



The Relationship between Cognitive Social Theory and Physical Activity in Pregnant Women

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Abstract

Background

Although following a suitable sports program with mild intensity promoted the health of mother's who had healthy pregnancy and caused no harm to the growing fetus; pregnant women usually choose to live a sedentary life. This study was conducted to determine the psychological factors related to physical activity in pregnant women.

Materials and Methods

This descriptive, correlational and cross-sectional study was conducted on 201 pregnant women who referred to Isfahan health center, Iran. Data gathering tools included a questionnaire on physical activity during pregnancy and a questionnaire to evaluate variables related to social cognitive theory. The validity of socio-cognitive questionnaires was approved by expert professors and their reliability was approved using internal consistency and Cronbach's alpha (above 0.6). Data were analyzed using SPSS software (version 16.0) through descriptive statistics, correlation coefficient test and linear regression.

Results: The greatest amount of physical activity was related to activities in a moderate level. The results showed that there was a significant relationship between three variables of socio-cognitive theory and several levels of physical activity. There was also a significant relationship between variable of observational learning and physical activity in a moderate level and total activity ($P < 0.05$) and a significant relationship between variable of social norms with all three levels of physical activity and total activity. Furthermore, there was a significant relationship between outcome expectations and inactivity ($P < 0.05$)

Conclusion: Among the variables related to social cognitive theory, social norms as one of the environmental factors in interaction of the individual, the behavior and environment could be used to analyze the physical activity during pregnancy. Suitable interference focusing on social norms to promote physical activity in pregnant women should be considered.

Key Words: Iran, Physical activity, Pregnancy, Social cognitive theory.

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1- INTRODUCTION

One of the most important life periods of a woman is pregnancy period which is considered as an enjoyable and evolutionary event for women (1). The importance of pregnancy period is that better living conditions of mother has direct effect on embryo life, so that behaviors of healthy life style help to promote the health while behaviors of unhealthy life style have harmful effects on the health of mother and fetus (2). According to estimations of the World Health Organization (WHO); lack of physical activity has been the cause of 6% (3.2 million of deaths) of deaths worldwide (3). On one hand, technological development and mechanical lifestyle has reduced physical activity of humans consequently leading to the 70% of diseases infections due to inactivity, while on the other hand physical activity and regular exercise have very important roles in maintenance and promotion of health (4). Researches have shown that exercise and physical activities in women will have deep effect on pregnancy, breastfeeding and also health in old age (5). Repeated physical activity can be considered as a complementary treatment method for women with diabetes (6). So that regularly exercising during the first twenty weeks of pregnancy reduces risk of catching pre-eclampsia by 34% (7-9); although following a suitable exercise plan with moderate intensity in women who are experiencing healthy pregnancy leads to promotion of mother's health and does not cause any problem for the growing embryo, but unfortunately pregnant women select low activity life style (7, 10, 11), so that in the United States of America only 15.8% and in Ireland 21.5% of pregnant women participate in sport activities. In Denmark, intensity and time of pregnant women's sport activity have been reduced in the first third months of pregnancy and the completely inactive life

style have been increased 29% (10). The main causes for lack of exercise include fatigue, malaise feeling, extreme occupation and discomfort due to exercise during the final stages of pregnancy; from another perspective, lack of time, lack of energy, concern for embryo and discomfort feeling serve as barriers to frequent exercise during pregnancy (12). One of the preventing factors of physical activity during the pregnancy is cultural beliefs. Although there have not been many studies on pregnant women in terms of habits, psychology and the reasons why they are selective in the physical activities during pregnancy but concerning physical activity, it may be the fear of abortion or adverse effect on the health of the fetus (1). Simon Down and Hozen Blas believe that according to benefits of exercise in pregnancy, it is necessary for health care providers to design some interventions to make these exercises prevalent among mothers (7).

Researchers have shown that the most effective training plans are based on theory-centered approaches which stem from patterns of changing behavior, and selecting a suitable theory pattern of health training is the first step in the process of planning a training program (13). This issue specifies roles of models and theories of studying behavior in health training (14). The gap in evaluating effective psychological factors on pregnancy period under theoretical framework and identified theories during pregnancy period is felt due to environmental, cultural and social differences between Iran and other countries; so that Sargazi et al. believe that each model in health training needs localization (15). For this purpose in the present research, effective psychological factors were determined by using cognitive social theory. Presently, researchers are trying to take a valuable step to provide suitable interventions of promoting health in pregnant women by better identifying

and understanding psychological factors related to conducting physical activity for pregnant women.

2- MATERIALS AND METHODS

The present research is a type of descriptive-correlational and was conducted in a sectional way on 201 women, aged 18-45 years, under pregnancy cares in treatment health centers in Isfahan city, in 2015. Sampling was as stratified random and data collection tool was by completing a self-reported questionnaire. Inclusion criteria were Iranian citizenship, age between 18-45 years old, pregnancy age more than 14 weeks, ability to recall information of past 7 days, without having movement problems or limitations or physician recommendation to movement limitation due to general illnesses or special situation in pregnancy (Placenta previa, vessel previa, cerclage, abortion, infertility, moles, bleeding in the second trimester), without having identified mental-psychological disorders (depression, bipolar disorder) based on health records. In the present research according to its theory-centered being, Bandura's social cognitive theory was used to create and design the scale of environmental factors.

Social learning theory with a principled position was propounded in the beginning of the second half of the twentieth century by a group of psychologists, particularly Albert Bandura, with wide activity and effort (16). Bandura states that "individual factors" including knowledge, perceived self-efficacy and expectation for consequences are related to conducting behavior. These factors include people's beliefs about the amount of self-effectiveness required to have an effective role in changing a person. People's beliefs about effectiveness on self-form the human behavior and motivation foundation. People should believe (or be informed) that they are able to make

change (being active) or be an agent of change. "Behavioral factors" include short-term purposes, long term purposes, environmental factors, barriers and support (threats or opportunities). Variables of cognitive social model are reflections of plans and purposes that people will develop in order act in a certain way in the future. Eventually "environmental factors" that affect behavior include supporters and existing social barriers in line with conducting a certain behavior. Social support is related to quality and quantity of help from others to facilitate and affect person's participation in a certain behavior. Support from others can help to create suitable conditions for change and provide a positive ground for other important behavioral variables (17).

Researcher-made questionnaire to evaluate cognitive social theory included: observational learning, perceived social support, specifications of physical environment, social norms, and expectations of consequence. Validity of the questionnaires was confirmed through external and content validities by related experts, and their reliability was confirmed through retest and calculating reliability index in repeatability dimension and calculating Cronbach's alpha (above 0.6).

Pregnancy Physical activity questionnaire (PPAQ) was used to evaluate the Physical activity and its validity was confirmed by Chazantaber and colleagues; also its reliability was confirmed by in a research by Kazemi and Ahmadi using Cronbach's alpha (0.85) (18). In this questionnaire, questions are divided into three levels of low (9 questions), moderate (12 questions), severe (2 questions) and inactive (5 questions). To calculate the extent of physical activity, the Metabolic Equivalent of Task (MET) amount for the activity of each question (in terms of attached tables) is multiplied by time (in terms of hours) spent on that activity (one day, or within a week), and then the total

of activities are calculated for each level. Activities with less than 1.5 MET are considered as inactive, activities with MET of 1.5 to 3 are regarded as light activity, activities with MET of 3 to 6 are considered as average activities and activities with MET of more than 6 are considered as intense activities. Data was analyzed by using SPSS software (version 16.0) and descriptive statistic, Pearson and Spearman correlation and multivariate linear regression were evaluated ($P < 0.05$).

3- RESULTS

The findings of the research showed that age averages of units under the research and their spouses were, respectively 28.3 ± 4.8 and 32.7 ± 5.2 years old; 82.6% of units under the research were housekeepers and 89.1% of their spouses were employed. Values of

physical activity in units under the research are presented in **Table.1** and relation between structures of cognitive social theory (observational learning, perceived social support, specifications of physical environment, social norms and expectations of consequence) with values of physical activity are presented in **Table.2**. The maximum value of physical activity was related to activities with medium level and there was a significant relation between variable of observational learning with physical activity in medium level ($r=0.17$) and overall activity ($r=0.14$) ($P < 0.05$); also, there was a significant relation between variable of social norms with the three levels of physical activity and overall activity and a significant relation between expectations of consequence and inactivity ($r=0.14$, 0.21 , 0.14 , 0.19) ($P < 0.05$).

Table-1: Determining average of value of physical activity (based on meter in hour in week) in units under the research

Level of activity based on intensity	Mean (standard deviation)	Maximum	Minimum
Inactivity	18.08(6.64)	32.10	3.55
Light activity	40.82(11.45)	70.30	9.42
Medium activity	60.43(33.71)	30.92	0
Intense activity	1.93(2.29)	5.67	0
Total	121.27(46.20)	229.92	17.48

SD: Standard deviation.

Table-2: The correlation of variables of cognitive social theory with value of physical activity

Value of physical activity	Cognitive Social Theory									
	Observational learning		Perceived social support		Specifications of physical environment		Social norms		Expectations of consequence	
	r	P-value	r	P-value	r	P-value	r	P-value	r	P-value
Inactivity	0.07	0.33	-0.03	0.64	-0.06	0.38	0.12	0.08	0.14	0.04
Light activity	0.09	0.16	0.07	0.28	-0.03	0.65	0.14	0.04	0.03	0.63
Medium activity	0.17	0.01	0.10	0.15	0.11	0.12	0.21	0.002	0.12	0.07
Intense activity	0.09	0.18	0.08	0.23	-0.02	0.71	0.14	0.04	0.0	0.94
Total	0.14	0.03	0.10	0.15	0.03	0.61	0.19	0.005	0.06	0.32

r: Spearman test.

4- DISCUSSION

As seen in Table.1; in women under coverage of pregnancy cares the average of value of inactivity is 18.08 MET and the average value of activities with light intensity is equal to 40.83 MET. Also, the average activity with medium intensity is 60.43 MET and average value of intense activities is 1.9 MET. In addition, average physical activity was obtained as 121.2 MET. In this regard, a research conducted by Nascimento et al. (2015) on pregnant women in Brazil reported averages of values of inactivity of 43.2 MET, light activity of 89.3 MET, medium activity of 40.2 MET and intense activity of 0.09 MET. These results indicated that there are more values of inactivity and light activity in Brazilian women and more prevalence of medium and intense activities among women in the present research (19).

Cohen et al. (2013) also in a research conducted in Ottawa to evaluate obesity due to pregnancy, expressed their results as inactivity (84.4), light activity (79.8), medium (58.7), and intense (1.8), so that values of inactivity and light activity in Tamara Cohen's research were much higher than the results of the present research (20). In another research on obese pregnant women in 2012, in Canada, Kandanto et al. provided their results as follows: value of inactivity (64), light physical activity (81), medium physical activity (53) and intense activity (4).

This research also indicates higher values of inactivity and light activity similar to the previous researches. Of course the value of intense activity was also higher in these people (21). The reason for the low value of intense activity in the present research may be the trainings of the health services providers which prevented the pregnant women from engaging in heavy works. From another hand, the reason for the difference in the values of light activity and inactivity in the present research with the three mentioned researches lies in the

difference in occupation status of women under the research and their culture. Because 16% of women in the present research were occupied outside their homes, while in Nascimento's research (19), more than half (54.6) of the women were employed and also in Chandonnet's research (21), 41% of the women were employed, and because questions related to inactivity included activities such as driving, sitting behind desk, talking on phone, writing, typing, watching TV and studying, perhaps the issue of cultural difference and difference in occupation status can be known as a factor responsible for the difference in the inactivity results.

Totally, it can be concluded from the obtained results of this research and other researches that most pregnant women avoid intense activity and rather engage more in light and medium activity. The average of medium activity allocated the maximum value to itself based on the results. Table.2 is designed to determine the relation between the scores of variables of cognitive-social theory and the level of physical activity and the obtained results are separately discussed for each variable.

There was a positive and significant relation between observational learning with medium physical activity and overall activity. In other words whenever family, friends and counterparts were more active, pregnant women had more tendencies for physical activity. The results were consistent with the researches of Lapanan et al. (2014) (22), and Pugliese and Tinsley (2007) (23), but were contrary to the research of Mesters et al. (2014) (24). According to the present results based on positive effects of observational learning on levels of physical activity of pregnant women and by considering this matter that the maximum level of observational learning is obtained by initial organizing and exercising patterned behaviors symbolically and finally conducting them openly (25); health trainers can have

favorable effect on others by correct strengthening and encouraging positive behaviors of those people who are considered as pattern among pregnant women; so that members of the family can participate by holding family-centered training classes to encourage behavioral modeling. There was a direct and significant relation between social norms with the three levels of physical activity and overall activity. Also, the results of multivariable linear regression test indicated that variable of social norms was related to physical activity in medium and light levels significantly and independently of field variables. The results of the present research supported previous researches (26, 27). Also, there was a significant relation between expectations of consequence and inactivity.

In other words, people who are aware of positive consequences of physical activity have more inactivity. But there was no relation between expectations of consequence and activity levels. The present research supports the results of previous researches (28-30); but the current research was contrary to the results of the research of White et al. (2012) (31), and Ayotte et al. (2010) (32). According to the result of the present research, it seems that expectations of pregnant women in Isfahan city from the results of related to physical activity is not a suitable motivation and stimulant to conduct behavior and therefore has no effect on women compared to observational learning. Pearson correlation coefficient did not indicate any relation between perceived social supports with physical activity. In this regard, the present research was consistent with the research by Goal and Wadsworth (2014) (33), who reported that social support by family and friends had no significant relation with physical activity in American women. Shibata et al. (2009) (34), also observed no significant relation between social support and

physical activity in women. But the results of the present research did not support the results of the research by Andrea and Leiferman (2012) (35), Cleland et al. (2008) (36), and Peyman et al.'s study (2013) (37). Because most of the samples of the present research were housekeepers (82%) who had no personal income (86%) and their spouses were employed outside the house, it is possible that the pregnant women in the current research did not have enough financial support and companionship for sport activity. It should be mentioned here that average of score of perceived social support in pregnant women in the present research was in the medium level which indicates unsuitable social support of pregnant women in order to conduct physical activity. In the author's deduction, according to cultural ground of Iran, the women need support of family and society to conduct many activities such as participate in physical activity plans and using their available sport facilities. Therefore identification of the most important supporting resources of pregnant women is necessary to design behavioral interventions.

Pearson correlation coefficient indicated no significant relation between variable of specifications of physical environment with value of physical activity, the findings supported the results of the study by Shiabata et al. (2009) (34), and Peyman et al. (2013) (37), but the results of the present research were contrary to the study by Walman et al. in 2012 in Germany (38). Based on the available evidences, factors of physical environment such as bad weather (39), low local security and lower accessibility to sport facilities (40) often have been considered as a barrier to conduct physical activity in pregnant women. The findings of the present research indicate unsuitable understanding around physical environment in pregnant women, and the creation of recreational and sport centers broadcasting health

promotion programs in the media should be noted. There was a direct and significant relation between physical activity in medium level and overall activity and variable of observational learning. Also, there was a direct and significant relation between the three levels of physical activity and overall activity with variable of social norms. From another perspective, there was a significant relation between inactivity and expectations of consequence.

4-1. Limitations of the study

One of the problems in conducting this research is the completion of the questionnaire which is time consuming due to the large number of questions, and also the limited number of pregnant women who had the patience to cooperate with the researcher. In this regard, during the completion of the questionnaire, respondents were welcomed to resolve their fatigue. Also, because cultural differences of individuals may affect their physical activity patterns and limit the generalizability of results for women in Isfahan, efforts were made to control this problem through random selection of health centers from health centers 1 and 2.

5- CONCLUSION

The results indicate that pregnant women avoid intense activity levels during this period and work more on levels of light and medium activity. The results showed that there was a significant relationship between the three variables of socio-cognitive theory and several levels of physical activity. From another view point, the results indicated that among variables related to cognitive social theory, social norms as one of environmental factors in person's interaction, which can be used to explain physical activity during pregnancy. Therefore in the future researches, attention to structures that have the most relation with physical activity can be useful in planning training programs.

6- CONFLICT OF INTEREST: None.

7- REFERENCE

1. Solhi M, Ahmadi L, Taghdisi Mohammad H, Haghani H. Effect of model of change stage on conducting suitable physical activity in pregnant women referring to health care centers in Dehaghan city. *Iranian Journal of training in medical sciences* 2011; 11(8): 942-50.
2. Sehati Shafaei F, Shibaei F. life style and its relation with pregnancy results in pregnant women referring to training hospitals in Tabriz, *Iranian journal of obstetrics Gynecology and Infertility* .2014; 17(131): 13-19.
3. WHO. Global recommendation on physical activity for health .2010. Available at: <http://www.who.int/dietphysicalactivity/facts>.
4. Robabi H, Eghbali K, Zareban I, Karimy M, Mirhaghi A, Sanainasab H. An Assessment of Physical Activity Levels among Bank Employees in Iranshahar in 2011. *Journal of Torbat Heydariyeh University of Medical Sciences*. 2013; 1(2):55-62.
5. Mirqafouri Hh, Sayyadi Touranloo H, Mirfakhroddini H. Evaluating and analyzing effective problems on women's participation in sport activities, *sport management*. 2009; 1(1): 83-100.
6. Wojtyła A, Kapka-Skrzypczak L, Biliński P, Paprzycki P. Physical activity among women at reproductive age and during pregnancy (Youth Behavioural Polish Survey - YBPS and Pregnancy-related Assessment Monitoring Survey- PrAMS) - epidemiological population studies in Poland during the period 2010-2011. 2011; 18(2):365-74.
7. Shakeri M, Fekri Sh, Shahnavaaz A, Shakibazadeh E. Evaluating effect of training physical activity in pregnancy period on amount of pregnant women's physical activity, *Journal of Nursing and Midwifery, Tehran University of Medical Sciences*. 2012; 18(3):1-9.
8. Linda de Wit, Judith GM. Jelsma, Mireille NM. van Poppel, Annick Bogaerts, David Simmons, Gernot Desoye, et al . Physical activity, depressed mood and pregnancy worries in European obese pregnant

women: results from the dali study. *Bmc pregnancy and childbirth* 2015; 158: 1-10.

9. Liu J, Blair SN, Teng Y, Ness AR, Lawlor DA, Riddoch C. Physical activity during pregnancy in a prospective cohort of British women: results from the Avon longitudinal study of parents and children. *European Journal of Epidemiology*.2011; 26(3): 237-47.
10. Mousavi E, Koushki M, Alborzi M. Relation of sport activity in period before pregnancy with sport activity of pregnancy period and determining the most important predictor period of sport activity in pregnancy period, *Journal of practical researches of Life Sciences in Sports*.2014; 2(3) : 38-46.
11. Catanzaro R, artal R. Physical activity and exercise in pregnancy, nutrition and health: handbook of nutrition and pregnancy. 2008; 3: 37-53.
12. Hegaard HK, Kjaergaard H, Damm PP, Petersson K, Dykes AK. Experiences of physical activity during pregnancy in Danish nulliparous women with a physically active life before pregnancy. A qualitative study. *BMC Pregnancy Childbirth*. 2010;10:33.
13. Moeini B, Rahimi M, Hazaveie SM, Allahverdi Pour H, Moghim Beigi A, Mohammadfam I. Effect of education based on trans-theoretical model on promoting physical activity and increasing physical work capacity. *J Mil Med*. 2010; 12 (3) :123-30.
14. Bashirian S, Heydarnia A, Allahverdiour H, Hajizadeh E. Usage of the planned behavior theory in predication of effective factors on drug abuse in adolescents, *Journal of Medical Sciences University, Fasa*.2012; (3):156-62.
15. Sargazi M, Mohseni M, Safar-Navade M, Iran-Pour A, Mirzaee M, Jahani Y. Effect of an Educational Intervention Based on the Theory of Planned Behavior on behaviors leading to early diagnosis of Breast Cancer among women referred to health care centers in Zahedan in 2013.
16. Shoaybi F. Imitation and social learning. *Electronic publication*. 2013:7-8.
17. Parsamehr M, Niknezhad M, Hedatollah. Evaluating relation of cognitive social patterns and promoting motivation of conducting physical activity among Human Sciences students of Yazd University, *Journal of Sport Management and movement behavior*. 2015; 11(21): 185-92.
18. Kazemi A, Ahmadi P. Relationship between physical activity during the first 20 weeks of gestation and hypertension in pregnancy. *J Shahrekord Univ Med Sci*. 2007; 9 (2):20-7.
19. Nascimento SL, Surita FG, Cecatti JG. Physical exercise during pregnancy: a systematic review. *Curr Opin Obstet Gynecol*. 2012; 24(6):387-94.
20. R. Cohen T, Hugues P, and Kristine G. Koski. Use of the Pregnancy Physical Activity Questionnaire (PPAQ) to Identify Behaviors Associated With Appropriate Gestational Weight Gain During Pregnancy. *Journal of Physical Activity and Health*, 2013; 10: 1000-7.
21. Chandonnet N, Didier S, Natalie A, Isabelle M. French Pregnancy Physical Activity Questionnaire Compared with an Accelerometer Cut Point to Classify Physical Activity among Pregnant Obese Women., *PLoS ONE*. 2012; 7(6): e38818.
22. Leppänen M, Aittasalo M, Raitanen J, Kinnunen TI, Kujala UM, Luoto R. Physical activity during pregnancy: predictors of change, perceived support and barriers among women at increased risk of gestational diabetes. *Maternal and child health journal* (2014); 18 (9): 2158 – 66.
23. Pugliese J, Tinsley B. Parental socialization of child and adolescent physical activity: a meta-analysis. *J Fam Psychol*. 2007; 21(3):331-43.
24. Ilse Mesters, Stefanie Wahl, Hilde M van Keulen. Socio-demographic, medical and social-cognitive correlates of physical activity behavior among older adults (45-70 years): a cross-sectional study, *BMC public health*. 2007; 14: 647.
25. Glans K, Rimer B, Viswanath K. Health behavior and health education: theory, research, and practice, San Francisco, CA jossey-bass. 2008. ISBN: 978-0-787-99614-7
26. Kylie B, W Jeffery R, Abbott1 G, A McNaughton1 S, Crawford D. Is healthy

behavior contagious: associations of social norms with physical activity and healthy eating, *International Journal of Behavioral Nutrition and Physical Activity*. 2010; 7: 86.

27. Kang S, Youngho K. Relationship of social norms and self-efficacy with physical activity in Korean Adolescents .*Revista de Psicología del Deporte*. 2015; 24(2): 305-10.

28. DeirdreDlugonski, Robert W.Motl. Social cognitive correlates of physical activity among single mothers with young children. *Psychology of Sport and Exercise* 2014;15(6):637-41.

29. Taj Haider, Manoj Sharma and Amy Bernard. Using Social Cognitive Theory to Predict Exercise Behavior among South Asian College Students. *Journal of Community Medicine & Health Education*. 2012;2(6) : 2-6.

30. Young MD, Plotnikoff RC, Collins CE, Callister R, Morgan PJ. Social cognitive theory and physical activity: a systematic review and meta-analysis. *Obes Rev*. 2014; 15(12):983-95.

31. White S M, Thomas R. Wójcicki, McAuley E. Social Cognitive Influences on Physical Activity Behavior in Middle-Aged and Older Adults. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*. 2012; 67(1): 18–26.

32. AyotteBJ, MargrettJA, Hicks-patrick J. Physical activity in middle-aged and young-old adults: the roles of self-efficacy, barriers, outcome expectancies, self-regulatory behaviors and social support. *J Health Psychol*. 2010;15(2):173-85.

33. Gell NM, Wadsworth DD. How do they do it: working women meeting physical activity recommendations. *Am J Health Behav*. 2014; 38(2):208-17.

34. Shibata A, Oka K, Harada K, Nakamura Y, Muraoka I. Psychological, social, and environmental factors to meeting physical activity recommendations among Japanese adults. *Int J Behav Nutr Phys Act*. 2009; 28;6:60.

35. Andrea R S, Leiferman J. Psychosocial mediators to physical activity during the perinatal period: A review of the literature, *Journal of Behavioral Health*. 2012; 1(4):302-14.

36. Cleland VJ, Ball K, Salmon J, Timperio AF, Crawford DA. Personal, social and environmental correlates of resilience to physical inactivity among women from socio-economically disadvantaged backgrounds. *Health Educ Res*. 2010;25(2):268-81.

37. Peyman N, Mahdizadeh M, Taghipour A, Esmaily H. Using of social cognitive theory: predictors of physical activity among women with diabetes type 2. *J Research Health*. 2013; 3 (2): 345-54.

38. Wallmann B1, Bucksch J, Froboese I. The association between physical activity and perceived environment in German adults. *Eur J Public Health*. 2012;22(4):502-8.

39. Kelly R. Evenson, Merry-K Moos, Kathryn Carrier, Anna Maria Siega-Riz. Perceived Barriers to Physical Activity among Pregnant Women. *Matern Child Health J*. 2009; 13(3): 364–75.

40. Goodrich K, Cregger M, Wilcox S, Liu J. A qualitative study of factors affecting pregnancy weight gain in African American women. *Matern Child Health J*. 2013;17(3):432-40.