($\chi^2=10.1$, $p < .05$) and with ethnicity other than Sinhala ($\chi^2=0.36$, $p > .05$). In table 2, regularity of exercises showed a significant association with the educational level of the husband ($\chi^2=8.98$) and there was an increasing regularity of exercises with decreasing age of the husband though not significant ($\chi^2=3.88$, $d.f.=2$, $p > .05$).

There was no statistically significant difference ($p > 0.05$) with living arrangement of the couple and the exercise regularity in this study (table 3).

Nearly 60% among mothers who had no physical problems had participated in regular exercises whereas it was only about 39% among those mothers with physical problems. There was a statistically significant association ($p < 0.05$) between the absence of physical problems and increased participation in exercises regularly (table 4).

Among those mothers who were not psychologically distressed (GHQ-30 score ≤ 5), more than half had participated in regular exercises (table 5). There was only about 25% mothers among the psychologically distressed (GHQ-30 score > 5) who participated in regular exercises. However, there was no statistically significant association ($p > 0.05$) between psychological distress status at six weeks postpartum and exercise regularity. Similarly, among mothers who were not depressed (EPDS score ≤ 9), more than half had participated in regular exercises. Less than 10% had participated in regular exercises among mothers who were depressed (EPDS score > 9). This association of no depression and increased regularity of exercise among six weeks postpartum mothers was statistically significant ($p < 0.05$).

There were other factors associated with compliance to physical exercises. Lethargic feeling (41%) was the main

Table 1. Regularity of exercises in the antenatal mother by selected socio demographic factors

Socio demographic factors of antenatal mother	Exercises		Significance
	Regular (N=71) n (%)	Irregular (N=67) n (%)	
Age group (in years)			
Up to 30	67 (57.8)	49 (42.2)	* $\chi^2=10.1$
>30	4 (18.2)	18 (81.8)	df=1 $p<0.05$
Level of education			
Up to grade 10	7 (53.8)	6 (46.2)	$\chi^2=0.03$
Grade 11 & above/ others	64 (51.2)	61(48.8)	df=1 $p>0.05$
Occupation			
Employed	14 (48.3)	15 (51.7)	$\chi^2=0.15$
Housewives	57 (52.3)	52 (47.7)	df=1 $p>0.05$
Ethnicity			
Sinhala	65 (50.4)	64 (49.6)	* $\chi^2=0.36$
Tamil & Muslim	6 (66.7)	3 (33.3)	df=1 $p>0.05$

*Yates continuity correction done

reason given for not carrying out exercises regularly by the mothers in this group. This was followed by tiredness (20%) and lack of time (16%). These were all intrapersonal factors. The main interpersonal factors were lack of privacy at home (13%) and absence of husband (11%). Beliefs have also contributed to compliance in this study, which is depicted by 1.4% not exercising on full moon days (table 6).

The main factors which helped a mother to carry out exercise regularly (table 7) were encouragement and motivation by family members (38%) and the husband (33%). The encouragement and motivation by Public Health Midwife (PHM) accounted for about 27%. These were all interpersonal factors whereas the main intrapersonal factor was feeling of good health after doing exercises (20%).

The main method which was used by antenatal mothers to cope with difficulties encountered while carrying out exercises (table 8) was to have a flexible time for exercises (20%).

The majority of the mothers (70%) have not encountered any problems while doing exercises (table 9). The major problem mothers felt while exercising was uncomfortable feeling (14%) followed by non-specific pains (10%).

Perceived benefits of doing regular exercises were enquired. About 34% of the mothers have "felt good" after doing regular exercises whereas about 23% were able to keep up good health (table 10). Another 20% have felt that it would improve mental health and/or maintain the body figure after pregnancy.

When enquired about methods that can be used to improve this exercise course (as perceived by antenatal mothers), about 28% of mothers felt that myths in society with regard to pregnancy and exercises should be eliminated. 15% felt that the message of exercises need to be spread among the peer groups and a similar percentage felt that it is necessary to educate and spread the message to other mothers (table 11).

The factors that would increase the participation of more mothers in this type of exercise programmes, according to antenatal mothers, were also elicited (table 12). Many mothers (38%) interviewed felt that increasing the knowledge and attitude of mothers with regard to maternal exercises would increase participation of more mothers in this type of exercise programme. This was followed by education about benefits of exercises (33.3%) and increasing positive beliefs towards exercises (23.2%). About 2% of the mothers were of the view that mothers who exercise and do not exercise should exchange knowledge/ views.

Interview of selected number of husbands (N=45) and household members (N=20), who volunteered to participate in the discussion, was also carried out. About 38% of husbands feel that their wives tend to complain less when they were engaged in exercises. Some (33.3%) husbands feel that wives become more active while some (22.2%) feel that wives become more cheerful after exercises. However, about 7% of the husbands say that their wives sometimes complain of aches and pains after exercises. Majority (67%) of husbands feel that the given exercises course as a whole was not difficult. Whereas 60% feel that it can be carried out by pregnant mothers very easily. Also, 13% husbands feel that exercises should be made compulsory.

Enquiry from other household members with regard to the behavior of pregnant mothers when engaging in exercises revealed that, antenatal mothers engaged in household work more after exercises (50%). Of them, 40% said the mothers seemed to be happier and 35% said they complained

less or not complained of aches and pains at all. Furthermore, majority (70%) of the household members feel that exercises should be introduced to all mothers. They are also of the view that exercises are not difficult (60%).

DISCUSSION

The participants in this study were postnatal mothers who had delivered their first baby and had taken part in an exercise programme for sixteen weeks during the antenatal period, commencing in their second trimester of pregnancy. Of the 138 females who completed the prescribed period of exercises, 51.4% had done it regularly. This is satisfactory in comparison to an estimate of 42% exercising during pregnancy⁴. Socio-demographic data of mothers were obtained in addition to finding out about the feasibility of carrying out an exercise course from the mother. Also, assistance from husband and other family members were assessed.

The diary method used to record exercises was a common method which was used for exercises worldwide⁵ to recall the exercise dates. The success of this method depends on how well it was introduced to the study participants and the frequency of reinforcements.

In this study, regular exercisers were younger and their husbands also were younger (latter was not significant). In contrast, a study analyzing the Danish National Birth cohort and found an increased likelihood of exercise engagement of mothers who were above 25 years of age. However, it had considered all parity levels and therefore it may be due to the fact that those mothers were experienced, and, when mothers were aware of benefits of exercises they tend to continue it⁶.

When regularity of exercises were considered, there was an increased proportion of mothers with physical problems who had not participated in regular exercises (62%) which was statistically significant. This was confirmed in a study which found that main perceived barrier for physical activity during pregnancy was intrapersonal health related causes (52.1%)⁷.

Table 2. Regularity of exercises by selected socio demographic factors of husband

Socio demographic factors of husband	Exercises		Significance
	Regular (N=71) n (%)	Irregular (N=67) n (%)	
Age of husband (in years)			
Up to 25	14 (66.7)	7 (33.3)	$\chi^2=3.88$ df=2 p>0.05
26 to 30	35 (53.8)	30 (46.2)	
≥31	22 (42.3)	30 (57.7)	
Education			
Up to grade 10	16 (80.0)	4 (20.0)	$\chi^2=8.98$ df=3 p<0.05
Grades 11 - 12	25 (43.1)	33 (56.9)	
Higher Education	12 (54.5)	10 (45.5)	
Vocational training	18 (47.4)	20 (52.6)	
Occupation			
Professional	7 (53.8)	6 (46.2)	$\chi^2= 2.9$ df=3 p>0.05
Manager, technician, clerical, service/sales	18 (62.1)	11 (37.9)	
Agriculture/ fisheries, crafts/ related trade, plant/ machine operator, elementary occupation	34 (51.5)	32 (48.5)	
Armed forces	12 (40.0)	18 (60.0)	

Table 3. Regularity of exercises by the living arrangement of the couple

Living arrangement	Exercises		Significance
	Regular (N=71) n (%)	Irregular(N=67) n (%)	
Other occupants living in the house			
Wife's parents	18 (40.0)	27 (60.0)	$\chi^2=3.53$ df=2 p>0.05
Husband's parents	38 (56.7)	29 (43.3)	
Other	15 (57.9)	11(42.1)	
Relatives/ non relatives other than parents of either party living with couple			
Yes	11 (40.7)	16 (59.3)	$\chi^2=1.05$ df=1 p>0.05
No	60 (54.1)	51 (45.9)	

It was found in our study that depression was significantly associated with regularity of exercises. Nearly 92% of mothers who had a high EPDS score had not participated in exercises regularly in our study. Another study disclosed that one of

the reasons for decline of maternal exercises was psychological factors⁸. There was no statistically significant association between presence of psychological distress and regularity of exercises in our study.

Table 4. Regularity of exercises by physical problems at six weeks postpartum

Physical problems	Exercises		Significance
	Regular (N=71) n (%)	Irregular (N=67) n (%)	
Present	20 (38.5)	32 (61.5)	$\chi^2= 4.83$, df=1 p<0.05
Absent	51 (59.3)	35 (40.7)	

Table 5. Regularity of exercises by psychological problems at six weeks postpartum

psychological problem	Exercises		Significance
	Regular (N=71) n (%)	Irregular (N=67) n (%)	
Psychological distress			$* \chi^2= 2.61$ df=1 p>0.05
Present (>5)	3 (25.0)	9 (75.0)	
Absent (≤ 5)	68 (54.0)	58 (46.0)	
Depression			$* \chi^2=7.98$ df=1 p<0.05
Present (>9)	1(8.3)	11(91.7)	
Absent (≤ 9)	70 (55.6)	56 (44.4)	

*Yates continuity correction applied

Table 6. The reasons provided by mothers for not carrying out exercises regularly were given as follows

The reasons provided for not carrying out exercises regularly	Number (N=138)	Percent (%)
Felt lethargic sometimes	57	41.3
Felt tired after coming home from work sometimes	28	20.3
Lack of time sometimes	22	15.9
There were visitors at home/ no privacy	18	13.0
Husband was not at home	15	10.9
Came home late	05	3.6
Lack of room in the house for exercises sometimes	03	2.2
Forbidden to exercise on some days (full moon days)	02	1.4
Exercise uncomfortable in latter part of pregnancy	02	1.4
Had to go visiting sometimes	01	0.7

Main reasons for not carrying out exercises regularly were intrapersonal and the main factors which helped a mother to carry out exercise regularly were mainly interpersonal. This highlights the importance of getting the husband and other family members involved in the activity from the planning stage in early pregnancy. A Canadian study also found that family support was very much more important when an individual was exercising according to guidelines set out by a health professional⁹. Participants in our study valued the encouragement and motivation given by the area Public Health Midwife. This can be promoted by the hospital based health professionals through the strategy of reorienting health services in the concept of health promotion.

When compliance to exercises was enquired from the mothers in our study, we found that lethargy (41%), maternal tiredness (20%), being too busy (15.9%), exercise being uncomfortable during the latter part of pregnancy and safety concerns (1.4%) and many other factors played an important role for not carrying out exercises regularly. These were similar to the findings of Duncombe and others in which they described the factors which reduced the amount and intensity of exercises over the course of pregnancy¹⁰. Similar findings of health and non-health related factors were obtained by others studying barriers to physical activity among pregnant women^{7,11}.

More than two-third of the mothers did not encounter any problems while exercising and there were many benefits of exercising as felt by the women. These can be further studied as to their scientific basis and used in motivating pregnant females for exercising during pregnancy. In addition, their suggestions in tables 11 and 12 can be incorporated in popularizing the culture of antenatal exercises among pregnant females

Table 7. The factors which helped the antenatal mothers carry out exercises regularly were given as follows

The factors which helped the antenatal mothers carry out exercises regularly	Number (N=138)	Percent (%)
Encouragement and motivation by family members – mother/father/in-laws/sister etc.	53	38.4
Encouragement and motivation by husband	45	32.6
Encouragement and motivation by PHM	37	26.8
Feeling of good health after doing exercises	28	20.3
Praise of others	19	13.8
Keen interest for exercises	12	8.7
A relaxed mind set	03	2.2
Less work as mother/ mother in law did most of the work at home	02	1.4

Table 8. The methods used by antenatal mother to cope with difficulties encountered while carrying out exercises were as follows

The methods used by antenatal mother to cope with difficulties encountered while carrying out exercises	Number (N=138)	Percent (%)
Have a flexible time for exercises – did not have a fixed time	27	19.6
Weekly pre schedule a time period for the exercises	24	17.4
Take breaks in between exercises without doing daily	23	16.7
After coming from work rest for a while before engaging in exercises	20	14.5
Ask husband to remind about exercises	18	13.0
Reduce speed of exercises	13	9.4
Carry out exercises during holidays	11	8.0
Stop difficult exercises & carry out only easy exercises	09	6.5
Ask husband to join in the exercises	08	5.8
Arranged a separate area in the house for exercises	07	5.1
Engaged in exercises when visitors/ house members were not around; so did not felt ashamed	06	4.3
Do the exercises early in the morning	04	2.9

Table 9. The problems faced by antenatal mother while doing exercises were given as follows

The problems faced by antenatal mother while doing exercises	Number (N=138)	Percent (%)
No problems	96	69.6
Uncomfortable feeling	19	13.8
Non-specific pain	14	10.1
Lower back ache	05	3.6
Lower abdominal pain	03	2.2
Pain in the legs	02	1.4
Tiredness	02	1.4
Pain in the wrists	01	0.7

Table 10 The benefits perceived by mothers by engaging in regular exercises

The benefits perceived by mothers by engaging in regular exercises	Number (N=138)	Percent (%)
Feel good	47	34.1
Keep up good physical health	32	23.2
Improve mental health of the mother	28	20.3
Maintain the body figure after pregnancy	27	19.6
Gain self confidence	22	15.9
Feel less fatigued	21	15.2
Reduce body aches and pains	16	11.6
Made mother and baby healthy	12	8.7
Improve wound healing	09	6.5
Delivery of baby was easy	06	4.3
Does not become obese	05	3.6
Can engage in all household work as usual	03	2.2
Burn out excess fat	02	1.4
Breathing becomes easy	01	0.7

Table 11. Methods that can be used to improve this exercise course as perceived by antenatal mothers were given as follows

Methods that can be used to improve this exercise course as perceived by antenatal mothers	Number (N=138)	Percent (%)
Myths in society with regard to pregnancy & exercises should be eliminated	38	27.5
Spread the message of exercises among peer groups	21	15.2
Educate and spread the news of exercises to other mothers as much as possible	20	14.5
Show lively colourful pictures to demonstrate exercises	18	13.0
Should educate all family members with regard to exercises	18	13.0
Make husband participate in exercise training compulsory	17	12.3
Demonstrate how to carry out these exercises using a pregnant mother	08	5.8
Teach the exercises step by step	02	1.4
Introduce less difficult exercises	01	0.7

in all strata of the society by creating supportive environment under the concept of health promotion.

With regard to the limitations of the study, exercises carried out by the participants were recorded in a diary provided to them in the intervention study. There may have been issues on the authenticity of the entries. Also, this study was based on the 138 females who completed the prescribed course of exercises. If the females in the control arm of the intervention study and those who did not complete the course of exercises in the intervention arm were studied, that could have been more informative.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that younger age, absence of physical symptoms and absence of depressive symptoms is significantly associated with regularity of exercises as opposed to irregularity. It is important to get the husband and other family members and also the area Public Health Midwife involved from the planning stage in prescribing antenatal exercises by the health professional to overcome the barriers which were mainly intrapersonal. The experience and opinion of the study participants can be used in motivating pregnant females for exercising during pregnancy.

Further research is recommended among non-compliant females of antenatal exercises to verify the findings of this study.

Introduction of an intervention or a national programme like this set of exercises during pregnancy should be accompanied by strategies to increase compliance. ■

Table 12. Factors that would increase the participation of more mothers in this type of exercise programmes, as perceived by antenatal mothers were given as follows

Factors that would increase the participation of more mothers in this type of exercise programmes, as perceived by antenatal mothers	Number (N=138)	Percent (%)
Increase knowledge and attitude of mothers with regard to maternal exercises	52	37.7
Educate mothers about the benefits of exercises	46	33.3
Increase positive beliefs towards exercises	32	23.2
Educate the elders who are living with the mothers	19	13.8
Should introduce this to all mothers alike to improve participation	12	8.7
Educate mothers on clinic days	06	4.3
Exchange knowledge among mothers who exercise & do not exercise	03	2.2
Inform the VOOG in the area and get their support as well	01	0.7

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