Original Research Article

Occurrence of Stress Related Nutrition and Health Issues among Women in Few Selected Professions - A Comparative Study

Anees Fathima Thabassum. Z[1], Khyrunnisa Begum[2]

[1]Faculty, Department of Studies in Food Science and Nutrition, University of Mysore, Mysore.
[2]Rtd. Professor, Department of Studies in Food Science and Nutrition, Manasagangotri, University of Mysore, India

Corresponding Author: Anees Fathima Thabassum. Z

ABSTRACT

Employment per se, working conditions and household responsibilities complicate role conflict leading to stress that in turn affect nutrition and health status of women. This study aims to assess health and nutritional status of employed women in relation to stress levels. 400 women (25-40yrs) employed in teaching (32%), healthcare (24%) and clerical (44%) were participants. Assessment for stress, General health quality (GHQ) and menstrual health was obtained using standardized questionnaires; heights and weights were also recorded. Study revealed that Stress (p=0.004), anxiety and depression (p<0.0001) were significantly higher among all women. GHQ scores were poor for women in teaching professionals (8.30±2.68). Pre-menstrual symptoms (PMS) and other health related distresses occurred at higher percentages among healthcare professionals, while those employed in clerical sectors reported Irregular periods, short term heavy bleeding and dysmenorrhea. According to BMI, teachers (54%) were more obese compared to the others. Stress exhibited extremely significant association with GHQ, general health distress, PMS, gynecological issues and menstrual pain. Job-related issues (p=0.042) exhibited a positive correlation with stress. It is obvious that stress is an outcome of conflicts arising due to increased demands and in turn immensely affects women's health both physical and mental health.

Key words: stress, employment, General Health Quality, pre-menstrual symptoms, job-related issues.

INTRODUCTION

Stress is experienced by women who work outside home and also those who don't work outside home. The burden of carrying out monotonous less flexible household chores are stressful, never the less, employed women are highly vulnerable due to the double work load they bear of job and family responsibilities. [1] Both family and employment become equally important in women's life giving way to challenges leading to work-life issues and role conflicts. [2-5] The outcome of the issues and conflicts has an immense influence on women's physical and mental health. [6]

Stressors vary in nature for different occupations, frequency and stages of their occurrence in women's life. They vary according to the individual's psychological maturity; thereby the total effect of stress is displayed through varied patterns of neuroendocrine reactivity. [7] Stress in jobs is related to the type of job, the responsibilities and the duties pertaining to it. Teaching is considered as one of the professions with the highest levels of job stress in recent years. Teachers working at primary and secondary schools report decreased job satisfaction and frequent job stress leading to burnout. [8,9] Both job strain and burnout are related to chronic stress.

Specifically, working under chronic stressful situations (job strain) would affect diverse psychobiological responses (hormonal and cardiovascular) that could lead to altered pathologies, such as cardiovascular diseases, endocrine syndromes or burnout. [8]

Night shift working is obligatory to certain job types. It has been realized that this has a strong influence on workers in general, women in particular. Change in shifts causes health hazards for working women. [6] Hidy Wong, et al 2010 [10] found that shift duties were positively associated with abnormal eating behavior among nurses working in hospitals. Long-term participation in shift work schedules is associated with adverse health problems, [11] such as anxiety depression, insomnia, chronic fatigue as well as different cardiovascular and gastrointestinal disorders. [12-14] Shift work of hospital nurses induces stress, disturbs family life and interferes with their regular meal schedules. [15-19] According to Sackey J, and Aminu Sanda M, 2009, [20] the main sources of stress that are directly connected with woman manager (white collar job) are the task structure or her role and status within the organization. Managerial women, who reported higher pressures, were significantly more likely to experience symptoms of depression, anxiety and somatic complaints. [21]

Job conditions such as heavy workload, role uncertainty and conflict, job insecurity, poor rapport with co-workers and subordinates, repetitive and monotonous tasks, family balance issues, sexual harassment; and in some cases prejudice and discrimination may be the common stressors for women in the workplace. The stress of carrying out two full-time jobs (in the labor force and at home) is known to wear many women out. Yet women, by and large, are unprepared for the degree of conflict that arises between domestic and career responsibilities which lead to increased stress and anxiety. Women may perceive various job conditions as stressful and in some cases, the female outcome is in the form of depression, therefore, these stressors tend to manifest themselves more readily in emotional outcomes such as anxiety, and depression, rather than in the physiological responses most often noted in men. [21] Stress may prematurely age the immune system and could enhance the risk of illness as well as age-related diseases. Studies have revealed that the HPA axis and its end product, cortisol, are thought to be important mediators of the relationship between stressful life experiences and health outcomes. [22,23] Therefore the present study was undertaken to investigate the occurrence of stress related nutrition and health issues among women working in teaching, healthcare and accounts/administrative sectors.

METHODOLOGY

Study population: The study is a population based cross-sectional study carried out in urban region of Mysore a major city from Karnataka in South India. 400 educated married women aged 25-40yrs employed in teaching, health care and accounts/ administration sectors were selected purposefully based on their willingness to participate in the study. Participants were explained about the objectives of investigation and instructions regarding protocols of the study were provided, informed consent was obtained. Written consent was obtained from the participants. Approval from Institutional Ethical Committee, University of Mysore, was obtained. Criteria charted for final selection of subjects included the following: age between 25 to 40 years, educated (graduate), married, with at least one child, employed for >2 years, menstruating and non- pregnant, free mental disorders. Exclusion criteria: Age<25or >40 years, being under any treatment including those with psychiatric problems.

Tools used for data collection: The study combined both qualitative and quantitative data-collection methods. Standardized self-reporting questionnaires were used to obtain

information related to Socio-demographic profile, Employment related details, household activities and responsibilities, Work-Life balance and issues. A detailed account of health related issues were also obtained using DASS by Lovibond and Lovibond [24] (mental health), General Health Questionnaire -28 of David Goldberg, [25] menstrual health and health distress (recurrent minor health issues such as aches and pains), Dietary Behavior, was elicited and Anthropometric assessments were carried out.

RESULTS AND DISCUSSIONS
Socio-demographic profile of participants

Table 1- General Demographic Profile of the Participants

PROFESSION	TEACHING	HEALTH CARE	ACCOUNTS/ADMINISTRATION
NUMBER OF PARTICIPANTS (N VALUE) N=400	129 (32)	97 (24)	174 (44)
AGE (MEAN ± SD)	31.7 ± 3.98	32.3 ± 3.9	31.2 ± 4.3
FAMILY TYPE N (%)			
NUCLEAR	84 (65)	71 (73)	131 (75)
JOINT	43 (33)	26 (27)	41 (24)
EXTENDED	2 (2)	0	2 (1)
SOCIO ECONOMIC STATUS			
MIDDLE	90 (70)	83 (86)	134 (77)
HIGH	39 (30)	14 (14)	40 (23)
PERIOD OF EMPLOYMENT			
< 7 YEARS	87 (67)	62 (64)	132 (76)
> 7 YEARS	42 (33)	35 (36)	42 (24)

The subjective details are presented in Table 1, among the participants 32, 24 and 44% were employed in teaching, healthcare and accounts/administration sectors respectively. The mean age of participants from different employment sectors was essentially similar. Majority of women belonged to (65% to 75%) nuclear families. Seventy to eighty six percent of women were from the mid socioeconomic group. A large percent (64% to 74%) of women from all the three working sectors had less than seven years of period of employment.

Health profile and food behaviour of the participants

Table 2: Health Behaviors, Common Health Complaints Experienced, Food behavior and eating pattern of the Participants No. (%)

VARIABLES	RESPONSES	TEACHING N=129	HEALTHCARE N=97	ACCOUNT/ ADMINISTRATION N=174
Feeling healthy	Yes	121 (94)	87 (90)	171 (98)
Occurrence of health problems	Yes	71 (55)	62 (64)	90 (51)
Common health complaints	Pain related symptoms	27 (38)	21 (34)	28 (31)
	Headaches	21 (30)	10 (16)	15 (17)
	Aches and pains	48 (68)	31 (50)	43 (48)
Health history	Hypertension	9 (7)	1 (1)	6 (3)
	Thyroid disorders	13 (10)	14 (14)	12 (7)
	Anemia	11 (9)	13 (13)	8 (5)
	Diabetes	0	6 (6)	2 (1)
Self-medication	Yes	50 (39)	51 (53)	40 (23)
Analgesics	Yes	93 (72)	67 (69)	120 (69)
Antacids	Yes	19 (15)	11 (11)	11 (6)
Nutritional supplements	Yes	9 (7)	23 (24)	27 (15)
Diet Pattern	Vegetarian	30 (23)	27 (28)	27 (16)
	Mixed	99 (77)	70 (72)	147 (84)
Skipping meals	Yes	80 (62)	65 (67)	96 (55)
	No	49 (38)	32 (33)	78 (45)
Meals Skipped	Breakfast	52 (65)	47 (72)	71 (74)
	Lunch	18 (23)	28 (43)	23 (24)
	Dinner	32 (40)	19 (20)	14 (15)
	Chi value 14.6 p=0.0056,df=4			

A perusal of table 2 reveals the general health related characteristics of the participants. Ninety to ninety eight percent women reported to feel healthy, however 51-64% complained recurrent health problems. The most common health problems experienced by women were aches and pains, it was interesting to note that higher percentage of women working in the teaching profession experienced these symptoms as compared to those in the healthcare (50%) and accounts/ administration sector (48%). Thyroid disorder and anaemia were the most common health issues found among the working women. Self-medication was commonly practiced by the women in the healthcare sectors (53%). Consuming analgesics to relive pain was predominantly seen among women from teaching profession, antacids were also consumed frequently. Twenty four percent women working in the healthcare sector consumed nutritional supplements.

Majority of women participated in the study were non-vegetarians (72% - 84%). Skipping meals was common among the participants; higher percentage of women from and healthcare sector (67%), accounts / administration sectors (62%) skipped meals as compared to teachers (55%). Breakfast was the most common meal skipped (65% - 74%). 43% women in the healthcare sector skipped lunch and 40% women in the teaching profession skipped dinner. Literature suggests that working women had lower meal frequency and poorer meal quality. [19,26] The most common reasons given for skipping meals were household chores/ job work, anger and lack of appetite.
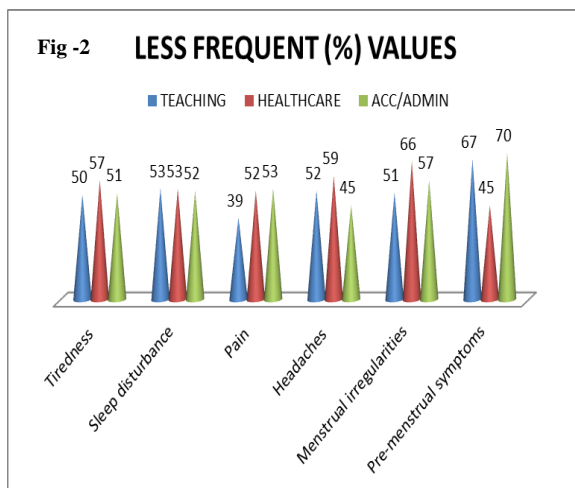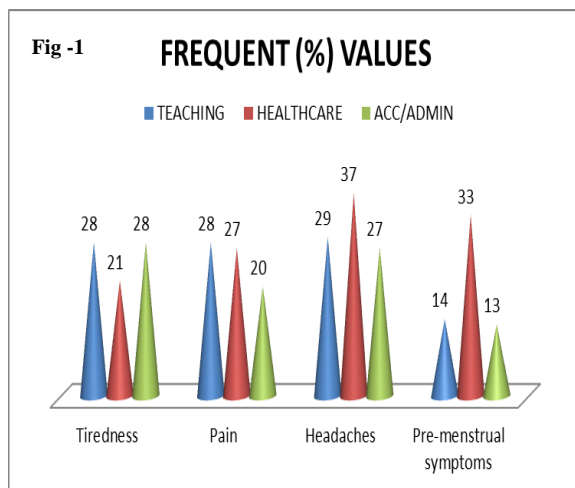

Figure 1 and 2: Frequency of Occurrence of Common Health Related Distress Experienced By the Participants

Figure 1 and 2 represents the common health related distresses experienced by the participants based on the frequency of their occurrence. The complaints have been grouped as those experienced frequently and less frequently. The frequently experienced distresses among women in all the three groups were tiredness, pain (low back pain, shoulder pain etc.,) headaches and pre-menstrual symptoms. It is evident from the figure that tiredness was frequently experienced by women working in teaching and accounts and administration sector (28%). A comparatively higher percentage of women working in the healthcare sectors reported to experience frequent pain (27%), headaches (37%), and pre-menstrual symptoms (33%). Essentially similar percentage of women from all the three groups experienced tiredness, sleep disturbances, headaches and menstrual irregularities less frequently.

Menstrual health of the participants

Table 3: Description of the Menstrual Health status of the Participants No. (%)

Variables	Characteristics	Teaching N=129	Healthcare N=97	Account/ Administration N=170	Chi Value /Significance /Df
Menstrual cycles	Regular	116 (90)	79 (81)	152 (89)	4.55
	Irregular	13 (10)	18 (19)	18 (11)	p=0.102,df=2
Cycle duration	<21 days	25 (19)	27 (28)	15 (9)	
	21 – 27 days	52 (40)	41 (42)	84 (49)	**20.4,**
	28 – 35 days	48 (38)	23 (24)	62 (36)	**p=0.0023,df=6**
	>35 days	4 (3)	6 (6)	9 (5)	
Menstrual problems	Yes	100 (78)	66 (68)	136 (80)	5.05
	No	29 (22)	31 (32)	34 (20)	p=0.080,df=2
Type of problem	Scanty bleeding	4 (4)	2 (3)	3 (2)	
	Heavy bleeding	28 (28)	21 (32)	59 (43)	11.2
	Dysmenorrhea	75 (75)	45 (68)	98 (72)	p=0.084,df=6
	Missing period	24 (24)	10 (15)	14 (10)	
Problems more after joining job	Yes	40 (40)	38 (57)	49 (36)	**8.72**
	No	60 (60)	28 (43)	87 (64)	**p=0.013,df=2**
Work ability	Unaffected	32 (25)	48 (50)	26 (15)	**28.3**
	Moderately affected	92 (71)	47 (48)	140 (82)	**p=<0.0001,df=4**
	Clearly inhibited	5 (4)	2 (2)	4 (3)	
Dysmenorrhea	Mild	12 (9)	23 (24)	17 (10)	**17.8**
	Moderate	55 (43)	22 (23)	62 (36)	**p=0.0013,df=4**
	Severe	62 (48)	52 (53)	90 (53)	
Other gynecological problems	Leucorrhea	42 (33)	34 (35)	54 (32)	
	Foul smelling discharge	6 (5)	9 (9)	5 (3)	6.35 p=0.385,df=6
	Vaginal itching	42 (33)	39 (41)	49 (29)	
	Urinary tract infection	30 (23)	22 (23)	47 (28)	

Menstrual health is a central part of women's lives which influences her sexual and reproductive health. [27] Details about menstrual health of the participants are presented in table 3. It is evident from the table that majority of (81 % to 90%) women had regular periods. Cycle length varied from 21 to 35 days among normal women, the menstrual regulation is under the influence of hypothalamic pituitary ovarian axis, and its dysfunction causes irregular menstruation. However the small differences noted in the cycle length between the groups was statistically mildly significant (p=0.0023). Sixty eight to eighty percent of the women in the study population reported to be experiencing menstrual problems. The frequently encountered problems were dysmenorrhea (68 and 75%) and heavy bleeding (28 and 43%). Heavy bleeding was most common complaint among women from accounts and administration sectors (43%) while those in teaching profession complaint dysmenorrhea (75%). Significantly higher proportion of women were found to experience severe dysmenorrhea (48% to 53%) p=0.0013. Thirty six to fifty seven percent women mentioned that menstrual problems became severe after joining employment (p=0.013). Women from all the groups claimed that their work ability was moderately affected during their periods (48% to 82%) (p<0.0001). A small percentage (2-4%) of the women claimed that their ability to work was clearly inhibited. Leucorrhea, vaginal itching, and urinary tract infections were also reported by women in both the groups. It could be related to the environment in which they work, long hours of sitting, use of public toilets and poor hygiene among women. Studies by Yamamoto et al 2009 [28] revealed a significant correlation between severe menstrual pain, irregular menstrual cycles, and heavy menstrual bleeding on one hand and psychosocial stress on the other resulting in poor health status.Nevertheless, statistical significance was not found.

General Health quality of the participants

Table 4: General Health Quality of the Participants

GHQ	TEACHING N=105	HEALTHCARE N=72	ACCOUNTS/ ADMINISTRATION N=127	F df=2
MEAN SCORES	8.30 ± 2.68	7.55 ± 2.71	7.47 ± 2.55	1.4, p=0.24,
SOMATIC	2.63 ± 0.91	2.22 ± 0.86	2.73 ± 1.01	**6.52 p=0.0017**
ANXIETY AND INSOMNIA	2.43 ± 0.86	2.09 ± 0.82	2.18 ± 0.81	**3.89 p=0.021**
SOCIAL DYSFUNCTION	2.15 ± 0.75	2.04 ± 0.87	1.92 ± 0.83	1.77 p=0.172
DEPRESSION	1.52 ± 0.54	1.72 ± 1.04	1.53 ± 1.08	1.01 p=0.365

We proposed to use GHQ 28 in our population to identify the health status of women working in different employment groups. Our results have indicated that these women are equally at stake of developing stress. It is important to mention here that women are the leading members of the family to take care of all other family members. Therefore she is expected to be physically and socially functional and healthy. Hence the GHQ components such as somatic and social dysfunctions are important in the context of our population. A perusal of table 4 indicates that mean GHQ scores were 8.30 ± 2.68, 7.55 ± 2.71, 7.47 ± 2.5 for women employed in teaching, healthcare and accounts and administration sectors respectively. Women employed in teaching profession had higher mean scores, may have a higher risk for health distress. A significant difference was noted in the mean scores for somatic and anxiety and insomnia whereas social dysfunction and depression were essentially similar for the 3 groups.

Depression, Anxiety and stress Scores

Table 5: Depression, Anxiety and Stress Scores of the Participants

DAS SCORES				Chi value
LEVELS	TEACHING N=108	HEALTHCARE N=71	ACCOUNTS/ ADMINISTRATION N=130	
STRESS				
NORMAL	37 (34)	11 (15)	30 (23)	
MILD	34 (32)	21 (30)	42 (32)	**21.58 p=0.0014,df=6**
MODERATE	30 (28)	39 (55)	46 (36)	
SEVERE	7 (6)	0	12 (9)	
ANXIETY				
NORMAL	48 (44)	16 (23)	72 (55)	
MILD	19 (18)	28 (39)	44 (34)	**43.46 p=<0.0001,df=6**
MODERATE	35 (32)	21 (30)	14 (11)	
SEVERE	6 (6)	6 (8)	0	
DEPRESSION				
NORMAL	31 (29)	13 (18)	47 (36)	
MILD	35 (32)	15 (21)	48 (37)	**32.4 p=<0.0001,df=6**
MODERATE	31 (29)	31 (44)	35 (27)	
SEVERE	11 (10)	12 (17)	0	

The DASS tool helps to assess stress, anxiety, and depression therefore is a recommended tool to be applied for normal individuals. Table 5, suggests presence of stress among the participants. Mild (30% to 32%) and moderate (28% to 55%) forms of stress occurred in relatively higher proportion of women, it was interesting to see that higher percentage of women employed in the health care sectors had stress (55%), statistically significant difference was noted (p=0.0014). Anxiety and depression are the mental states expressing the highest form of stress. unfulfilled desires, incompetency, restrictions, incomplete and unfinished tasks, activities and responsibilities, lack of recognition and respect are a few of the major reasons that repeat in day to day life causing anxiety and depression among

women. It is obvious from the table that 30-40% women experienced anxiety and depression. Small percentages (10-17%) of women were found to have severe depression. Moderate levels of anxiety and depression were experienced by a higher percentage of women from the healthcare sector. The differences were statistically significant.

Body mass Index classification of the participants

Table 6: Body mass Index classification of the participants (Mean ± SD)

INDICES	TEAGHING N=121	HEALTHCARE N=94	ACCOUNTS/ ADMINISTRATION N=161	F VALUE Df=2
BMI	24.8 ± 4.2	25.2 ± 5.7	23.5 ± 3.9	**5.46 p=0.004**
BMI : Underweight (<18.5 kg/m^2)	6 (5)	5 (5)	6 (4)	**Chi value**
Normal or lean BMI (18.5–22.9 kg/m^2)	23 (19)	31 (33)	51 (32)	**16.13**
Overweight (23.0 –24.9 kg/m^2)	27 (22)	14 (15)	44 (27)	**p=0.014**
Obese (≥25 kg/m^2)	65 (54)	44 (47)	60 (37)	**df=6**

Table 6 provides information about the BMI of the subjects. Asia pacific BMI classification was employed, accordingly, 19 to 33% of the women participants were within the normal ranges. A small percentage (5% to 11%) had BMI less than 18.5 kg/m^2 indicating chronic energy deficiency. Obesity was prevalent in higher percentage (37% to 54%) among the participants, it is interesting to infer from the table that comparatively higher percentage of women working in accounts/ administration sectors were overweight, whereas a higher percentage of women employed in teaching profession were obese (54%) . Around 33% of the women working in the healthcare sectors had normal BMI, the differences were statistically significant. An overall impression of anthropometric profile suggests a marked difference in weight and BMI between the three groups. Shauna Downs [29] recently reported that rates of overweight and obesity are on the rise, particularly among women. Ersoy C and Imamoglu S [30] found overweight to be more prevalent in employed and obesity among unemployed women (housewives).

It is evident from the results presented in this paper, that employed women are at a high risk for health problems and poor well-being due to the complex interplay of the role conflicts (family and work) leading to stress. It is evident that employment per se causes stress while type of employment contributes to an additive effect on the health and nutritional status of women. Thus we considered appropriate to correlate stress with the general health variables and nutritional status to understand their associations. Table 7 reveals that stress has a significant influence on the general, menstrual and mental health of employed women.

Table 7: Correlating Stress with Health Related Variables

Variables	Correlates	Employed women N=400	
		r value	p value
	GHQ	0.469	**<0.0001**
	General health distress	0.40	**<0.0001**
	Premenstrual symptoms	0.27	**<0.0001**
	Gynecological issues	0.22	**<0.0001**
STRESS	Menstrual cycles	0.112	**0.025**
	Occurrence of Dysmenorrhea	0.264	**<0.0001**
	Menstrual Pain intensity	0.243	**<0.0001**
	Body mass index	0.061	0.219

CONCLUSION

Our study revealed that employment per se triggers a preponderant effect on women health and nutritional status inducing stress. The effects get compounded by other factors such as women's workload and type of employment. Major health issues among young adult women were general aches and pains, menstrual problems, poor eating behavior and excess. In the present day scenario where life is moving at a rapid pace, with high demands, competition, and challenges, it is likely that many end up with lack of rest, recovery and restitution which is a primary factor for greater health problems than the absolute level of stress. [31] Long term stress upsets

the homeostasis which can cause a variety of health problems such as mental disorders and enhances the risk of illness as well as age-related diseases.

Conflict Of Interest: None

REFERENCES
1. Waldron I, Weiss CC and Hughes ME. Interacting effects of multiple roles on women's health. Journal of health and social behavior. 1998 Sep 1:216-36.
2. Jacobson JL. Woman's health: the price of poverty.1993:3-31.
3. Ahmad-Nia S. Women's work and health in Iran: a comparison of working and non-working mothers. Social science & medicine. 2002 Mar 31;54(5):753-65.
4. Gupta A, Koshal M and Koshal RK. Women managers in India: Challenges and opportunities. Management in India. 2006 Jan 4:285-312.
5. Netemeyer RG, Boles JS and McMurrian R. Development and validation of work–family conflict and family–work conflict scales. Journal of applied psychology. 1996 Aug;81(4):400-10
6. Usha B and Geetha KT. Stress and Cope-up Strategies A Case Study of Odd Hour Women Employees. Social Change. 2010 Dec 1;40(4):545-62.
7. Evolahti A, Hultcrantz M and Collins A. Women's work stress and cortisol levels: a longitudinal study of the association between the psychosocial work environment and serum cortisol. Journal of psychosomatic research. 2006 Nov 30;61(5):645-52.
8. Moya-Albiol L, Serrano MA and Salvador A. Burnout as an important factor in the psychophysiological responses to a work day in teachers. Stress and Health.2010; 26:382–393.
9. Stoeber J and Rennert D. Perfectionism in school teachers: Relations with stress appraisals, coping styles, and burnout. Anxiety Stress and Coping. 2008; 21:37–53.
10. Wong H, Wong MC, Wong SY and Lee A. The association between shift duty and abnormal eating behavior among nurses working in a major hospital: a cross-sectional study. International journal of nursing studies. 2010 Aug 31;47(8):1021-7.
11. Atkinson G, Fullick S, Grindey C and Maclaren D. Exercise, energy balance and the shift worker. Sports Medicine. 2008 Aug 1;38(8):671-85.
12. Ardekani ZZ, Kakooei H, Ayattollahi SM, Choobineh A and Seraji GN. Prevalence of mental disorders among shift work hospital nurses in Shiraz, Iran. Pakistan journal of biological sciences: PJBS. 2008 Jun;11(12):1605-9.
13. Ursin R, Baste V and Moen BE. Sleep duration and sleep-related problems in different occupations in the Hordaland Health Study. Scandinavian journal of work, environment & health. 2009 May 1:193-202.
14. Celik S, Veren F and Ocakci A. Gastrointestinal complaints related to eating and drinking habits and work life of intensive care nurses in Zonguldak, Turkey. Dimensions of Critical Care Nursing. 2008 Jul 1;27(4):173-9.
15. Callaghan P, Tak-Ying SA and Wyatt PA. Factors related to stress and coping among Chinese nurses in Hong Kong. Journal of advanced nursing. 2000 Jun 1;31(6):1518-27.
16. Gates DM. Stress and coping: A model for the workplace. AAOHN Journal. 2001 Aug;49(8):390-8.
17. Geliebter A, Gluck ME, Tanowitz M, Aronoff NJ and Zammit GK. Work-shift period and weight change. Nutrition. 2000 Jan 31;16(1):27-9.
18. Lancaster J, Pickles D and Dobson K. Barriers to healthy eating in the nursing profession: part 1. Nursing Standard. 2001;15 (36), 33–36.
19. Persson M and Mårtensson J. Situations influencing habits in diet and exercise among nurses working night shift. Journal of nursing management. 2006 Jul 1;14(5):414-23.
20. Sackey J and Sanda MA. Influence of occupational stress on the mental health of Ghanaian professional women.

International Journal of Industrial Ergonomics. 2009 Sep 30;39(5):876-87.

21. Snow DL, Swan SC, Raghavan C, Connell CM and Klein I. The relationship of work stressors, coping and social support to psychological symptoms among female secretarial employees. Work & Stress. 2003 Jul 1;17(3):241-63.

22. Stanton JM, Balzer WK, Smith PC, Parra LF and Ironson G. A general measure of work stress: The stress in general scale. Educational and Psychological Measurement. 2001 Oct;61(5):866-88.

23. Dhabhar FS and Mcewen BS. Acute stress enhances while chronic stress suppresses cell-mediated immunityin vivo: A potential role for leukocyte trafficking. Brain, behavior, and immunity. 1997 Dec 31;11(4):286-306.

24. Lovibond PF and Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behaviour research and therapy. 1995 Mar 31;33(3):335-43.

25. Goldberg D. Manual of the general health questionnaire. NFER Nelson; 1978.

26. de Assis MA, Kupek E, Nahas MV and Bellisle F. Food intake and circadian rhythms in shift workers with a high workload. Appetite. 2003 Feb 28; 40(2):175-83.

27. Brantelid IE, Nilvér H and Alehagen S. Menstruation during a lifespan: a qualitative study of women's experiences. Health care for women international. 2014 Jun 3;35(6):600-16.

28. Yamamoto K, Okazaki A, Sakamoto Y and Funatsu M. The relationship between premenstrual symptoms, menstrual pain, irregular menstrual cycles, and psychosocial stress among Japanese college students. Journal of Physiological Anthropology. 2009 May 31;28(3):129-36.

29. Downs S. The Multiple Burdens of Malnutrition. 16 Sight and Life.:41.

30. Ersoy C and Imamoglu S. Comparison of the obesity risk and related factors in employed and unemployed (housewife) premenopausal urban women. Diabetes research and clinical practice. 2006 May 31;72(2):190-6.

31. Lundberg U. Stress hormones in health and illness: the roles of work and gender. Psychoneuroendocrinology. 2005 Nov 30;30(10):1017-21.

****