Medical Journal of the
Islamic Republic of Iran

Volume 17
Number 1
Spring 1382
May 2003

STUDY OF FATIGUE IN WORKING PREGNANT WOMEN

M. POURJAVAD,* M.D., AND A. MANSOORI, M.D.

From the Department of Obstetrics and Gynecology, Mashhad University of Medical Sciences, Mashhad, I.R.Iran.

ABSTRACT

The purpose of the study is to show in which trimester of pregnancy is fatigue more common among working women, and whether or not there is any relationship between fatigue rate and educational level, income, etc.

This is a longitudinal study. From the total number of patients who came to Zeinab University Hospital, 100 completed a demographics 50 item questionnaire and the numerical rating scale fatigue (NRS-F) was obtained.[1] Of those, only 35 patients were in their first trimester of pregnancy and qualified for the study and filled the questionnaire again at 2nd and 3rd trimesters.

The fatigue rate was higher in the first than the two other trimesters of pregnancy (f=126.78, $p<0.001$). In unwanted pregnancies with no moral support by the husband or other family members, the fatigue rate was not significant. There is a relationship between fatigue rate and the education level of these women (f=8.569, $p=0.001$) and income (f=10.72, $p<0.001$). When medical instructions had to be given to a patient to do less work or rest at home, the fatigue rate was significantly higher than those who did not (f=17.34, $p<0.001$).

In conclusion, it appears that health personel working with childbearing populations should counsel women about significant 1st trimester fatigue so they can prepare their work and home environments in an attempt to achieve adequate rest.

MJIRI, Vol. 17, No. 1, 35-39, 2003.

Keywords: Fatigue, Work, Pregnancy, Childbearing.

INTRODUCTION

Fatigue is a common complaint among women throughout pregnancy and during the postpartum period. It is suggested that there are physical, psychological and situational factors predisposing a woman to fatigue during pregnancy. Several studies have attempted to correlate levels of fatigue with other variables. While many of these studies have noted an association between stress and fatigue related to work or home environment and the increased risk of antenatal morbidity, the mechanism of these effects is unclear.

The necessity of this review which is unique in its subject in Iran is stressed. The aim of this study is to show that the fatigue rate in working women during pregnancy is highest in the first trimester and also whether or not there is any relationship between fatigue rate and education level of these women and their income, etc. Also the recognition of fatigue in pregnant women and its consequences by physicians especially those pregnant women who work, results in recognition of ways to help them to overcome the fatigue. Better knowledge of physiologic and affective changes during pregnancy reinforces the supportive environment by the family members and employers of pregnant women.

*Office: +98-511-8548777, Home: +98-511-7689987, Fax: +98-511-8548777, email: mpourjavad@yahoo.com. Women's Hospital of Hazrat Zeinab, Mashhad University of Medical Sciences, Mashhad, Iran.

[Downloaded from mjiri.iums.ac.ir on 2026-11-23]

Encouraging the pregnant woman to have periods of rest and relaxation at work and home results in alleviation of fatigue and its adverse effects such as hypertension in pregnancy, premature labor, and decrease in placental function.

In April 2000, in Michigan, 29 studies evaluated the association of physically demanding work, prolonged standing, long working hours, shift work, and completive work fatigue score with preterm birth, hypertension or pre-eclampsia. The results showed that physically demanding work may significantly increase a woman's risk of adverse pregnancy outcome.[2,3] Another study showed maternal fatigue contributes significantly to antenatal morbidity.[4]

Finally, the recognition of potential adverse effects of fatigue on pregnancy by healthcare professionals, family members and employers, could lead to better and easier working conditions for pregnant women.

MATERIAL AND METHODS

This is a longitudinal study in a common category of women who referred to the special pregnancy clinic for prenatal care. The place for this study was the Women's Hospital of Haszrat Zeinab (A.S.), Mashhad, Iran. The time of study was March 1, 1999, to April 20, 2001. To carry out this study, we first of all used various internet questionnaires in relation to this subject, and we analyzed them in all aspects for the statistical questionnaire—including 50 two- point questions—which were completed by individuals who were eligible for case study. Patients came to the hospital for the first time and were in their first trimester of pregnancy (6-12 weeks). We devised the numerical rating scale for fatigue as NRS-F.[1] Questions written in the questionnaire form were expressed in such a way that the fatigue rate could be evaluated. For example: Is your job type and your salary rate satisfactory and sufficient in accordance with your education level?

Are you, or are you not, emotionally supported by your husband and other members of your family in your home and by your employer at your work base?

Characteristics qualifying patients for the study were as follows:

1. Ages of women were between 19 and 31.
2. Educational level (all were educated—no illiterates).
3. No surgery or medical disorders in recent or former pregnancies. From the total of patients who came to the hospital, 100 completed the questionnaires. Of those, only 35 patients were in their first trimester of pregnancy and qualified for the study.

Statistical method

Because of repeated measurements the statistical method in this study was Multi-Variety Analysis of Variance (MANOVA). Age was a nuisance variable in all evaluations, and other variables were controlled by general linear model (GLM).

RESULTS

Among those educated, working, pregnant women in this study, the mean fatigue in the first trimester was 34.03±8.01, in the 2nd trimester 24.28±7.66, and in the third trimester 17.8±6.7 (Fig. 1, Table. I).

The fatigue rate was higher in the first trimester of pregnancy than in the remaining two trimesters of pregnancy. When the pregnancy was unwanted and there was no moral support by the husband or other family members, the fatigue rate was not significant. When medical instructions had to be given to a patient to do less work or rest at home, these individuals were found to have significantly less education and less family income (f= 17.34, $p<0.001$) (Fig. 2, Table II). Those pregnant women whose work required standing for over three hours per shift had no significant difference in fatigue

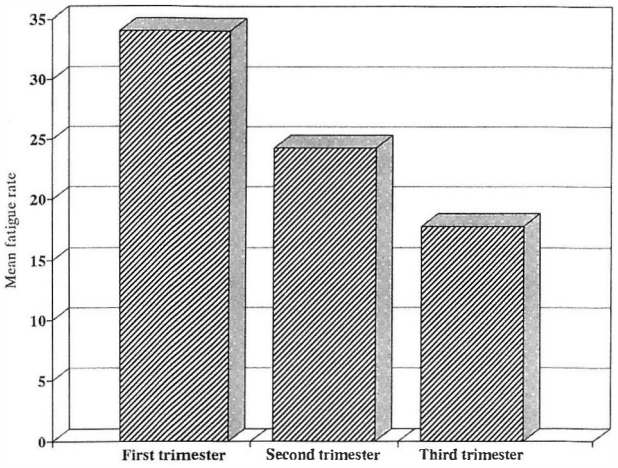

Fig. 1. Mean fatigue rate in working women during three trimesters of pregnancy. (f = 126.78, $p< 0.001$).

Table I. Mean fatigue rate in working women during three trimesters of pregnancy.

SD	Mean	Statistical Criteria/Trimesters
8.01	34.03	First
7.66	24.28	Second
6.7	17.8	Third

With use of MANOVA, the mean fatigue rate was significantly higher in the first trimester than the remaining two trimesters of pregnancy (f= 126.78, $p< 0.001$).

[Downloaded from mjiri.iums.ac.ir on 2026-11-23]

rate in relation to those whose work required less than three hours on their feet (f= 0.81, p= 0.375). The relationship between education level (f= 8.569, p= 0.001, Fig. 3, Table III) and family income (f= 10.72, p< 0.001) (Fig. 4, Table IV) and type of job (f= 10.32, p< 0.001, Table V) was significant.

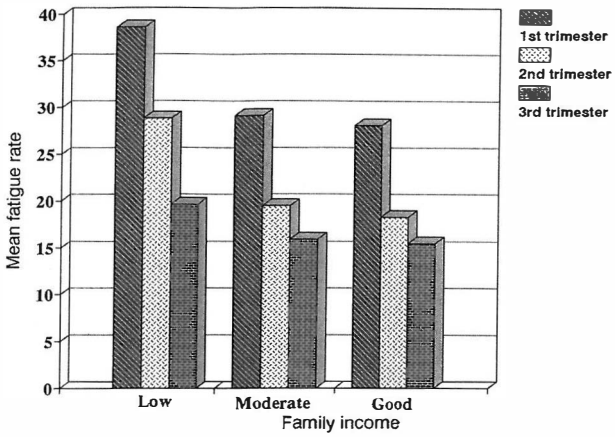

Fig. 2. Comparison between fatigue rate and rest at home in three trimesters of pregnancy. (f= 17.34, p< 0.001).

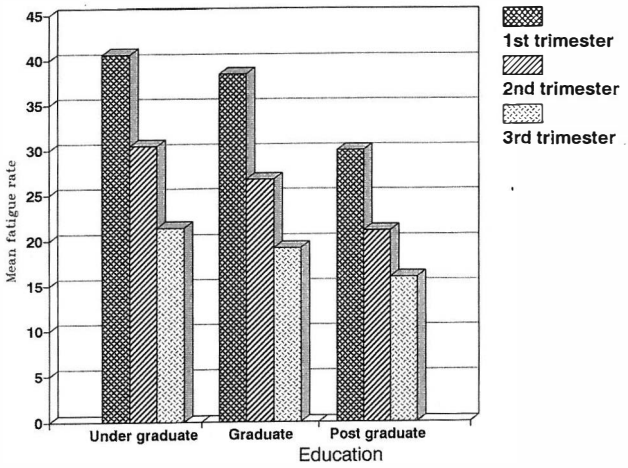

Fig. 3. Comparison between fatigue rate and education level in three trimesters of pregnancy. (f= 8.569, p= 0.001).

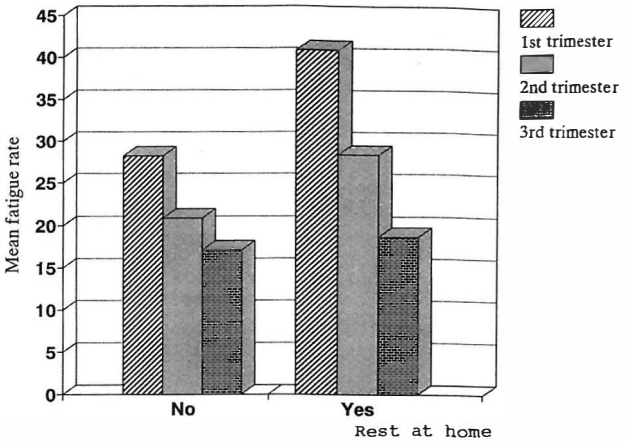

Fig. 4. Comparison between fatigue rate and family income in three trimesters of pregnancy. (f= 10.72, p< 0.001).

DISCUSSION

The definition of fatigue on the basis of the 8th National Meeting for Diagnosis Categorization in Nursing is as follows:

"Severe and constant feeling of loss of strength and degrees of one's ability in performing mental and physical work".[1]

Fatigue is felt by oneself and accompanied by depression and emotions, and has a strong relation to tension and stress. Fatigue among women in pregnancy and after delivery is a common complaint.

To elucidate factors causing widespread fatigue in pregnancy Beadsman and Scotch studied plasma samples from 23 healthy pregnant volunteers. The results suggest that neuroactive steroids may be involved in fatigue during pregnancy. Their site of synthesis and their biological role remain unclear.[5] Fatigue could put women at greater risk of developing postpartum depression.[6] A few studies have directly measured fatigue during childbirth. These studies support the reliability and validity of the measures used to quantify fatigue during labor. These findings support the state of fatigue as a multidimensional concept.[7]

Table II. Comparison between fatigue rate and rest at home in three trimesters of pregnancy.

Third - Trimester Mean ± SD	Second - Trimester Mean ± SD	First - Trimester Mean ± SD	Number	Rest
17.0 ± 4.9	20.8 ± 6.4	28.2 ± 3.9	19	No
18.6 ± 8.4	28.3 ± 7.0	40.8 ± 5.9	16	Yes
17.8 ± 6.7	24.28 ± 7.66	34.03 ± 8.01	35	Total

When medical instructions had to be given to a patient to do less work or rest at home, the fatigue rate was significantly higher than those patients who did not (f=17.34, p<0.001).

[Downloaded from mjiri.iums.ac.ir on 2026-11-23]

Table III. Comparison between fatigue rate and education level in three trimesters of pregnancy.

Third - Trimester Mean ± SD	Second - Trimester Mean ± SD	First - Trimester Mean ± SD	Number	Education
21.4 ± 10.1	30.4 ± 8.6	40.57 ± 8.7	7	Undergraduate
19.25 ± 5.5	26.7 ± 5.3	38.5 ± 7.7	8	Graduate
15.95 ± 5.2	21.1 ± 6.6	29.9 ± 5.1	20	Postgraduate
17.8 ± 6.7	24.28 ± 7.66	34.03 ± 8.01	35	Total

In addition to significant differences between mean fatigue rate in the three trimester of pregnancy, there is a significant difference between fatigue rate and educational level (f= 8.569, p= 0.001).

Table IV. Comparison between fatigue rate and family income in three trimesters of pregnancy.

Third - Trimester Mean ± SD	Second - Trimester Mean ± SD	First - Trimester Mean ± SD	Number	Income
19.5 ± 7.8	28.7 ± 5.9	38.5 ± 7.7	19	Low
15.8 ± 4.5	19.4 ± 4.7	29.1 ± 4.1	9	Moderate
15.4 ± 4.6	18.2 ± 7.3	28.0 ± 3.6	7	Good
17.8 ± 6.7	24.28 ± 7.66	34.03 ± 8.01	35	Total

The relationship between mean fatigue and family income was significant (f= 10.72, p<0.001).

Table V. Comparison between fatigue rate and type of job in three trimesters of pregnancy in working pregnant women.

Third - Trimester Mean ± SD	Second - Trimester Mean ± SD	First-Trimester Mean ± SD	Number	Type of job
21.4 ± 10.1	30.4 ± 8.6	40.57 ± 8.7	7	Employee
16.89 ± 5.28	22.7 ± 5.64	32.35 ± 5.91	28	Clerk

With use of MANOVA, the fatigue rate was significantly higher in workers (employees).

Although both expectant mothers and expectant fathers complain of fatigue during the last trimester of pregnancy, studies have focused exclusively on mothers. In a pilot study that examined parents' levels of morning or evening fatigue, expectant mothers but no expectant fathers reported increasing levels of fatigue, especially morning fatigue, as the pregnancy progressed.[8] Another prospective, longitudinal study was conducted to examine the natural evolution of levels of fatigue among a group of 36 primiparous women during the first 6 weeks postpartum. The results revealed that this group of women experienced higher levels of morning fatigue across the 6 weeks than had previously been reported.[9] In 1999, twenty pregnant and 15 non-pregnant individuals were enrolled. There was no difference in age, parity, BMI, race, marital status, education, income, or hours worked outside the home between pregnant and non-pregnant subjects. Women in the first trimester of pregnancy experience significantly greater fatigue compared to a similar group of non-pregnant women.[10]

Younger age and lower pregnancy levels of iron, ferritin, and hemoglobin explained first trimester fatigue. Less total sleep was related to fatigue in the third trimester. Postpartum fatigue was related to reduced amounts of sleep and low levels of ferritin and hemoglobin.[11] If the ferritin level is below normal, iron- rich foods or iron supplements should be added on a case-case basis during pregnancy.[12] Modifications of the Fatigue Symptoms Checklist can be used clinically to assess fatigue during the childbearing year. Data from a series of studies provide beginning norms that can be used to interpret clinical scores and point to the potential importance of assessments to pregnancy complications and maternal performance. Consistent with the North American Nursing Diagnosis Association (NANDA) definition of fatigue and the theory of unpleasant symptoms, fatigue and performance are important phenomena critical to the experience of pregnancy and assumption of the maternal role.[13] Chronic fatigue syndrome (CFS) is a symptom-complex of unknown pathogenesis without specific markers and the diagnosis is based on clinical criteria.[14] There may be a genetic predisposition for persistent fatigue.[15] Therefore, fatigue is a common, sometimes severe, symptom of early pregnancy. This fatigue

[Downloaded from mjiri.iums.ac.ir on 2026-11-23]

is often out of proportions to what would be expected, and its cause is unclear. It usually resolves by week 20.[16,17,18]

In our study, similar to most studies that have been done throughout the world, the fatigue rate in pregnant working women in the first trimester of pregnancy was higher and specific variables such as educational level, income rate, tranquility at home, emotional relations between husband and wife, occupational position, job satisfaction, etc. contributed to the feeling of fatigue. Numerous studies show a relationship between fatigue and pregnancy disorders such as preterm delivery[19] and delivery of low birth weight infants,[20] increase in blood pressure, etc. Our study continues, and in the future we will study these symptoms as well.

For the physician it is important to take fatigue seriously during pregnancy and to understand how to help these women overcome fatigue. They should be encouraged to establish less stressful periods during each day and instructed in methods of relaxation which can help decrease their fatigue. Better understanding by members of the family and employer about emotional and physiological changes during pregnancy can also result in the pregnant woman's feeling of support at home and at work.

Consequential recognition of the dangers of work for pregnant women could result in allowing them sick-leave or legal vacations on a national level.

REFERENCES

1. Bialobok KM, Monga M: Fatigue and work in pregnancy. Current Opinions in Obstetrics and Gynecology Dec; 12: 497-500, 2000.
2. Mozurkewich EL, Luke B, Avni M, Wolf FM: Working conditions and adverse pregnancy outcome: a meta-analysis. Obstet Gynecol Apr; 95(4): 623-35, 2000.
3. Newman RB, Goldenberg RL, Moawad AH, et al: Occupational fatigue and preterm premature rupture of membranes. Am J Obstet Gynecol Feb; 184(3): 438-46, 2001.
4. Luke B, Avni M, Min L, Misiunas R: Work and pregnancy: the role of fatigue and the "second shift" on anternatal morbidity. Am J Obstet Gynecol Nov; 181(5 pt 1): 1172-9, 1999.
5. Biedermann-K, Schoch P: Do neuroactive steroids cause fatigue in pregnancy? Eur J Obstet Gynecol Reprod Biol Jan; 58(1): 15-8, 1995.
6. Bick D, MacArthur C: Identifying morbidity in postpartum women. Mod Midwife Dec; 4(12): 10-13, 1994.
7. Pou LC: Childbirth and the measurement of fatigue. J Nurs Meas Spring 1(1): 57-66, 1993.
8. Elek SM, Hudson DB, Fleck MO: Expectant parents' experience with fatigue and sleep during pregnancy. Birth Mar; 24(1): 49-54, 1997.
9. Troy NW, Dalgas Pelish P: The natural evolution of postpartum fatigue among a group of primiparous women. Clin Nurs Res May; 6(2): 126-39; discussion 139-41, 1997.
10. Behrenz KM, Monga M: Fatigue in pregnancy: a comparative study. Am J Perinatol 16(4): 185-8, 1999.
11. Lee KA, Zaffke ME: Longitudinal changes infatigue and energy during pregnancy and the postpartum period. J Obstet- Gynecol Neonatal Nurs Mar, Apr; 28(2): 183-91, 1999.
12. Cohen WR: Nutrition, In: Bonnie S. Worthington-Roberts (eds.), Cherry and Merkatz's Complications of Pregnancy. 5th ed., Williams & Wilkins, Chapter 2, pp. 33, 2000.
13. Pugh LC, Milligan R, Parks PL, Lenz ER, Kitzman H: Clinical approaches in the assessment of childbearing fatigue. J Obstet Gynecol Neonatal Nurs Jan-Feb; 28(1): 74-80, 1999 .
14. Jha RR, Masson EA, Lindow SW: A pregnancy associated with severe chronic fatigue syndrome. Journal of Obstetrics and Gynecology Bristol; May; 19(3): 306-307, 1999.
15. Mandell GL, Bennett JE, Dolin R: Chronic fatigue syndrome In: Mandell GL, et al., (eds), Mandell, Douglas and Bennett's Principles and Practice of Infectious Disease. Fifth ed., p. 1530, 2000.
16. Scott JR, Disaia PJ, Hammond CB: Normal pregnancy and prenatal care in: Dickerson VM, Chez RA, (eds.), Danforth's Obstetrics & Gynecology. 8th ed. Philadelphia: Williams & Wilkins, pp. 65-82, 1999.
17. Cunningham FG, Gant NF: Pregnancy Overview, Organization and Diagnosis, In: Cunningham FG, et al. (eds.), Williams Obstetrics. 20th ed., pp. 13-35, 1997.
18. Cunningham FG, MacDonald PC, Gant, NF, Prenatal care, in: Cunningham FG, et al. (eds.), Williams Obstetrics. 20th ed, pp. 227-250, 1997.
19. Hickey CA, Cliver SP, Mulvihill FX, McNeal SF, Hoffman HJ: Employment-related stress and preterm delivery: a contextual examination. Public Health Rep Jul Aug; 110(4): 410-8, 1995.
20. Hernandes Pena P, Kageyama ML, Coria I, Hernandez B, Harlow S: Work conditions, labor fatigue and low birth weight among street vendors. Salud Publica Mex Mar, Apr; 41(2): 101-9, 1999.

[Downloaded from mjiri.iums.ac.ir on 2026-11-23]

[Downloaded from mjiri.iums.ac.ir on 2026-11-23]