

COMPARATIVE STUDY OF BLOOD PRESSURE, BLOOD GLUCOSE AND STRESS LEVELS IN WORKING WOMEN AND HOMEMAKERS

ND Chaitra¹, Veeraiah Shivakumar²

ABSTRACT

Background: Working women today have dual responsibility to be fulfilled at both workplace and home. Homemakers also have a high responsibility to look after home and children. Stress may be common factor in both groups.

Aim: To record blood pressure (B.P.), estimate random blood glucose (R.B.S.) and score the stress levels in working women and homemakers and to compare the said data in the two groups to evaluate risk levels.

Materials and methods: The study was conducted on 80 females, 40 working in banks and 40 homemakers, aged between 20-40 yrs. Subjects were chosen based on inclusion-exclusion criteria and after taking informed consent, B.P., R.B.S., and stress score data were collected. **Statistical Analysis used:** Student t test (two tailed, independent), Leven1s test, Chi-square/ Fisher Exact test Pearson correlation test.

Results and conclusions: On comparing above mentioned parameters, D.B.P. was significantly increased in homemakers ($P = 0.048^*$). 10% homemakers had RBS > 140 mg% while working women had values within normal limits. Homemakers had a higher mean score of Perceived Stress Score (15.95 ± 3.76) than working women (15.70 ± 4.98) though statistically insignificant. It can be concluded that homemakers are at higher health risk than working women. This can be attributed to various factors like rearing more number of children than working women, feeling of worthlessness due to financial dependence and confinement at home in homemakers.

Keywords – blood pressure, stress, BMI, obesity.

INTRODUCTION

Working women today have dual responsibility to be fulfilled at both workplace and home. Homemakers also

have a high responsibility to look after home and children. Stress may be common factor in both groups. Depression can result when stress crosses a threshold level,^[1]. Obesity can result from stress-induced eating,^[2]. This study has been done to compare three health parameters between working women and homemakers by recording blood pressure (B.P), random blood sugar (R.B.S) and scoring of stress levels.

MATERIALS AND METHODS

A comparative study was done among 80 females, aged 20-40 years, of whom 40 were homemakers and 40 were working in banks. Inclusion criteria was – those who gave informed consent, middle socio-economic status. Exclusion criteria was – age > 40 years, pregnancy, premenstrual phase, known case of diabetes / hypertension / mental disorders/ endocrine disorders.

After taking informed consent, a questionnaire was given to each subject to get information regarding their age, address, education, occupation, income, last menstrual period. Taking necessary precautions, blood pressure was measured in sitting position on both arms twice. Under aseptic precautions, random blood sugar level was noted using OneTouch SelectSimple Blood Glucose Monitoring System [LifeScan Europe Division of Cilag GmbH International 6300 Zug Switzerland © 2010 Lifescan, Inc. Rev. date: 09/2010]. Then the Perceived stress score,^[3] questionnaire was given to each subject to be read thoroughly and marked.

STATISTICS^[4,5,6,7]

Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Leven1s test for homogeneity of variance has been performed to assess the homogeneity

¹PG in Department of Physiology, ²Professor & H.O.D., Department of Physiology, Bangalore Medical College and Research Institute (B.M.C.R.I), Karnataka, India.

of variance. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups. Pearson correlation between PSS and study variables is performed to assess the correlation.

Statistical software: The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1, Systat 12.0 and R environment ver.2.11.1 were used.

RESULTS

In table 1, the mean PSS scores are compared between working women and homemakers. Mean PSS scoring was higher for homemakers (15.95±3.76) than working women (15.70±4.98) but not significant. In table 2, the mean stress levels are compared between homemakers and working women. The values are statistically similar with P = 0.591. However, 30% homemakers had average stress levels and 45% had high stress levels as compared to working women of whom 17.5% had average stress and 42.5% had high stress levels. Also percent of homemakers with low to very low stress levels were more than working women. These findings suggest that homemakers are more stressed than working women.

In table 3, BMI distribution in both groups is studied. It shows a mean BMI of 24.10±3.39 in working women and 28.89±8.94 in homemakers. Mean BMI is significantly more in Non-Working women with P = 0.002**. Homemakers appear to be having greater tendency of having higher BMI levels.

In table 4, mean RBS in both groups is compared. The mean RBS in working women is 115.05±16.65 and 115.85±21.10 in homemakers. Mean RBS is statistically similar in two groups with P=0.851, but mean value is higher for non-working women. Though statistically insignificant, 10% homemakers had RBS > 140 mg%.

In table 5, mean SBP of working women is 123.25±12.68 and that of homemakers is 127.75±12.50. Mean DBP of working women is 77.25±7.55 and that of homemakers is 80.45±6.65. The mean DBP is significant in homemakers with P=0.048.

Table 1: Comparison of PSS in two groups of women studied.

Variables	Working	Non working	P value
PSS	15.70±4.98	15.95±3.76	0.801

PSS – Perceived stress Score

Table 2: Comparison of stress level by PSS in two groups of women studied

PSS	Working		Non working	
	No	%	No	%
Very low	2	5.0	1	2.5
Low	8	2.0	4	10.0
Average	7	17.5	12	30.0
High	17	42.5	18	45.0
Very High	6	15.0	5	12.5
Total	40	100.0	40	100.0

Mean stress level is statistically similar in two groups with P = 0.591.

Table 3: BMI distribution of subjects studied

BMI(kg/m ²)	Working		Non working	
	No	%	No	%
<18.5	3	7.5	0	0.0
18.5-25	27	67.5	21	52.5
25-30	8	20.0	9	22.5
>30	2	5.0	10	25.0
Total	40	100.0	40	100.0
Mean ± SD	24.10±3.39		28.89±8.94	

Mean BMI is significantly more in Non-Working with P = 0.002**.

Table 4: Comparison of Levels of RBS in two groups studied

RBS(mg/dl)	Working (n=40)		Non working (n=40)	
	No	%	No	%
<110	15	37.5	18	45.0
110-140	25	62.5	18	45.0
>140	0	0.0	4	10.0
Mean ± SD	115.05±16.65		115.85±21.10	

Mean RBS is statistically similar in two groups with P=0.851.

Table 4: Comparison of Levels of RBS in two groups studied

BP	Working	Non working	P value
SBP (mm Hg)	123.25±12.68	127.75±12.50	0.114
DBP (mm Hg)	77.25±7.55	80.45±6.65	0.048*

Mean DBP is significantly increased in homemakers with $P = 0.048^*$.

DISCUSSION

Homemakers had higher mean perceived stress score (15.95±3.76) than working women (15.70±4.98).

Stress can be defined as neurological and physiological reactions that serves as an adaptive function for the environmental, social, and cultural values and structures within which the individual acts upon,^[8]. Stress can lead to distress with crises in life, since it varies from person to person or event to event,^[9]. Doing household work is considered to be of low status and esteem,^[10]. There is a tendency among full time house wives to be less happy with their lives and in turn more depressed than working women,^[10]. Their confinement in the house is considered the major factor,^[10]. Working women have less children than housewives,^[11]. Having more children among housewives is a cause of depression among housewives because they have the burden of handling more babies alone as compared to working women who have supporting hand for this purpose,^[11]. It has been reported that non-working Pakistani women (full time house wives) are more depressed than working women,^[11].

Working women have the feeling of being a Super Woman, although they have a lot of work pressure both at home and at job place. This has a good impact on mental health of working women,^[12]. Working women develop new skills, have enhanced self-esteem, and increased feelings of competence and self-efficiency,^[10]. The capability of raising children, doing household work, entertaining guests and at the same time, sharing the husband's financial responsibilities appears to be greater in working women,^[10]. There is in turn an enhanced satisfaction and less depression in working women,^[19].

Mean BMI is significantly more in Non-Working women with $P = 0.002^{**}$.

Stress can influence behaviors and health especially when an individual faces challenges that surpass his or

her coping skills,^[14]. Obesity is a well-established risk factor for major causes of morbidity and mortality such as cardiovascular disease, hypertension, stroke, type 2 diabetes and certain forms of cancer,^[15,16,17,18]. Stress may change overall food intake, and lead to, under- or overeating,^[2]. Chronic psychosocial stress has many physiological effects, such as excess cortisol secretion, or can cause obesity through an association with poorer behavioral risk factors, increased caloric intake and sedentary lifestyle,^[19]. Carbohydrate consumption is found to relieve depressive moods,^[20]. A part of the causal link for developing obesity is increased carbohydrate consumption,^[21]. Food consumption is increased in certain individuals and in some, food choices are changed from lower fat to higher fat foods,^[22].

10% of homemakers had RBS > 140 mg% while all working women had RBS within normal limits.

Metabolic syndrome is a cluster of coronary heart disease risk factors, of which increased body weight is a major risk factor,^[23]. Working women are aware of the fact that balanced or good diet is necessary, both for mental as well as physical health because they are more educated than homemakers,^[24].

DBP was significantly increased ($P = 0.048^*$) in homemakers.

Salt retention and insulin resistance is increased by weight gain in obese individuals and can lead to hypertension,^[25, 26]. In persons with higher BMI values, who have greater fat stores, consumption of sodium is more,^[27, 28]. There is less physical activity,^[29] and higher blood pressure than those with normal BMI in all the three stages of hypertension, that is, pre-hypertension, stage I hypertension, and stage II hypertension,^[30].

Limitations of the study are small sample size, short period for the study, lesser accuracy of tests like RBS estimation.

CONCLUSION

Homemakers are at higher health risk than working women. Homemakers are more prone to depression which leads to obesity and in turn higher DBP levels and RBS levels in them. This can be attributed to various

factors like rearing more number of children than working women, feeling of worthlessness due to financial dependence and confinement at home among homemakers.

REFERENCES

1. Soomro RH, Dr. Riaz F, Naved S, Dr. Soomro FH. Comparative analysis of depression among housewives and working women in Bilal colony of Kornagi area Karachi. *Ijcrb* 2012 march; 3(11).
2. Torres SJ, Nowson CA. Relationship between stress, eating behavior, and obesity. *Int J Appl Basic Nutr Sci*. 2007; 23(1112):887-894.
3. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Social Behavior* 1983;24; 385-396.
4. Bernard Rosner (2000), *Fundamentals of Biostatistics*, 5th Edition, Duxbury, page 80-240.
5. Robert H Riffenburg (2005), *Statistics in Medicine*, second edition, Academic press. 85-125.
6. Sunder Rao P S S, Richard J (2006): *An Introduction to Biostatistics, A manual for students in health sciences*, New Delhi: Prentice hall of India. 4th edition, 86-160.
7. Suresh K.P. and Chandrasekhar S (2012). Sample Size estimation and Power analysis for Clinical research studies. *Journal Human Reproduction Science*, 5(1), 7-13.
8. Pearlin LI. The social contexts of stress. In: L Goldberger S Breznitz, eds. *Handbook of Stress*. New York: The Free Press 1982; pp 367-79.
9. Feroza M, Memn MS. Comparison of emotional statuses of Health and Nutrition of Working and Non-working families in Sindh, Pakistan, *Proc. Tenth Natl. Chem. Conf.* 1999 Pp. 111 114.
10. Wattoo FH, Memon MS, Memon AN, Wattoo MHS, Tirmizi SA, Iqbal J. Estimation and correlation of stress and cholesterol levels in college teachers and housewives of Hyderabad-Pakistan. *J Pak Med Assoc* 2008 Jan; 58(1).
11. Feroza ZM. Comparison of Emotional status of health and Nutrition of working and non-working females in Sindh, Pakistan. 49 52, M. Phil. Thesis. [University of Sindh-Jamshoro, Pakistan]: 2001.
12. Khan MA. *Pak J Psychol*, 1994; 25: 23–9.
13. Griffin JM, Fuhrer R, Stansfeld SA, Marmot M. The importance of low control at work and home on depression and anxiety: Do these effects vary by gender and social class? *Soc Sci Med* 2002; 54: 783-98.
14. Kouvonen A, Kivimäki M, Cox SJ, Cox T, Vahtera J. Relationship Between Work Stress and Body Mass Index Among 45,810 Female and Male Employees. *Psychosom Med*. 2005; 67:577-583.
15. Visscher TLS, Seidell JC. The public health impact of obesity. *Ann Rev Public Health*. 2001; 22:355–75.
16. Kannel WB. Effect of weight on cardiovascular disease. *Nutr*. 1997; 13:157–8.
17. Jousilahti P, Tuomilehto J, Vartiainen E, Pekkanen J, Puska P. Body weight, cardiovascular risk factors, and coronary mortality: 15-year follow-up of middle-aged men and women in Eastern Finland. *Circulation*. 1996; 93:1372–9.
18. Ogden J. *Health Psychology. A Textbook*, 3rd ed. Maidenhead: Open University Press; 2004.
19. Wurtman RJ, Wurtman JJ. Carbohydrates and depression. *Sci Am*. 1989; 260:68-75.
20. Arnow B, Kenardy J, Agras WS. Binge eating among the obese: a descriptive study. *J Behav Med*. 1992; 15:155-170.
21. Liu C, Xie B, Chou CP, Koprowski C, Zhou D, Palmer P et al. Perceived stress, depression and food consumption frequency in the college students of China Seven Cities. *Physiol Behav*. 2007; 92:748-754.
22. Oliver G, Wardle J, Gibson L. Stress and Food Choice: A Laboratory Study. *Psychosom Med* 2000; 62:853-865.
23. Faheem M, Qureshi S, Ali J, Hameed, Zahoor, Abbas F et al. Does Bmi affect cholesterol, sugar, and blood pressure in general population? *J ayub med coll abbotabad* 2010; 22(4).
24. Memon FZ, Memon MS, Memon AN, Wattoo MHS, Khand FD. Correlation of stress and blood glucose level in working women and house wives in Sindh, Pakistan. *Pakistan J. Med. Res* 2003; 42(2).
25. Rocchini AP, Key J, Bondie D, Chico R, Moorehead C, Katch V, Martin M. The effect of weight loss on the sensitivity of blood pressure to sodium on obese adolescents. *N Engl J Med*. 1989; 321:580–585.
26. Cooper RS, Van Horn L, Liu K, Trevisan M, Nanas S, Stamler J. A randomized trial on the effect of decreased dietary sodium intake on blood pressure in adolescents. *J Hypertens*. 1984; 2:361–366.
27. Sanchez-Castello CP, Warrender S, Whitehead TP, James WPT. An assessment of the sources of dietary salt in a British population. *Clin Sci*. 1987; 72:95–102.
28. Stamler J. The INTERSALT Study: background, methods, findings, and implications. *Am J Clin Nutr*. 1997; 65(suppl):626S–642S.
29. Nelson L, Jennings GL, Esler MD, Korner PI. Effect of changing levels of physical activity on blood pressure and haemodynamics in essential hypertension. *Lancet*. 1986; 2:473–476.
30. S. Verma, S. Kapoor, and I. P. Singh, "A study of age changes in physical fitness (as measured by rapid fitness index) and its relationship with other body measurements among Lodha tribals of West Bengal," *Indian Anthropologist*, vol. 17, pp. 101–108, 1987.