Knowledge, attitude, and practices on exercise among pregnant females attending Al-Wazarat Health Center, Riyadh, Saudi Arabia

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Abstract

Background: The consequences of physical inactivity during pregnancy are one of the major problems among pregnant women in Saudi. To explore the pattern of exercise and to know the beliefs and reasons for not doing physical activity (PA) emphasized the need for conducting this study. This study aimed to improve the level of knowledge and practice of PA among women during pregnancy. Methods: A cross-sectional study was performed using quota sampling Results: 41.62% of pregnant women had high level of physical activity (PA) awareness and practice and 58.37% had a low level of awareness and practice. Statistical difference was found between the two groups in terms of parity, education level, work status, and family income. Pregnant women preferred walking as exercise. They are aware about PA benefits during pregnancy, but perceived that tiredness was the greatest barrier for physical activity. Conclusion: This study recommends conducting well-designed intervention sessions to promote PA awareness and practice among pregnant women, especially those with low education, low income, and low number of children.

Keywords: Exercise, KAP, pregnancy

Introduction

Lifestyle changes with pregnancy. One of the important factor for obesity after pregnancy is lack of physical activity and excessive gestational weight gain, for that, all women of reproductive ages should start regular exercise to help them through the course of pregnancy and delivery. This excessive gestational weight gain is considered as one of the major growing problem among pregnant women in Saudi and worldwide, which is associated with fetal-maternal complications like gestational diabetes, macrocosmic infant delivery, and preeclampsia. 16.4% of pregnant women in Saudi were not doing any exercise and 9.1% had lack of knowledge of its importance. The lifestyle modification program on pregnant women had an impact of cost-effective risk reduction strategy in adverse pregnancy outcome. Pregnant women become anxious and concern regarding the adverse effect of exercise on pregnancy due to the lack of knowledge about particular health risks during pregnancy. The need for educating women to acquire appropriate knowledge will help them to develop effective drive attitude about health during pregnancy. To promote physical activity, one should understand that there is an influence of social and cultural beliefs on it and on the health outcomes consequently. PA during pregnancy is influenced by time constraints or no time, lack of child care or feeling unwell during pregnancy, whereas the factor that encourages physical activity is family support for refreshment and to prevent health problems in future. According to the review of the literature, the most common type of activities performed by pregnant women are walking, swimming, and home gymnastics.

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The American College of Obstetricians and Gynecologists (ACOG) recommends in the absence of either medical or obstetric complications, pregnant women exercise at a moderate level; defined as an exercise of 3-4 metabolic equivalents (METS) or any activity that is equivalent in difficulty to brisk walking, for 30 minutes or more per day on most if not all the days of the week.[11] The Royal College of Obstetricians and Gynecologists (RCOG) suggests that all pregnant women should do aerobic and strength-conditioning exercise starting with 15 min of continuous exercise 3 times a week increasing gradually to 30 min 4 times a week and then daily. On the contrary to recommendations and regulations, statistics show that the great majority of pregnant women remain inactive or insufficiently active, they limit their physical activity during pregnancy.[12] For that, primary care providers play an influential role for promoting physical activity among pregnant women by advice and good counseling. Also, they have an important role to enhance the understanding of the factors that influence positively and negatively the women to do physical activity during pregnancy and the postpartum period.[13]

The family physicians are important providers of care that contributes to the health and wellbeing of women throughout the perinatal period and beyond. This paper focuses on the exploration of the pattern of exercise, reasons and beliefs about exercise and its safety among pregnant women.

**Aim**
To improve the level of knowledge and practice of exercise among pregnant women.

**Research question**
What is the pregnant women’s knowledge regarding exercise practice?

How often pregnant women are doing regular exercise?

What are the barriers that pregnant women face for exercise?

**Objectives**
- To assess the level of knowledge of exercise among pregnant women
- To determine the prevalence of exercise among pregnant women
- To identify the barriers for exercising.

**Materials and Methods**

**Study site and population**
The study participants were all healthy literate pregnant women who were of the child bearing age (15–49), attending antenatal clinic in Al-Wazarat Health Center at Riyadh, which is one of the primary health care centers in the Prince Sultan Military Medical City in Riyadh, Saudi Arabia. This center is considered one of the largest primary health centers in the Middle East and it has about 30 clinics that provide health care to a large number of people.

**Study design**
Cross-sectional study was done with quantitative approach through self-administered questionnaire to estimate the prevalence.

**Sample size and sampling technique**
Since there are limited studies that have examined this topic in Saudi Arabia, the sample size was calculated based on the following criteria: the total number of people, margin of error ($\sigma^2$), $P$ value of 0.05, statistical power of 80%, and 95% confidence interval. Using the electronic calculator of Epi-info, the following formula can be used in order to measure the Sample size:

$$N = \frac{Z^2 \cdot \frac{P(1-P)}{e^2}}{}$$

In the formula, $N$ represents the sample size, $Z$ represents the statistic for a level of confidence for 95% confidence, $e$ represents the absolute precision $>3$, and $P$ represents the expected prevalence of insufficient level of awareness, which was estimated to be around 12.75 on an average between two references. Using the formula above,

Four hundred and seventy-two women were eligible for the study. Quota sampling was performed among pregnant women at an antenatal screening room who fitted the criteria.

**Exclusion criteria**
- Illiterate
- Significant cardiac disease
- Restrictive lung disease
- Cervical insufficiency
- Multiple gestations
- Placental abruption
- Placenta previa
- Premature labor
- Ruptured fetal membranes
- Preeclampsia, gestational hypertension.

**Study variables**

**Study tool**
The questionnaire was a structured self-administered based on the review of literature. The assessment of knowledge was based on the recommendation from the Royal college of Obstetricians and Gynecologists (RCOG); that suggests all pregnant women participate in aerobic and strength-conditioning exercise started by 15 min of continuous exercise 3 times a week, increasing gradually to 30 min sessions 4 times a week to daily. The questionnaire was used to measure the level of knowledge and practice of a pregnant woman in an ordinal scale with a possible range of 1–24. The more questions that a pregnant woman answers correctly, the higher the awareness she has about
physical activity. Pregnant women who scored in the range of 0–12 were considered to have a low level of awareness, whereas who scored in the range of 13–24 was considered to have a high level of awareness. Each question had the same score; the one answered correctly scored 1 point and those which were incorrect and unanswered scored 0.

The questionnaire had 3 main parts:
- Questions related to the socio-demographic characteristics
- Questions related to physical activity and exercise practice.
- Questions related to knowledge, benefits, and barriers of physical activity.

The questionnaire was first written in Arabic and then translated to English using a back-translation technique, a bilingual translator first translated the Arabic version of the questionnaire to English then a second bilingual translator back-translated it to Arabic language. Then, the questionnaire was reviewed by 3 expert consultants of family and community medicine and 1 statistician to evaluate its content and face validity; a content validity index was then created.

The reliability of the questionnaire then was examined using a test-retest technique by conducting a pilot study. Accordingly, it was given to 15 volunteers who were chosen by convenient sampling from Al-Wazarat health center (WHC) that involved doctors, nurses, and clerks. The questionnaire was re-administered after 10 days to the same target to assess its reliability.

**Data analysis**

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 12.0. Descriptive analysis was done by developing frequency distribution and charts, whereas analytical statistics was done using the Chi-square test for significant relationship between the awareness and practice of physical activity.

**Ethical consideration**

Ethical approval to carry out the study was obtained from the research committee of Prince Sultan Military Medical City. Verbal consent was taken before participation, and filling of the questionnaire was considered as a written consent.

**Results**

This study was conducted in WHC to describe the characteristics and to enhance maternal awareness regarding physical activity among pregnant women.

Out of a total of 472 participants, 30 were excluded from the analysis due to incomplete information.

Demographic data are presented in Table 1.

The majority of the pregnant women were multiparous (67.4%), of the age 20–29 years old (59.9%), university educated (48.2%),

| Table 1: Demographic Characteristics of Participants (n=442) |
|-------------------------------------------------------------|
| **Characteristics** | **No (442)** | **Percentage** |
| **Age**          |              |                |
| 15-19            | 14           | 3.2           |
| 20-24            | 112          | 25.3          |
| 25-29            | 153          | 34.6          |
| 30-34            | 108          | 24.4          |
| 35-39            | 46           | 10.4          |
| 40+              | 9            | 2.0           |
| **Gestational Age** |              |                |
| 1-13             | 112          | 25.3          |
| 14-28            | 184          | 41.6          |
| 29-40            | 113          | 25.6          |
| Don't Know       | 33           | 7.5           |
| **Number of Children** |          |                |
| First Pregnancy  | 144          | 32.6          |
| 1-3              | 224          | 50.7          |
| 4-6              | 66           | 14.9          |
| >6               | 8            | 1.8           |
| **Educational Level** |          |                |
| Read and Write/Primary | 33 | 7.5       |
| Intermediate/Secondary | 196 | 44.3    |
| University & above | 213 | 48.2     |
| **Occupation**   |              |                |
| Health Care Worker | 5        | 1.1         |
| Teacher          | 63           | 14.3          |
| Clerk            | 21           | 4.8           |
| Housewife        | 332          | 75.1          |
| Others           | 21           | 4.8           |
| **Do you have house-maid?** | |        |
| No               | 400          | 90.5          |
| Yes              | 42           | 9.5           |
| **Family income**|              |                |
| <5000            | 132          | 29.9          |
| 5000-10000       | 261          | 59.0          |
| >10000           | 49           | 11.1          |

Housewives (75.1%), had family income from 5,000 to 10,000 Saudi Riyals (59%), and had housemaid (9.5%).

Overall, 41.6% of pregnant women had high level of awareness (HLA) about knowledge and practice of physical activity during pregnancy and 58.4% of them had low level of awareness (LLA).

A statistical significant difference was found between pregnant women with high and low level of awareness and practice in terms of the number of children ($\chi^2 = 4.19$, $P < 0.05$) most pregnant women were multiparous (LLA 63.6% and HLA 72.8%).

No significant difference was found between pregnant women with high and low level of awareness and practice in terms of age, gestational age, and presence of housemaid ($P > 0.05$).
A statistical difference was additionally found between pregnant women with LLA and HLA in terms of their level of education ($\chi^2 = 12.7, P < 0.05$). The high level of awareness and practice of physical activity were noticed in pregnant women who had high education level (LLA 41.9% and HLA 57.1%).

A statistical difference was found between pregnant women with LLA and HLA in terms of their work status ($\chi^2 = 3.7, P < 0.05$), among the pregnant women who were not working (70.7% with HLA and 78.7% with LLA.) Another statistical difference was found between pregnant women with LLA and HLA in terms of their family income ($\chi^2 = 12.97, P < 0.05$). Sixty-four percent of pregnant women with HLA and 55.4% of them with LLA had a monthly income from 5000 to 10000 SR. Twenty-one percent of pregnant women with HLA and 36% of them with LLA had monthly income less than 5000SR. [see Table 2].

**Level of knowledge about exercise in pregnant women**

Overall, 49.32% of pregnant women had low level of knowledge about PA and 50.67% of pregnant women had high level of knowledge about PA.

A statistical difference was found in pregnant women with high and low level of knowledge in terms of their education level ($\chi^2 = 16.673, P < 0.05$), the highest level of knowledge was notice in pregnant women with university degree (56.7% had high level of knowledge and 39.4% had low level of knowledge). Another statistical difference was found in pregnant women in terms of their work-status ($\chi^2 = 3.739, P < 0.05$) 71.4% of pregnant women with high level of knowledge and 79.4% had low level of knowledge were not working.

In addition, statistical difference was found in terms of their family income ($\chi^2 = 13.595, P < 0.05$), 60.3% of pregnant women with high level of knowledge and 57.8% of pregnant women with low level of knowledge had a monthly income between 5000-10000SR [see Table 3].

Seventy-five percent of pregnant women reported walking as suitable exercise during pregnancy, 65.6% of pregnant women with low level of knowledge and 85.7% of pregnant women with high level of knowledge reported walking as a suitable exercise during pregnancy ($\chi^2 = 24.37, P < 0.05$). Thirty-seven percent of pregnant women with low level of knowledge and 54% of pregnant women with high level of knowledge reported relaxation as suitable exercise during pregnancy with 45.7% ($\chi^2 = 12.658, P < 0.05$). Another significant difference was found between two groups ($\chi^2 = 62.664, P < 0.05$) in which 7.3% of pregnant women with low level of knowledge and 39.3% of pregnant women with high level of knowledge reported swimming as one of the safety physical exercise during pregnancy [Table 4].

**Level of awareness regarding benefits and risk of physical activity during pregnancy**

Majority of pregnant women (69.9%) reported one of the benefits of physical activity was to reduce lower limb edema and attenuation of gestational diabetes, 68.3% reported limitation of pregnancy weight gain with PA. Similarly, 62.9 and 61.1 reported PA as attenuation of gestational hypertension and decrease medical interventions respectively, whereas 33.5% reported PA as risk for musculoskeletal injuries during pregnancy. Forty-four percent and 48.2% of pregnant women didn’t know if the PA increase risk of hypoglycemia and preterm delivery or decrease, respectively. Almost thirty percent of pregnant women reported PA to had negative risk on fetal growth. Forty-five percent of pregnant women reported PA reduces varicose veins.

Overall, a significant difference was found between the two groups in their level of awareness about the benefits and risk of PA. Forty-three percent of pregnant women with LLA and 56.1% of pregnant women with HLA were aware about the benefits and risk of PA. Furthermore, 84% of pregnant women with low level of awareness about benefits and risk of PA were not working ($\chi^2 = 14.025, P < 0.05$). Most of working pregnant women with high level of knowledge about PA benefits and risk were clerks. This was a statistically significant difference ($\chi^2 = 18.324, P < 0.05$), [Tables 5 and 6].

**Level of exercise practice among pregnant women**

The majority of pregnant women (84.2%) reported that they were not able to do any physical activity. Sixty percent of pregnant women with low physical activity (LPA) were primigravida, and 40% of them were multiparous, whereas 30.9% of them with high physical activity (HPA) were primigravida, and 69.1% were multiparous; with significant difference was found ($\chi^2 = 9.071, P < 0.05$).Overall, no other significant difference was in exercise practice among pregnant women [Table 7].

**Reasons for physical inactivity among pregnant women**

Eighty-three percent of pregnant women with low level of physical activity (LLPA) and 85.3% of pregnant women with high level of physical activity (HLPA) reported feeling tired as the first barrier, thus no significant difference was found between the two groups. About 89.6% of pregnant women who reported feeling tired had LPA and 10.4% had HLPA were primigravida, with significant difference ($\chi^2 = 4.37, P < 0.05$), 88.3% of pregnant women with LPA and 11.7% of pregnant women with HLPA were high educated, with significant difference ($\chi^2 = 6.584, P < 0.05$).

A significant difference was found between two groups ($\chi^2 = 4.953, P < 0.05$) in which 41.5% of pregnant women with LLPA and 52.2% of pregnant women with HLPA reported no access for facilities (45.9%).
Twenty-four percent of pregnant women who reported transportation problems as barrier had 20.5% had LLPA and 29.3% had HLPA, a significant difference was found ($\chi^2 = 4.538$, $P < 0.05$). Thirty-two percent of pregnant women had an income $> 10000SR$ and 16.7% of them were under $5000SR$ ($\chi^2 = 6.703$, $P < 0.05$).

Moreover, time availability was one of the barriers (24.7%) in 23.6% of pregnant women with LLPA and 26.1% of pregnant women with HLPA with a significant difference ($\chi^2 = 8.105$, $P < 0.05$). 89.6% of pregnant women who reported feeling tired had LLPA and 10.4% had HLPA were primigravida, with significant difference ($\chi^2 = 4.37$, $P < 0.05$). Among the pregnant women who reported no time...
65.14% of them were housewife and 34.86% were working, with significant difference ($\chi^2 = 10.485, P < 0.05$).

Not knowing the importance was reported as one of the PA barriers in 20.4%, 25.2% of pregnant women with LLPALLPA and 13.6% with HLPA reported not knowing the importance as one of the barrier. This was also statistically significant difference ($\chi^2 = 8.923, P < 0.05$).

Some pregnant women perceived that financial issues as barrier for PA 7.5% with LLPALLPA and 8.8% with HLPA respectively, however, this was not a statistically significant difference [Table 8].

Discussion

This study included 442 participants attending ANC at Wazarat health center. Main findings were, majority of them (84.2%) reported not performing PA during pregnancy, and most of those who performed PA were multiparous. Regarding the level of knowledge about PA, most participants in this study (50.67%) had high level of knowledge. No statistical significant relationship

### Table 3: level of Knowledge vs demographic characteristics ($n=442$)

| Characteristics          | No Knowledge | Chi square | P    |
|--------------------------|--------------|------------|------|
|                         | Low level (218) | High level (224) |      |      |
|                         | No | Percentage | No | Percentage |      |      |
| Age                     |    |            |    |            |      |      |
| 15-19                    | 14 | 7 | 3.2 | 7 | 3.1 | 3.541 | 0.617 |
| 20-24                    | 112 | 57 | 26.1 | 55 | 24.6 |      |      |
| 25-29                    | 153 | 67 | 30.7 | 86 | 38.4 |      |      |
| 30-34                    | 108 | 57 | 26.1 | 51 | 22.8 |      |      |
| 35-39                    | 46 | 26 | 11.9 | 20 | 8.9 |      |      |
| 40+                      | 9 | 4 | 1.8 | 5 | 2.2 |      |      |
| Gestational Age          |    |            |    |            |      |      |
| 1-13                     | 112 | 63 | 28.9 | 49 | 21.9 |      |      |
| 14-28                    | 184 | 85 | 39.0 | 99 | 44.2 |      |      |
| 29-40                    | 113 | 52 | 23.9 | 61 | 27.2 | 3.724 | 0.293 |
| Don’t Know               | 33 | 18 | 8.3 | 15 | 6.7 | 13.595 | 0.001 |
| Number of Children       |    |            |    |            |      |      |
| Primigravida             | 144 | 68 | 31.2 | 76 | 33.9 | 0.376 | 0.539 |
| Multiparous              | 298 | 150 | 68.8 | 148 | 66.1 |      |      |
| Educational Level        |    |            |    |            |      |      |
| Read and Write/Primary   | 33 | 24 | 11.0 | 9 | 4.0 |      |      |
| Intermediate/Secondary   | 196 | 108 | 49.5 | 88 | 39.3 | 16.673 | 0.000 |
| University & above       | 213 | 86 | 39.4 | 127 | 56.7 |      |      |
| Working status           |    |            |    |            |      |      |
| Working                  | 109 | 45 | 20.6 | 64 | 28.6 | 3.739 | 0.053 |
| Not working              | 333 | 173 | 79.4 | 160 | 71.4 |      |      |
| Do you have house-maid?  |    |            |    |            |      |      |
| No                       | 400 | 204 | 81.6 | 196 | 47.0 | 4.746 | 0.029 |
| Yes                      | 42 | 14 | 56.0 | 28 | 6.7 |      |      |
| Family income            |    |            |    |            |      |      |
| <5000                    | 132 | 78 | 35.8 | 54 | 24.1 |      |      |
| 5000-10000               | 261 | 126 | 57.8 | 135 | 60.3 | 13.595 | 0.001 |
| >10000                   | 49 | 14 | 6.4 | 35 | 15.6 |      |      |

### Table 4: level of knowledge about the type of exercise

| Exercise       | No | Opinion about exercise | Chi square | P    |
|----------------|----------------|-------------------------|------------|------|
|                | No | Percentage  | No | Percentage |      |      |
| Walking        | 335 | 143 | 65.6 | 192 | 85.7 | 24.371 | 0.000 |
| Swimming       | 104 | 16 | 7.3 | 88 | 39.3 | 62.664 | 0.000 |
| Aerobic        | 6 | 2 | 0.9 | 4 | 1.8 | 0.621 | 0.686 |
| Relaxation     | 202 | 81 | 37.2 | 121 | 54.0 | 12.658 | 0.000 |
between level of knowledge and level of practice was found. Factors such as number of children, level of education, work status, and family income were statistically related to the level of knowledge about PA. The main barriers to PA during pregnancy were feeling tired, lack of access, and no time.

Regular physical activity (PA) is a new attention for health care providers to maintain social, emotional, and physical health balance. Majority of adult are inactive at the recommended level of PA guidelines. Pregnant women in Saudi have high prevalence of excessive gestation weight gain. This is due to poor knowledge about this particular health risk during pregnancy.

There have been few studies and this study is one of it, that is concern on PA during pregnancy among pregnant women in Saudi, assessment of their knowledge on the PA guidelines and to explore the reasons behind physical inactivity.

### Table 5: Opinion regarding the benefits and risks of exercise

| Characteristics                          | No   | Percentage | Don't know | No   | Percentage | Yes  | Percentage |
|-----------------------------------------|------|------------|------------|------|------------|------|------------|
| Limit Pregnancy weight gain             | 68   | 15.4       | 72         | 16.3 | 302        | 68.3 |           |
| Reduce Lower Limb edema                 | 43   | 9.7        | 90         | 20.4 | 309        | 69.9 |           |
| Attenuation of gestational diabetes mellitus | 37   | 8.4        | 96         | 21.7 | 309        | 69.9 |           |
| Attenuation of gestational hypertension | 30   | 6.8        | 134        | 30.3 | 278        | 62.9 |           |
| Reduce medical interventions during labor | 44   | 10.0       | 128        | 29.0 | 270        | 61.1 |           |
| Increase risk of musculoskeletal injury e.g. Acute strais and tears | 119  | 26.9       | 175        | 39.6 | 148        | 33.5 |           |
| Decrease risk of hypoglcrmia            | 43   | 9.7        | 198        | 44.8 | 201        | 45.5 |           |
| Decrease risk of preterm delivery       | 93   | 21.0       | 213        | 48.2 | 136        | 30.8 |           |
| Decrease risk of fetal growth           | 231  | 52.3       | 154        | 34.8 | 57         | 12.9 |           |
| Decrease risk of varicose vein          | 48   | 10.9       | 193        | 43.7 | 201        | 45.5 |           |

### Table 6: Level of awareness regarding benefits and risk as per demographic characteristics (n=442)

| Characteristics                  | LLA (194) | HLA (248) | Chi square | P     |
|----------------------------------|-----------|-----------|------------|-------|
| **Opinion about Benefits**       | No        | Percentage| No         | Percentage|
| Age 15°19                        | 14        | 9         | 4.6        | 5     | 2.0 |
| 20-24                            | 112       | 64        | 33.0       | 48    | 19.4|
| 25-29                            | 153       | 66        | 34.0       | 87    | 35.1|
| 30-34                            | 108       | 36        | 18.6       | 72    | 29.0|
| 35-39                            | 46        | 16        | 8.2        | 30    | 12.1|
| 40+                              | 9         | 3         | 1.5        | 6     | 2.4 |
| Gestational Age                  |           |           |            |       |     |
| 1-13                             | 112       | 47        | 24.2       | 65    | 26.2|
| 14-28                            | 184       | 86        | 44.3       | 98    | 39.5|
| 29-40                            | 113       | 44        | 22.7       | 69    | 27.8|
| Don't Know                       | 33        | 17        | 8.8        | 16    | 6.5 |
| Number of Children               |           |           |            |       |     |
| Primigravida                     | 144       | 70        | 36.1       | 74    | 29.8|
| Multiparous                      | 298       | 124       | 63.9       | 174   | 70.2|
| Educational Level                |           |           |            |       |     |
| Read and Write/Primary           | 33        | 17        | 8.8        | 16    | 3.8 |
| Intermediate/Secondary           | 196       | 100       | 51.5       | 96    | 23.0|
| University & above               | 213       | 77        | 39.7       | 136   | 32.6|
| Working status                   |           |           |            |       |     |
| Working                          | 109       | 31        | 16.0       | 78    | 18.7|
| Not working                      | 333       | 163       | 84.0       | 170   | 40.8|
| Do you have house-maid?          |           |           |            |       |     |
| No                               | 400       | 178       | 91.8       | 222   | 89.5|
| Yes                              | 42        | 16        | 8.2        | 26    | 10.5|
| Family income                    |           |           |            |       |     |
| <5000                            | 132       | 70        | 36.1       | 62    | 25.0|
| 5000-10000                       | 261       | 101       | 52.1       | 160   | 64.5|
| >10000                           | 49        | 23        | 11.9       | 26    | 10.5|

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Table 7: Practice as per Socio-demographic (n=442)

| Characteristics          | No  | Percentage | Practice | Chi square | P  |
|--------------------------|-----|------------|----------|------------|----|
|                          | <50% (25) |            | 50% + (417) |            |
| Age                      | No   | Percentage | No   | Percentage |    |
| 15-19                    | 14   | 0.0        | 14   | 3.4        |    |
| 20-24                    | 112  | 7.0        | 105  | 25.2       |    |
| 25-29                    | 153  | 9.0        | 144  | 34.5       | 1.534  | 0.909 |
| 30-34                    | 108  | 6.0        | 102  | 24.5       |    |
| 35-39                    | 46   | 3.0        | 43   | 10.3       |    |
| 40+                      | 9    | 0.0        | 9    | 22.2       |    |
| Gestational Age          | No   | Percentage | No   | Percentage |    |
| 1-13                     | 112  | 7.0        | 105  | 25.2       |    |
| 14-28                    | 184  | 8.0        | 176  | 42.2       | 1.455  | 0.693 |
| 29-40                    | 113  | 7.0        | 106  | 25.4       |    |
| Don't Know               | 33   | 3.0        | 30   | 7.2        |    |
| Number of Children       | No   | Percentage | No   | Percentage |    |
| First Pregnancy          | 144  | 15.0       | 129  | 30.9       |    |
| 1-3                      | 224  | 7.0        | 217  | 52.0       | 9.437  | 0.024 |
| 4-6                      | 66   | 3.0        | 63   | 15.1       |    |
| >6                       | 8    | 0.0        | 8    | 1.9        |    |
| Educational Level        | No   | Percentage | No   | Percentage |    |
| Read and Write/Primary   | 33   | 2.0        | 31   | 7.4        |    |
| Intermediate/Secondary   | 196  | 11.0       | 185  | 44.4       | 0.011  | 0.995 |
| University & above       | 213  | 12.0       | 201  | 48.2       |    |
| Occupation               | No   | Percentage | No   | Percentage |    |
| Health Care Worker       | 5    | 0.0        | 5    | 1.2        |    |
| Teacher                  | 63   | 7.0        | 56   | 13.4       |    |
| Clerk                    | 21   | 1.0        | 20   | 4.8        | 4.312  | 0.365 |
| Housewife                | 332  | 16.0       | 316  | 75.8       |    |
| Others                   | 21   | 1.0        | 20   | 4.8        |    |
| Do you have house-maid?  | No   | Percentage | No   | Percentage |    |
|                          | 400  | 20.0       | 380  | 91.1       | 3.396  | 0.065 |
|                          | 42   | 5.0        | 37   | 8.9        |    |
| Family income            | No   | Percentage | No   | Percentage |    |
| <5000                    | 132  | 6.0        | 126  | 30.2       |    |
| 5000-10000               | 261  | 13.0       | 248  | 59.5       | 4.515  | 0.105 |
| >10000                   | 49   | 6.0        | 43   | 10.3       |    |

Pregnancy is an essential and critical period to regulate the body weight, for maternal and fetal health and could be the beginning of behavioral changes. Physical activity patterns change with pregnancy. Many studies recommend health care provider to inculcate among all pregnant women that PA is safe and beneficial for health purpose and weight control.

The present study showed that 58.4% of pregnant women had an overall low level of PA awareness and practice. Although 50.67% of pregnant women who had high level of knowledge about PA, only 15.8% of them were exercising well. Indeed, a study in the United States showed that 32% of pregnant women were to meet the level of physical activity guidelines during early pregnancy, and this number declined to 12% by late pregnancy.[7] However, most of the sample, pregnant women had high education levels. This LLPA reported in the gulf countries including Saudi Arabia, was more prominent in women as compared to men.[9] For that, the clinicians play a main role in advising. To change a behavior is not easy, it is long and slow process and requires patience. LLPA in young and pregnant women is enhanced by sedentary life and changed behavior.[17] Almost half of the pregnant women in this study had a good level of knowledge about PA. This could be attributed to the study population being in an urban setting, and therefore have access to many forms of information. Furthermore, antenatal program in WHC provides integrated health care services to pregnant women to enhance their education and enrich their knowledge. This program is accessible and affordable. As shown in other studies, the health education develops effective drive attitudes.[5]

This gap in the knowledge is one of the most important determinants of physical inactivity status.[8,13] Therefore, health care provider should consider improving maternal awareness and enrich their knowledge by educating pregnant women about the benefits of PA. Besides the social norms and traditions pregnant
women in Saudi may inherit the culture of physical inactivity that
is away from scientific base, incorrect information or insufficient
and inadequate information is obtained from health providers
regarding PA during pregnancy.[7,8]

The role of health care providers should be considered for
promoting PA during pregnancy and post partum and improve
their fitness by accurate information and by conducting sessions
for PA during antenatal visits, at least once per trimester by a
specialist, and to be updated to the appropriate PA in each phase
of pregnancy and thus decrease the risk of injuries and metabolic
disturbance. Personal advice, offering program choice for exercise
and supervision are considered as successful support options to
improve PA among pregnant women.[9] This is consistent with
a study by Chan et al.[20] Implantation of PA intervention among
pregnant women has a positive effect on maternal and fetal health.

But most of the time, women will be guided by their own
beliefs and reasons to do something. Women feel that healthy
eating is more important than being physically active during
pregnancy.[21] For pregnant women, the present study showed to
have good awareness about PA benefits during pregnancy and
the appropriate practice of PA. Also, beliefs about baby’s harm
from PA existed. About 43.9% of pregnant women had LLA
and 56.1% of pregnant women had HLA about benefits and risk
of PA. Different beliefs of pregnant women are mostly due to
derivation level.[7,20,21] These are consistent with the study’s finding
that 32.6% of pregnant women with high level of knowledge
about benefits of PA and 39.7% of pregnant women with low
level of knowledge about benefits of PA had high education level.

In another way, 54.8% of pregnant women who had high level
of knowledge were highly educated. Also, 84% of pregnant
women with low level of knowledge about benefits of PA and
risk were not working, whereas 16% of them were working.
Unfortunately no previous study was conducted in the same
field for comparison.

The result showed that among 442 participants only 15.8% of
pregnant women in Saudi were exercising. One of the beliefs for
being physically active during pregnancy was to minimize gestational
weight gain and facilitate return back to pre pregnancy body weight.[23]

However, there is statistically significant decrease in PA during
pregnancy.[20] Most of women worldwide stop exercising after
discovering that they are pregnant and only a few begin to exercise
during pregnancy.[21,22]

Most of the reasons given by participants showed that feeling
tired by 84.4%. Although most of pregnant women knew the
importance of PA, about 83.7% of pregnant women with LLA
and 85.3% of pregnant women with HLA considered feeling
tired as the first barrier (89.6% of pregnant women who had
LLA and 10.4% had HLA were primigravida).

Some other factors were reducing PA among pregnant women.
About 45.9% of pregnant women reported no access for
facilities (41.5% of pregnant women with LLA and 52.2% of
pregnant women with HLA). About 24.2% of pregnant women
who reported transportation problems as barrier had 20.5%
LLA and 29.3% HLA. As women in Saudi can’t drive own car
as Saudi community is male dominant. The lack of time was one
of the barriers (24.7%) in 23.6% of pregnant women with LLA
and 26.1% of pregnant women with HLA. Pregnant women
who reported no time 65.14% of them were housewives, and
had role of care giving and 34.86% were working. Not knowing
the importance was reported to be one of the PA barriers in
20.4%, 25.2% of pregnant women had LLA and 13.6% had
HLA. However, the results of the study are not different
from the previous studies about the reasons for LLA among
pregnant women in Saudi.[23] Just as other study, internal barriers
to PA among pregnant women were lack of energy and feeling
uncomfortable due to size, and the most common personal
health problems were associated with physical inactivity. Whereas,
working was the most external barrier to PA.[23]

Generally, women in Saudi Arabia had limited opportunities to
attend health centers including lack of motivation for PA, low
income, work load at home and care giving role.[8,13] In addition,
lack of facilities and the distance was the greatest barrier for PA.[9]

In developed countries, PA is more often recorded among
pregnant women who are younger than 35 year old, have low
level of education, multiparity, and low level of pre-pregnancy
exercise.[24] The presence of housemaid contributes to LLA.[8]

| Table 8: Barriers of not performing physical exercise (n=442) |
|------------------------------------------------------------|
| **Barriers** | **No** | **Chi square** | **P** |
| | **<50% (258)** | **Percentage** | **50% + (184)** | **Percentage** |
| Feeling tired | 373 | 216 | 83.7 | 157 | 85.3 | 0.210 | 0.647 |
| Doesn’t like | 39 | 27 | 10.5 | 12 | 6.5 | 2.076 | 0.150 |
| No time | 109 | 61 | 23.6 | 48 | 26.1 | 0.345 | 0.557 |
| Not knowing the importance | 90 | 65 | 25.2 | 25 | 13.6 | 8.923 | 0.003 |
| Transportation problems | 107 | 53 | 20.5 | 54 | 29.3 | 4.538 | 0.033 |
| Just do it in last month (9th month) of pregnancy | 106 | 68 | 26.4 | 35 | 19.0 | 1.917 | 0.166 |
| No access for facilities (no near gym or garden) | 203 | 107 | 41.5 | 96 | 52.2 | 4.953 | 0.026 |
| Financial Issues | 33 | 18 | 7.0 | 15 | 8.2 | 0.215 | 0.643 |
Furthermore, demographic factors such as age, education level, family income, beliefs and knowledge about PA have been documented as determinants of individual activity.

**Limitations**

The sample frame which involved all pregnant women who were attending WHC-Riyadh limits the generalization of the finding. The method of data collection is less costly and effective in recruiting a large number of participants; it increases the threat of validity. In addition, there was insufficient explanation about different women's beliefs about PA.

**Conclusion**

In conclusion, this study provides a baseline for pregnant physical activity. This study shows that there is no correlation between the awareness of PA during pregnancy and practice. The appearance of sufficient knowledge among pregnant women doesn't reflect well practice of exercise. Therefore, feeling tired or lack of facilities is the major barriers to PA. It is important to understand the factors and beliefs that affect PA. For that, antenatal programme care should restructure and design specific strategies to promote PA among pregnant women.

More studies are required for determining the best available interventions to enhance PA during pregnancy and to clarify the reasons behind the women's disbeliefs about PA and to overcome the barriers.

**Recommendation**

The first step to improve the level of PA awareness and practice among pregnant women is by establishing maternity PA sessions for education and intervention.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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