



RESEARCH ARTICLE

IMPACT OF SHIFT WORK SCHEDULES ON LEVELS OF STRESS, ANXIETY AND WORK LIFE BALANCE IN BPO EMPLOYEES

***Dr. Puneeta Ajmera, Dr. Harish K. Satia and Dr. Mahavir Singh**

¹Assistant Professor-II, Amity Medical School, Amity University Haryana, India

²HOD, Department of Hospital Administration, Amity University Haryana, India

³Dean, Faculty of Health and Allied Sciences, Amity University Haryana, India

ARTICLE INFO

Article History:

Received 27th December, 2015

Received in revised form

04th January, 2016

Accepted 27th February, 2016

Published online 31st March, 2016

Keywords:

Anxiety, Stress, Work life balance,
Shift work, State-trait anxiety scores,
Work life conflict.

ABSTRACT

BPO industry demands frequent shift changes and odd working hours. BPO employees are prone to work related stress as they have to work in odd hours and frequent shift changes in this profession lead to increased physical and mental health problems. This study has evaluated anxiety, stress and work life balance of BPO employees working in different shifts. Sample comprised of 250 employees with an average age of 34.65 years and standard deviation 6.74 years divided into general shift (n=57), second shift (n=53), night shift (n=62) and rotating shift (n=78). Results showed that rotating shift employees had higher State-Trait anxiety scores and stress levels than other employees. F value for Work life balance was 15.67 in rotating shift employees. There were variations in the level of work-life balance among the employees based upon the shifts they were working in. F value for work life conflict was 6.84 again showing variations in work life conflict of the employees.

INTRODUCTION

A big boom in the BPO industry has been observed in recent years which have generated a lot of employment opportunities for young professionals. This industry demands frequent shift changes and odd working hours. BPO employees are prone to work related stress as they have to work in odd hours and frequent shift changes in this profession lead to increased physical and mental health problems (Berrios,1990, Chitra and Sheela, 2012). Working in shifts causes fatigue which has been reported to be related to various disorders and health problems like stress, insomnia, depression, anxiety etc. (Gandevia, 1992; Hawley and Reilly, 1997, Berrios, 1990; Chitra and Sheela, 2012; Presser, 2003). Fatigue is defined as a state of perception which explains a range of affliction, usually related to mental and physical weakness and associated with a general state of lethargy to a specific work generated burning sensation within the muscles. It is the inability of body to continue functioning at the level of one's normal abilities (Hawley and Reilly, 1997, Berrios, 1990; Chitra and Sheela, 2012).

Shift Work

Shift work is defined as working in non standard hours i.e outside typical day schedule of 8 am. to 5 pm from Monday to Friday. (Pressor 2003). It includes evening shift (3 pm to 11pm or 4 pm to 12 pm), night shift (11pm to 7 am or 12 midnight to 8 am) and rotating shifts (alternate evening, night and day shifts).

*Corresponding author: Dr. Puneeta Ajmera

Assistant Professor-II, Amity Medical School, Amity University Haryana, India.

There is difference between shift work and flexible schedules which involves variations in timings of arrival and departure at the work place. Further shift work schedule may be categorized as fixed schedule or rotating schedule. In fixed schedule, employees work in a fixed particular shift like day shift or evening shift continuously while in alternate shifts, employees work in all the shifts alternatively. Shift work has now become common especially in manufacturing industries, IT, business process outsourcing industries etc. Previous researches show that shift work not only affects physical health of employees but it has an effect on psychological health and family health also. Shift work is known to be associated with physical health problems like musculoskeletal problems, cardiac problems, digestion problems. There are increased reports of headaches, irritability, anxiety and depression (Rose, Ware, Kolm, Risser, 2000). In severe cases domestic and social relationships are also disrupted and most of the times they often miss out on social events and family gatherings, when they need to work or sleep instead. These job requirements can lead to feelings of isolation, frustration and depression as precious personal and family time is lost. In a study conducted on retired shift workers, the incidence of depression was found to be more frequent in shift workers when compared with workers working in general day shift (Michael-Briand, Choppard, Guilot, 1981). Furthermore one study suggests that working in night shift may cause clinical depression (Allene and Scott, 2000). These health issues are considered an international problem amongst BPO employees. BPO employees work in shifts and it has been studied that shift workers sleep 1-4 hours less than day-workers which has an effect on stage 2 (a transitional phase where an individual gradually becomes less conscious of his external

surroundings) and REM sleep (Akerstedt, T. 1990). Thereby suggesting the possibility that the majority of BPO employees could be facing continuous accumulation of sleep debt. Sleep researcher Drew Dawson reported that approximately 20–25 hours of wakefulness produced performance decrements which are almost equivalent to those observed at a blood alcohol concentration (BAC) of 0.10, with 17 hours of sustained wakefulness observed at an equivalent of 0.05 BAC (Dawson, 1997). These are a few of the effects of shift work amongst working professionals. It is reported by Harrington that 20-30% of workers leave shift work within 2 to 3 years because of health related problems (Harrington, 1978). A study concluded that BPO employees who have worked in rotating shifts revealed more sleep/wake cycle disruption and nodded off more at work as compared to those who worked in day/evening shifts (Greenhaus, Parasuraman S; Collins, K.M. 2001). One study reported that 17-18 hours of wakefulness was likely to exhibit a significantly slower reaction time and greater likelihood to miss information and fatigue reaches a level that compromises safe performance (Work Australia, 2009). Long hours, shift work, high workload and increased sleep debt combined with fatigue can lead to dire outcomes. In 2005-06 shift workers contributed 16 % of the working population, though they incurred 27% of all work-related injuries (Ohayon, *et al.*, 2002)

Williams, Magid and Steptoe (2005) in a study concluded that cortisol levels are found to be high in the employees working under a scheme of alternating 8-hrs daytime shifts starting at 5PM on waking and is associated with chronic stress and poor sleep quality. However, workers under the same scheme starting at 8hrs in the morning had normal cortisol levels.

Aim of the Study

To find out the impact of shift work schedules on levels of stress, anxiety and work life balance in BPO employees.

MATERIALS AND METHODS

2.1 Sample: A survey was conducted among 250 BPO employees in Gurgaon including 150 males and 100 females in the age group between 21 to 45 years. Convenient sampling technique was used for choosing the participants for the study (Mean Age 34.65, S.D 6.74)

The respondents were divided according to their work schedule with different environmental characteristics as follows:

- 1) *General shift (n=57)*: these BPO employees worked only during the daytime and kept the same work schedule (from 8am to 5pm)
- 2) *Second shift (n=53)*: these employees worked from 4 pm to 12 pm in the second shift.
- 3) *Night Shift (n=62)*: these BPO employees worked only in night shift from midnight 12 to 8 am.
- 4) *Rotating shift (n=78)*: employees worked in alternating evening, night and general shifts

Measuring tools

Lipp's Stress Symptom Inventory (LSSI), to assess if the individual have the symptoms of stress, if the symptom is

somatic or psychosomatic and the stress phase in which the individuals feel they lie in. (In alert phase the individual prepares for fight or flight; in resistance phase - constant stress to which the individual tries to adapt, exhaustion phase - the stressor is constant and the quasi - exhaustion and individuals have no strategies to deal with it; the organism exhausts its adaptive energy reserve and more serious diseases appear) (Lipp, 2000). This questionnaire consists of three parts assessing physical and psychological symptoms observed in the previous 24 hours (15 items), which define the Alert phase, during the previous week (15 items), which identifies the Resistance and Near-exhaustion phases, and during the previous month (23 items), which identifies the period of Exhaustion of the stress. Symptoms identified were marked by the patient in the questionnaire, and each identified item received one point.

State-Trait Anxiety Inventory (STAI), containing 20 statements was used to measure anxiety traits. This tool is used to identify individuals who have a tendency to react to psychological pressure of different intensities so that anxiety can be measured to determine the levels of the anxiety state. (Spielberg, Gorsuch and Lushene, 2008). Work life balance scale: This is a four item scale developed by Brough, Timms and Bauld in 2009 to measure work life balance. Subjects were asked to mark the extent to which they agree with the statements regarding work life balance using Likert scale. Work life conflict: This is a form of inter role conflict where there is interference of role in one domain with role in other domain. (Greenhaus and Beutell, 2001) Netemeyer, Boles and Mc Murray developed a ten item scale based on Likert scale to measure work life conflict. Subjects were asked to mark their level of agreement to the ten points. Mean state-trait anxiety scores, Lipp's Stress Symptom Inventory scores and ANOVA were used as data analysis tools.

Demographic profile of participants

26.5% respondents were between 21 and 25 years of age, 24.6% respondents were between 26 to 30 years of age, 19.2% between 31 and 35 years of age, 18.3% between 36 and 40 years of age and 11.4% between 41 and 45 years of age.

RESULTS

The mean state anxiety of total 250 employees was 37.3 with SD 9.47 and mean trait anxiety score was 37.8 with SD 8.32. 15.9% employees exhibited stress. Mean state anxiety scores for general shift employees were 31.25 with SD of 5.65 and mean trait anxiety scores were 32.13 with SD 6.35 and stress percentage was 11.23% in general shift employees. Mean state anxiety scores for employees working in second shift were 37.67 with SD 7.68 and mean trait anxiety scores were 37.83 with SD 8.24 and stress percentage was 17.89 in this group. For employees working in night shift mean state anxiety scores were 36.4 and SD 8.20 and mean trait anxiety scores were 35.67 with SD 5.87 with stress percentage of 19.78. Mean state anxiety scores for employees working in rotating shift were found to be highest with mean 40.23 and SD 9.04 and trait anxiety scores were 40.12 with stress percentage of 23.7 showing that these employees were more anxious.

Table 1. Mean state trait anxiety scores of BPO employees working under different work schedules

Variables	Total sample (n=250)		General shift (n=57)		Second shift (n=53)		Night shift (n=62)		Rotating shift (n=78)	
	M	SD	M	SD	M	SD	M	SD	M	SD
State anxiety	37.3	9.47	31.25	5.65	37.67	7.68	36.54	8.20	40.23	9.04
Trait anxiety	37.8	8.32	32.13	6.35	37.83	8.24	35.67	5.87	40.12	7.45

Table 2. Lipp's Stress Symptom Inventory scores

Stress %	15.9	11.23	17.89	19.78	23.7
Stress symptoms	87.54% psychological & 12.49% physical	9.32% psychological & 5.6% physical	11.53% psychological & 6.3% physical	18.75% psychological & 11.54% physical	26.71% psychological & 13.2% physical

Table 3. Scores of ANOVA

Variable	Shifts	Mean	SD	F value	Sig
Work life balance	General	12.34	3.45	15.67	.000
	Second	14.64	3.78		
	Night	15.01	2.53		
	Rotating	15.89	.03		
Work life conflict	General	14.13	4.98	6.84	.000
	Second	15.82	5.32		
	Night	16.67	6.02		
	Rotating	17.78	6.64		

Analysis of Variance (ANOVA) was conducted to find out if there exists a significant difference in work life balance of BPO employees working in different shifts. Results show that variables related to work life balance of BPO employees working in different shifts differ (F value= 15.67). There were variations in the level of work-life balance among the employees based upon the shifts they were working in. F value for work life conflict was 6.84 again showing variations in work life conflict of the employees.

DISCUSSION

The results of the study showed that employees working in rotating shifts had high state anxiety scores as well as trait anxiety scores than general shift and night shift employees. Also, stress levels between three groups were different indicating high stress percentage among rotating shift employees. This may be due to irregularity in sleep-wake cycle, disturbed and desynchronized circadian rhythms and psychosocial problems arising out of shift work. (Akerstedt, Torsvall and Gillberg, 1982; Arnaud-Briant and Dreyfus, 2002). Sleep is a basic human need which is related to both homeostatic mechanisms of the body and circadian rhythms (Zeman and Reading, 2005). The homeostatic mechanism of the body is controlled by time spent awake. As time without sleep passes, an individual develops sleep drive because of the accumulation of somnogens which in turn creates a pressure to sleep which increases in a linear fashion the longer a person is awake.

Naps are known to decrease sleep drive and therefore prolong the time a person can comfortably remain wakeful. The circadian rhythm is the internal clock that regulates body functions from the hypothalamus. It governs the usual pattern of waking for the daytime and sleeping at night. It can be reset by deliberate actions. The homeostatic mechanism cause greater sleep propensity because of reduced sleep phase and prolonged wakefulness. (Akerstedt and Gillberg, 1981; Czeisler, Weitzman, Moore-Ede, Zimmerman and Kronaur, 1980 Lavie, 1996) The circadian mechanism distributes maximum and minimum moments of sleep propensity over 24 hours which may coincide with physiological rhythms of the body like body temperature where minimum sleep propensity values coincide with maximum temperature and vice versa. During night shifts, sleep initiates at wrong circadian time thereby causing internal and external desynchronization. Alterations caused by rotating shifts demand work hours that are different from general shift employees thereby causing conflicts and high levels of anxiety and stress.

Katie Moraes de Almondes and John Fontenele Araujo in 2009 conducted a study to find the impact of shift work schedules on levels of stress and anxiety in a petrochemical company using LSSI and STAI Inventory. Results of the study showed that shift work schedules caused more situational and dispositional anxiety. High anxiety levels were present in shift worker groups but in reference to stress, there was not much significant difference between fixed daytime schedules and different schedules. Our study also proved that BPO employees working in rotating shifts were more anxious. All the employees who exhibited stress were in resistance phase in which individuals automatically try to deal with their stressors in order to maintain their internal homeostasis mechanism (Lipp, 2000). But employees working in rotating shifts exhibited more stress percentage as their work hours kept on changing after a certain duration disturbing circadian rhythm everytime. This research also indicated that work life balance of employees working in general shift and second shift was better than those of the employees working in night shift and rotating shift. The results of this research supports the findings of another study done by

Golla and Vernon in 2006 which proved that workers take non standard work schedules like night shift as a balancing technique so that they can take child care responsibility. Other variables that support our results like lifestyle irregularity which is expected in employees working in rotating shifts due to disturbance in homeostatic mechanism of the body and circadian rhythms which cause stress and anxiety.

Conclusion

Results of the study showed that both state and trait anxiety levels and stress levels were highest in employees working in rotating shifts. Employees working in night shift also exhibited higher stress and anxiety levels than employees working in second and general shifts but less than in rotating shifts suggesting that these high anxiety and stress levels are due to antibiological work schedules. Some levels of stress and anxiety were found in employees working in general shift also which may be due to greater work pressure. Further, individual interpretation and perception play an important role in association between shift work and circadian and homeostatic mechanism of the body alterations which causes higher stress and anxiety levels. So a behavioral and cognitive intervention through learning strategies may help the employees to change their perception towards the threats posed by these alterations and this may ease the consequences of shift work schedules.

REFERENCES

- Akersdedt, T., Kecklund, G. and Knutsson, A. 1991. Spectral analysis of sleep electroencephalography in rotating three-shift work. *Scandinavian Journal Work Environment and Health*, 17 (5), pp 330-336.
- Akerstedt, T. 1990. Psychological and psycho physiological effects of shift work. *Scand J Work Environ Health*, 16(Suppl1), pp 67-73.
- Akerstedt, T., Torsvall, L. and Gillberg, M. 1982. Sleepiness and shift work: field studies. *Sleep*, 5 (Suppl 2),
- Allene, J. and Scott, M. 2000. Shift work and Health. Primary Care: Clinics in Office Practice. 27(4)
- Berrios, G.E. 1990. Feelings of fatigue and psychopathology: a conceptual history. *Compr Psychiatry*, 31 (2): 140-51. doi:10.1016/0010-440X(90)90018-N. PMID 2178863.
- Chitra Devi, A. and Sheela Rani, S. 2012. Impact of shift work on work life balance – A study among women employed in BPO. *National Journal on Advances in Computing and Management*, 3 (1).
- Czeisler, C. A., Weitzman, E. D., Moore-Ede, M. C., Zimmerman, J. C. and Kronauer, R. S. 1980. Human sleep: its duration and organization depends on its circadian phase. *Science*, 210 (4475), pp 1264-1267.
- Dawson, D. 1997. Fatigue, alcohol and performance impairment. *Nature*; 388 (6639).
- Gandevia, S.C. 1992. Some central and peripheral factors affecting human motoneuronal output in neuromuscular fatigue. *Sports medicine*, (Auckland, N.Z.) 13 (2): 93-8. doi:10.2165/00007256-199213020-00004. PMID 1561512.
- Golla, Anne Marie; Victoria Vernon. 2006. Late for dinner again: Do work schedules and home schedules clash? Washington, DC 54 p.
- Greenhaus, J.H., Parasuraman, S. and Collins, K.M. 2001. Career involvement and family involvement as moderators of relationships between work-family conflict and withdrawal from a profession, *Journal of Occupational Health Psychology*, 6(2), pp 91-100.
- Harrington, J. 1978. Shift work and Health: A critical review of the literature. London: Her Majesty's Stationary Office.
- Hawley, J.A. and Reilly, T. 1997. Fatigue revisited. *Journal of sports sciences* 15 (3): 245-6. doi:10.1080/026404197367245. PMID 9232549.
- Katie Moraes de Almondes and John Fontenele Araujo, 2009. The impact of different shift work schedules on the levels of anxiety and stress in workers in a petrochemical company. *Campinas* 26(1).
- Lavie, P. 1996. The enchanted world of sleep. London: New Haven.
- Lipp, M. N. 2000. Lipp's inventory of stress symptoms for adults in federal civil servants of Sao Paulo. *Brazilian Journal of cognitive therapies*.
- Michael-Briand, C., Choppard, J. and Guilot, A. 1981 The pathological consequences of shiftwork in retired workers. In: Reinberg A, Vieux N, Andlauer P, editors. Night and shift work: Biological and social aspects. Oxford: Pergamon Press.
- Ohayon, M.M. et al. 2002. Prevalence and consequences of sleep disorders in a shift worker population. *J Psychosom Res* 53(1), pp 577-583.
- Presser, H.B. 2003. Working in 24/7 Economy: Challenges for American families. NY:Russell Sage Foundation.
- Rose, M., Ware, J., Kolm. P. and Risser, M. 2000. Residual effects of call on sleep and mood in medical residents. *sleep*. 23, pp 252-4.
- Spielberger, C. D., Gorsuch, R. L. and Lushene, R. E. 2008. Trait anxiety in university students from Aracaju (SE). *Psychiatry Journal*. Available from <http://dx.doi.org/10.1590/S0101-81082008000100007>.
- Williams, E., Magid, K. and Steptoe, A. 2005. The impact of time of waking and concurrent subjective stress on the cortisol response to awakening. *Psychoneuroendocrinology*, 30 (2), pp 139-148.
- Work Australia. 2009. Work-related injuries in Australia, 2005-06: The impact of shiftwork on work-related injuries in Australia: Safe work Australia.
