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Effect of Socio-Demographic and Clinical Characteristics on Physical Activity of Pregnant Women at Referral Hospital in Riyadh, KSA

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ABSTRACT

Objective: *The objective of this study was to investigate the effects of socio demographic and clinical characteristics of pregnant women on their physical activity. Methods: An observational quantitative cross sectional design was carried out in the delivery ward and paediatrics clinic of king Khalid University Hospital, Riyadh, Saudi Arabia. The study subjects included all women who had delivered in the last three months, during the study period between 2013-2014. The sample size was 336. Data collection included socio-demographic variables, pregnancy related variables and the physical activity by using validated pregnancy physical activity questionnaire.*

Results: *The mean (standard deviation) total physical activity score of all the study subjects was 197.39(72.1). The physical activity scores are statistically significantly higher in younger women, graduation education level, and among those who were employed. The physical activity scores were statistically significantly higher in women who had normal delivery, did not have any illness and those who had followed the advice to perform physical activity.*

Conclusion: *The levels of physical activity along with their socio demographic and clinical characteristic were assessed among the pregnant women. The study found low pursuance of physical activity during pregnancy. Any kind of illness suffered during pregnancy further reduced the physical activity levels. It was only the young and educated pregnant women who held onto regular physical activity as advised during their pregnancy.*

Keywords: Socio-demographic, physical activity, pregnancy

INTRODUCTION

Physical activity is a major component of wellness programs of children, men and women alike. Physical activity promotes healthy living and prevents development of many non-communicable diseases like cardiovascular ailments, diabetes, obesity, and other musculo-skeletal disorders [1]. Pregnant women are no exception to this saying. Physical activity promotes wellbeing of both mother and foetus, aids in normal growth and favours normal delivery [2]. Abdominal pelvic exercises and lower limb exercises are recommended by the gynaecologists during pregnancy which has lasting beneficial effects throughout the life of the mother and child. Many epidemiological studies have determined the positive outcomes of exercise during pregnancy like improved muscular tone, reduced pre-eclampsia and urinary incontinence, decreased risk of gestational diabetes and hypertensive disorders and positive effect even on pregnancy and post-partum related mood-psychological disorders [3-5]. However, there are reports which have also published the adverse effects of increased activity on pregnancy [6]. Hence the American College of Obstetricians and Gynaecologists (ACOG) brought out guidelines on recommended levels of physical activity for pregnant women based on the required intensity and duration [7]. The guidelines also suggested physical activity for women with obstetric complications, sedentary women and clearly stated the conditions where the physical activity featured

absolute contraindications. Hence by all probability physical activity during pregnancy produces a more beneficial outcome than the yesteryear myths which forced pregnant women to become sedentary.

The data on levels of physical activity among pregnant women in Saudi Arabia is scarce. Hence this study was performed with the objective of determining the effects of socio-demographic variables on the pattern of physical activity among women between the age of 20 and 40 during their last pregnancy, at King Khalid University Hospital from February 2014 to April 2014 and to assess the its effect on their pregnancy outcomes.

METHODOLOGY

An observational quantitative cross sectional study was conducted in the time between 2013-2014. The study contained 325 subjects who were either admitted to the delivery ward or were visitors at paediatric clinic with a postpartum range of up to 3 months at the king Khalid University Hospital, Riyadh, Saudi Arabia. Assuming the standard deviation of physical activity score of 4.1, with 95% confidence level and for a precision of 0.5 (d) the required sample size was 260 and considering 25% non-response, the sample size was further increased by 65 subjects. An informed consent was obtained from each patient.

The technique used in collecting the data was random selection of days. The data was collected by interviewing the participants, following a specific questionnaire. The study variables are socio-demographic characteristics such as age, nationality, residency, educational level, occupation, and general health. And the outcome variables are maternal outcome (gestational diabetes, preeclampsia, gestational weight gain, and mode of delivery), and physical activity level. A validated questionnaire- Pregnancy Physical Activity was used. The questionnaire assess the different components (household/caregiving, occupational, sports/exercise) of physical activities of a pregnant women. The level of physical activity was estimated by calculating the score using a formula provided with the questionnaire [8]. The different components of physical activity was calculated as Total activity=sum of (duration*intensity) for questions #4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36. Sedentary activity=sum of (duration*intensity) for questions #11, 12, 13, 22, 32. Light-intensity activity=sum of (duration*intensity) for questions #4, 5, 7, 15, 16, 17, 18, 20, 34, and question #30 and #31 if open-ended activities are <2.9 METs. Moderate-intensity activity=sum of (duration * intensity) for questions #6, 8, 9, 10, 14, 19,21, 23, 24, 27, 28, 29, 33, 35, 36, and question #30 and #31 if open-ended activities are >3.0 and <6.0 METs. Vigorous-intensity activity=sum of (duration*intensity) for questions #25, 26, and question #30 and #31 if open-ended activities are >6.0 METs.

STATISTICAL ANALYSIS

Descriptive statistics (frequencies, percentages, mean, standard deviation, median and inter quartile range) were used to describe the categorical and quantitative variables. Non-parametric tests Mann-Whitney U-test and Kruskal Wallis test were used to compare the mean rank values of physical activity scores in relation to the categorical study variables which have two and more than two categories. A p-value of <0.05 was used to report the statistical significance of the results.

RESULTS

Out of the total study population of 336 subjects, 97% were in the age group of 20 to 29 and >30 years, 51% were with graduation level of education, and 53% were housewives. About 115 (34.2%) were having 3 children and 31 (9.2%) were with more than 6 children. Unemployment during pregnancy was stated by 189(56.3%) study subjects and 118 (35.1%) were with monthly income of 10000 SR/- to -15000 SR/-. The self-reported general health condition was excellent in 235 (69.9%) women. About 202 (60.1%) of women were not advised to perform physical activity by their physicians (Table 1).

The mean, standard deviation, median and inter quartile range of outcome variable "physical activity" scores and its different sub scales among the pregnant women is given in Table 2.

The comparison of mean rank values physical activity scores in relation to the socio-demographic variables of women shows, highly statistical significant difference in the mean values across the categories of age, educational status, occupation, number of children in family, employment status during pregnancy and monthly income. The mean rank of physical activity score is statistically significantly higher in women of age 20 to 29 when compared with other age groups ($p=0.021$), among women with graduation level compared to women of other level of education ($p<0.0001$), among the teaching profession ($p<0.0001$) and among those who were employed when compared to the unemployed

Table 1 Distribution of Socio-demographic characteristics of study subjects

Parameters	Characteristics	No. (%)
Age (In years)	Less than 20	10 (3.0%)
	20-29	142 (42.3%)
	>=30	184 (54.7%)
Education Level	Elementary & Intermediate school	61 (19.6%)
	High school	96 (28.6%)
	Graduate	174 (51.8%)
Occupation	Housewife	178 (53.0%)
	Secretary	55 (16.4%)
	Teacher	43 (12.8%)
	Professional	54 (16.1%)
Number of Family Members (Including the Newborn)	3	115 (34.2%)
	4	82 (24.4%)
	5	77 (22.9%)
	6	29 (8.6%)
	More than 6	31 (9.2%)
Status During Pregnancy	Employed	129 (38.4%)
	Unemployed	189 (56.3%)
Family Income	Less than 5000	27 (8.0%)
	5000 - 10000	93 (27.7%)
	10000 - 15000	118 (35.1%)
	15000 - 20000	75 (22.3%)
	More than 20000	21 (6.3%)
General Health	Excellent	235 (69.9%)
	Very good	70 (20.8%)
	Good	19 (5.7%)
	Fair	2 (0.6%)

Table 2 Descriptive statistics (Mean, standard deviation, Median & Inter quartile range) of different physical activity scores of pregnant women

Variable	Mean (Standard Deviation)	Median (IQR)
Total physical activity	197.39 (72.15)	189.77 (108.24)
Sedentary activity (SA)	78.04 (36.70)	77.0 (52.50)
Light-intensity activity (LIA)	84.13 (43.80)	80.4 (67.73)
Moderate intensity activity (MIA)	34.67 (31.15)	26.71 (34.01)
Vigorous intensity activity (VIA)	0.54 (1.63)	0.0 (0.0)

women ($p<0.0001$). The women who were having 1 and 2 children were more active, as their mean rank of physical activity scores are statistically significantly higher when compared with women having 3, 4, and more than 4 children ($p<0.0001$). And the mean rank values of physical activity scores are significantly higher in women whose monthly income was between 10000 Saudi Riyals, when compared to women with other levels of monthly income ($p<0.0001$). The mean physical activity scores across the 4 categories of self-reported health condition of women is not statistically significantly different ($p=0.655$) (Table 3).

The comparison of mean rank values of physical activity score in relation to maternal and neonatal variables of women shows, statistical difference in the mean values across the categories of the mode of delivery, week of delivery, and whether they have been advised by the physician to perform physical activity. The mean rank value of physical activity score is significantly higher in women who were advised to perform physical activity by their physicians ($p=0.001$). Also, the women who were suffering with gestational diabetes and gestational weight gain were not physical active when compared with women without any illness ($p<0.0001$). The mean rank value of physical activity score is statistically significantly higher in women who had normal delivery mode compared to C-section ($p=0.009$). The women who delivered before week 37 were more active, as their mean physical activity score is higher when compared with women who delivered after week 37, but not statistically significant ($p=0.781$) (Table 4).

Table 3 Comparison of mean rank values of total physical activity score in relation to socio-demographic characteristics of study subjects

Parameters	Variables	Mean Ranks	p-value
Age	Less than 20	141.15	0.021*
	20-29	185.44	
	>=30	156.92	
Education Level	Elementary & Intermediate school	141.93	<0.0001*
	High school	130.69	
	Graduate	193.92	
Occupation	Housewife	126.6	<0.0001*
	Secretary	204.16	
	Teacher	223.84	
	Professional	207.9	
Status During Pregnancy	Employed	211.17	<0.0001*
	Unemployed	124.24	
Number of family members (including the newborn)	3	191.71	<0.0001*
	4	212.52	
	5	157.77	
	6	156.16	
	More than 6	141.76	
Family Income	Less than 5000	112.78	<0.0001*
	5000 - 10000	143.81	
	10000 - 15000	184.25	
	15000 - 20000	187.83	
	More than 20000	176.05	
General Health	Excellent	166.02	0.655
	Very good	160.81	
	Good	149.08	
	Fair	98.5	

*Statistically significant

Table 4 Comparison of mean rank values of total physical activity score in relation to maternal variables of study subjects

Parameters	Variables	Mean ranks	p-value
The physician advised the pregnant lady to perform physical activity	Yes	181.85	0.001*
	No	146.96	
Pregnancy complications	Gestational diabetes	140.26	<0.0001
	Gestational weight gain	141.77	
	None	189.19	
Mode of delivery	Normal and instrumental	171.65	0.009*
	C-section	140.75	
Week of delivery	Before week 37	170.76	0.781
	After week 37	166	

*Statistically significant

DISCUSSION

Mild to moderate physical activity in the form of walking, gentle abdominal and pelvic exercises are being highly recommended to normal pregnant women, since research has suggested numerous benefits during this physiological period of gestation of women [9]. This study has assessed the levels of physical activity among women during their gestational term.

One such study which utilized the same PPAQ done in France, obtained similar results in the mean values of total physical activity scores. The mean physical activity score obtained in our study compared to the French study was 197.39 and 202 and the mean sedentary activity was 78.04 and 64 respectively [10]. The mean of light physical activity was 84.13 in our study compared to (81) in the other study. The mean of moderate physical activity was similar in both the studies (35), while mean of vigorous physical activity obtained was largely different with 0.54 in the current study and 4 in the French study.

Many research studies have examined the relationship between maternal age and physical activity levels during pregnancy. Some of them have demonstrated that women under the age 24 years were more physically active as had been associated with higher levels of physical activity [11-13]. The current study obtained similar results of increased activity levels among younger age group between 25-29 years. However, some studies did find no association between maternal age and physical activity levels which suggest an erratic pattern of activity among the gestational women [14,15].

Education levels usually have profound effects on positive aspects of any factor under study due to influence from increased knowledge and awareness. The present study also showed similar results where women with higher levels of education were physically more active compared to women with lower levels of education. Many research studies have demonstrated similar findings while some have found no association between education and activity levels [16-18].

The effect of employment on the levels of physical activity would now be discussed. Many research studies have evaluated the role of employment on maternal activity levels. The results depicted varied responses. Some studies showed increased physical activity among unemployed pregnant women while some found no association between employment and physical exercises [19,20]. However, it is important to bring out that our study has found a positive association between employment and physical activity among the pregnant women. Meanwhile it also becomes necessary to further explore and determine the nature of activity of the employed pregnant women.

Physical activity level of women is also influenced by number of family members and parity. Interestingly, this study found higher mean rank of physical activity scores among pregnant women with four members in family. The physical activity showed a decreasing trend with increase in number of family members. First time mothers had lower levels of activity and higher parity also decreased activity levels of pregnant women. Many other studies have shown similar results [21]. The possible explanation of fear of miscarriage during first pregnancy could be a reason for decreased activity levels.

Research studies have consistently found a positive association between higher levels of activity during pregnancy and average income levels [22]. The mean activity levels gradually decrease with both higher and lower incomes. Our study too found highest mean score of physical activity among the 10000 SR to 15000 SR range with decreasing levels at both the ends.

Many studies have found that sedentary lifestyle may lead to caesarean mode of delivery, while some studies have even shown insignificant association [23,24]. However, the present study obtained a lower mean rank for physical activity score among the C-section group of subjects indicating that lower activity levels may be associated with the risk of delivery by caesarean method. But this should be further assessed by in depth analysis of various other factors like physical, genetic, previous obstetric history, dietary factors to negate confounding.

The present study showed that there is no evidence of association between physical activity during pregnancy and preterm birth while other studies too have reported no protective effect of the physical activity on premature birth [25,26]. On the other hand, one study showed that women who were engaged in some kind of exercise while being pregnant were less likely to give birth before term than women who did not engage themselves in physical exercise.

Another significant finding and an important point of discussion is the relation between gestational diabetes and physical activity levels of women during pregnancy. Many studies have found a positive association between sedentary life and gestational diabetes or gestational weight gain [5]. Our results also found a significant association between lower mean score of physical activity with the subjects having gestational diabetes. With escalating global prevalence of diabetes, this is an important area of study and hence further studies must be planned to evaluate all the factors leading to gestational diabetes and maternal weight gain during pregnancy, in order to plan specific prevention programs and strategies.

Other maternal complications like pre-eclampsia was reportedly higher in the active group in our study while it has been reported from other studies that performing regular and prescribed physical activity reduces the risk of developing pre-eclampsia [27]. This could probably be a consequence of smaller sample of subjects who reported to have suffered from pre-eclampsia which resulted in the inconclusive results, thus indicating the need for larger studies. The role of health professionals providing antenatal care is important in advising and motivating women to perform physical activity during pregnancy. However, in the current study the support and advice was limited. Women who reported that their physician did not advise them were two times more than women who reported that they received the advice. This is consistent with other studies [28].

LIMITATIONS

Recall bias is one of the limitations which the study encountered as some of the study participants from the paediatric clinic had to be interviewed three months' post-partum. The selection of the paediatric clinic was a result of lack of participants from the delivery ward during the restricted period of data collection. Another limitation is that birth weight was removed from the neonatal register and this restricted our outcomes. The study participant's daily activity may not be that much accurate.

STRENGTHS

What adds to the strength of the study is the paucity of literature on this important topic in Saudi Arabia. Moreover, using valid questionnaire that has been used in many published research is considered as a point of strength in our research.

CONCLUSION

The present study showed a significant decrease in physical activity levels among most of the pregnant women except the young, educated and the employed. Regarding the health care providers and their advice on health promotion activities, a larger proportion of the subjects did not receive any antenatal advice on recommended physical activity levels. This is a major issue of concern as the required antenatal regimen was not appropriately delivered to the subjects leading to low awareness levels and non-performance of physical activity. Further prospective studies are required to obtain the independent factors related to the pattern of physical activities among pregnant women.

It is recommended that an awareness campaign be formulated and launched targeting the pregnant women highlighting the recommended procedures of physical activity during pregnancy along with other health promotion specifications of pregnancy for the interest of both the mother and the newborn.

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FINANCIAL DISCLOSURE

We have no financial interests related to the material in the manuscript.

REFERENCES

[1] Lee, I-Min., et al. "Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy." *The lancet* 380.9838 (2012): 219-229.

[2] Takito, Monica Yuri, and Maria Helena D'Aquino Benício. "Physical activity during pregnancy and fetal outcomes: A case-control study." *Public Health Magazine* 44.1 (2010): 90-101.

[3] Dumith, Samuel C., et al. "Physical activity during pregnancy and its association with maternal and child health indicators." *Journal of Public Health* 46.2 (2012): 327-333.

[4] Hopkins, Sarah A., et al. "Exercise training in pregnancy reduces offspring size without changes in maternal insulin sensitivity." *Journal of Clinical Endocrinology and Metabolism* 95.5 (2010): 2080-2088.

[5] Yin, Ya-Nan., et al. "Physical activity during pregnancy and the risk of gestational diabetes mellitus: A systematic review and meta-analysis of randomised controlled trials." *British journal of sports medicine* 48.4 (2014): 290-295.

[6] Lokey, Enga A., et al. "Effects of physical exercise on pregnancy outcomes: A meta-analytic review." *Medicine and Science Sports and Exercise* 23.11 (1991): 1234-9.

[7] Artal, R., and O'toole, M. "Guidelines of the American college of Obstetricians and Gynaecologists for exercise during pregnancy and the postpartum period." *British journal of sports medicine* 37.1 (2003): 6-12.

[8] Chasan-Taber, L., et al. "Development and validation of a pregnancy physical activity questionnaire." *Medicine and science in sports and exercise* 36 (2004): 1750-1760.

[9] Duncombe, Dianne, et al. "Factors related to exercise over the course of pregnancy including women's beliefs about the safety of exercise during pregnancy." *Midwifery* 25.4 (2009): 430-438.

[10]Chandonnet, Nadia, et al. "French pregnancy physical activity questionnaire compared with an accelerometer cut point to classify physical activity among pregnant obese women." *PLoS One* 7.6 (2012): e38818.

[11] Zhang, Jun, and David A. Savitz. "Exercise during pregnancy among US women." *Annals of epidemiology* 6.1 (1996): 53-59.
[12] Evenson, Kelly R., Savitz A., and Sara L. Huston. "Leisure-time physical activity among pregnant women in the US." *Paediatric and perinatal epidemiology* 18.6 (2004): 400-407.
[13] Petersen, Ann M., Leet T. L., and Ross C. Brownson. "Correlates of physical activity among pregnant women in the United States." *Medicine and science in sports and exercise* 37.10 (2005): 1748-1753.
[14] Sternfeld, B., et al. "Exercise during pregnancy and pregnancy outcome." *Medicine and science in sports and exercise* 27.5 (1995): 634-640.
[15] Sternfeld, Barbara. "Physical activity and pregnancy outcome." *Sports Medicine* 23.1 (1997): 33-47.
[16] Mudd, Lanay M., et al. "Factors associated with women's perceptions of physical activity safety during pregnancy." *Preventive medicine* 49.2 (2009): 194-199.
[17] Wallace, Arlene M., et al. "Aerobic exercise, maternal self-esteem, and physical discomforts during pregnancy." *Journal of nurse-midwifery* 31.6 (1986): 255-262.
[18] Horns, Phyllis N., et al. "Pregnancy outcomes among active and sedentary primiparous women." *Journal of Obstetric, Gynecologic, & Neonatal Nursing* 25.1 (1996): 49-54.
[19] Pereira, Mark A., et al. "Predictors of change in physical activity during and after pregnancy: Project Viva." *American journal of preventive medicine* 32.4 (2007): 312-319.
[20] Zhang, Jun., and David A. Savitz. "Exercise during pregnancy among US women." *Annals of epidemiology* 6.1 (1996): 53-59.
[21] Chasan-Taber, Lisa, et al. "Correlates of physical activity in pregnancy among Latina women." *Maternal and child health Journal* 11.4 (2007): 353-363.
[22] Bungum, Timothy J., et al. "Exercise during pregnancy and type of delivery in nulliparae." *Journal of Obstetric, Gynecologic, & Neonatal Nursing* 29.3 (2000): 258-264.
[23] Hatch, Maureen C., et al. "Maternal exercise during pregnancy, physical fitness, and fetal growth." *American journal of epidemiology* 137.10 (1993): 1105-1114.
[24] Berkowitz, G. S., et al. "Physical activity and the risk of spontaneous preterm delivery." *The Journal of reproductive medicine* 28.9 (1983): 581-588.
[25] Misra, Dawn P., et al. "Effects of physical activity on preterm birth." *American Journal of Epidemiology* 147.7 (1998): 628-635.
[26] Saftlas, Audrey F., et al. "Work, leisure-time physical activity, and risk of preeclampsia and gestational hypertension." *American journal of epidemiology* 160.8 (2004): 758-765.
[27] Stotland, Naomi E., et al. "Preventing excessive weight gain in pregnancy: how do prenatal care providers approach counseling?." *Journal of Women's Health* 19.4 (2010): 807-814.
[28] Herring, Sharon J., et al. "Addressing obesity in pregnancy: what do obstetric providers recommend?." *Journal of Women's Health* 19.1 (2010): 65-70.