



## A STUDY TO EVALUATE THE EFFECT OF SHIFT WORK ON SLEEP QUALITY, FATIGUE LEVEL AND QUALITY LIFE AMONG THE SECURITY PERSONNEL IN RURAL AREA.

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**ABSTRACT** **BACKGROUND:** Shift working has several impacts, one of which being disruption of circadian rhythm which causes decrease in the quality & quantity of sleep, consequent fatigue and affects the quality of life of workers. The aim of the study was to evaluate the effect of shift work on sleep quality, fatigue level and quality of life among the security personnel in rural area who were having shift work schedule. Methods: A descriptive study was conducted in 2019, among the security personnel in rural area. The target population consisted of all the security guards out of which 100 participants were selected according to inclusion and exclusion criteria by simple random sampling. Each participant was assessed using the Survey of Shift Workers (SOS) Questionnaire. Results: The result of the Survey of Shift workers showed that the mean±SD of all the domains are as follows sleep quality as 76.51±7.61; fatigue level as 10.99±1.72; social & domestic disturbances as 6.93±3.02; physical health as 36.97±8.51; and general health as 20.32±4.23. Conclusion: The study concluded that the security personnel who were working in shifts showed impaired sleep quality, fatigue level and quality of life, which was found to be significantly hampering their work performance.

**KEYWORDS :** Shift Work, Circadian Rhythm, Sleep, Fatigue, Sos Questionnaire

### INTRODUCTION:

“A method of work organization under which groups of workers succeeds each other at the same workstations to perform the same operations” is called as shift work, as per the International Labour Office.<sup>[2]</sup> In the security employees the shift work has been characterized as an unusual or irregular work schedules, operating outdoor the regular daily running hours. They frequently work for long, extended and irregular shifts, a substantial proportion of which occurs at night.<sup>[3]</sup>

Shift work and job schedule adversely disturbed the own family lifestyles and a poorer quality of life were observed in shift workers especially in those who were working in permanent night shifts compared with day shift workers.<sup>[6]</sup> Adverse effects of shift work on health status encompass sleep problems, repeated and prolonged fatigue, bodily and psychological issues, cardiovascular, gastrointestinal, and musculoskeletal diseases and modifications in occupational performance and attitudes.<sup>[4]</sup> Some of these signs and symptoms were temporary or associated to particular stages of shift work schedule such as night time-shift work. These symptoms might also disappear throughout holidays or day shift schedule. Sometimes these signs and symptoms might indicate the risk of chronic disease. The occurrence of gastrointestinal problems was higher in night shift employees (20-75%) in comparison with that in day employees (10-20%).<sup>[6]</sup> The outcomes of shift work were structured into three broad categories:<sup>[3]</sup>

1. Acute disturbance of circadian rhythms, including the sleep-wake cycle.
2. Bodily and psychological disturbances.
3. Social and domestic disruption.

On average an adult needs 7-9 hours of sleep each night, whereas teenagers needs 9.5 hours, and infants needs 16 hours/day.<sup>[7]</sup> Shift work has been identified as a major cause of sleep loss and sleepiness in shift workers which can also affect the quality and quantity of sleep in security personnel.<sup>[5]</sup>

Fatigue is a simple phenomenon experienced by every human, can result from multiple biological and social factors including- circadian rhythm, lifestyle, and task workload. The fatigue level of an individual can cause from sleep loss, time of day of wakeup and sleep periods, duration and mental difficulty of the tasks. The chronic fatigue is frequently reported by shift workers.<sup>[3]</sup> Shift workers also tend to engage in more solitary activities than do day workers. Individuals on rotating or irregular shift schedules may also experience severe difficulty in managing to adapt their leisure activities to these patterns.<sup>[3]</sup>

The Survey of Shift workers (SOS) Questionnaire is designed to assess two types of problems: acute (sleep disturbances and alertness problems) and chronic (chronic fatigue, physical and psychological

problems, and social & domestic disturbances).<sup>[4]</sup>

### MATERIALS AND METHODS:

An approval for the study was obtained from the Institutional Ethical Committee (Ref no-PIMS/DR.APJAKCOPT/IEC/2019/457). The study was conducted in Community Physiotherapy OPD of Dr. APJ Abdul Kalam College of Physiotherapy. 100 participants aged between 25-55 years, both males and females willing to participate were included. Exclusion criteria consisted of history of any trauma, recent surgical history and pregnant females. The informed written consent was obtained prior to the study. 100 participants were randomly selected and the information on Survey of Shift workers Questionnaire was obtained from all.

Demographic data was collected, and each participant was analyzed by the Survey of Shift workers (SOS) Questionnaire to identify the problems of shift workers such as sleep disturbances, alertness problems, chronic fatigue, physical and psychological problems and social and domestic disturbances as these problems are associated with different types of shift system.

Survey of Shiftworkers (SOS) Questionnaire: This questionnaire was used to collect the data on the effects of shift work. And to assess the effects of shift work on security guards health and includes the questions about the demographic variables of guards and personal, social and family life satisfaction among shift workers.

The SOS questionnaire includes 57 questions for the shift workers. This questionnaire consists of three parts:

#### 1. GENERAL INFORMATION:

includes the sequence, scheduling and duration of shifts, number and order of shifts, and the workload of different shifts (1 question).

#### 2. INDIVIDUAL DIFFERENCES:

includes the general biographical data (age, gender, work experience, shift work experience, and domestic situation), and the morningness scale (1 question), flexibility of sleeping habits scale (1 question), pacing of job scale (1 question) and shift work system advantages scale (1 question).

#### 3. SHIFTWORK TOLERANCE:

This measures the sleep quality and difficulties associated with morning, evening, and night shifts and rest days (7 questions). It also includes the chronic fatigue scale (3 questions), the retrospective alertness rating scale for morning, evening, and night shifts (3 questions), the neurotism scale based on the Eysenck Personality Inventory (6 questions), social and domestic disturbances scale (3 questions), and the physical health scale with subscales measuring digestive symptoms (8 questions), cardiovascular symptoms (8 questions), mild infections (1 question), musculoskeletal pain (4

questions), and general health questionnaire to diagnose minor psychiatric disorders (12 questions).

The Survey of Shift workers questionnaire is of eight pages in length and it takes 10 to 20 min to complete. Higher scores on the Survey of Shift workers (SOS) questionnaire indicate the higher number of reported difficulties.<sup>[6][7]</sup>

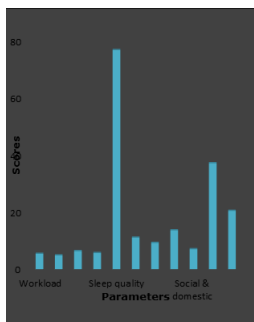
**RESULTS:**

The sample composed of 100 security guards has mean age of 33.3±25.10 years. Mainly the survey participants are 60% males and 40% females. The result of the Survey of Shift workers shows the mean±SD of the following domains are as follows, workload as 5.34±2.68; job pacing as 4.77±0.85; morningness as 6.26±3.15; sleep habit as 5.61±3.07; sleep quality as 76.51±7.61; fatigue as 10.99±1.72; alertness as 9.15±4.83; Eysenck Personality Inventory (EPI) as 13.53±1.63; social & domestic disturbances as 6.93±3.02; physical health as 36.97±8.51; and general health as 20.32±4.23 as shown in Table No.1.

**Table 1: Showing mean±SD values of the following domains.**

| PARAMETERS                       | Mean  | SD   |
|----------------------------------|-------|------|
| Workload                         | 5.34  | 2.68 |
| Job pacing                       | 4.77  | 0.85 |
| Morningness                      | 6.26  | 3.15 |
| Sleep habit                      | 5.61  | 3.07 |
| Sleep quality                    | 76.51 | 7.51 |
| Fatigue                          | 10.99 | 1.72 |
| Alertness                        | 9.15  | 4.83 |
| Eysenck personality inventory    | 13.53 | 1.63 |
| Social and domestic disturbances | 6.93  | 3.02 |
| Physical health                  | 36.97 | 8.51 |
| General health                   | 20.32 | 4.23 |

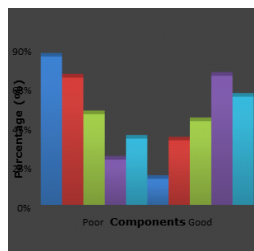
**Figure 1: Graphical representation of mean wise distribution of the following domains.**



**Table 2: Tabular distribution of characteristics of samples of survey.**

| Components | Sleep quality | Fatigue level | General health | Physical health | Social & domestic disturbances |
|------------|---------------|---------------|----------------|-----------------|--------------------------------|
| Poor       | 85%           | 73%           | 52%            | 26%             | 38%                            |
| Good       | 15%           | 37%           | 48%            | 74%             | 62%                            |
| Total      |               |               | 100%           |                 |                                |

**Figure 2: Graphical representation of sleep quality, fatigue level and quality of life.**



As shown in Table No.2, the results of the survey shows that 85% people had poor sleep quality while 15% had good sleep quality; 73% people had severe fatigue conditions, while 37% had mild fatigue level ; the quality of life of the samples showed that the 52% people had poor

general health, while 48% had good quality; the physical health is poor in 26% people and 74% had good physical health; and 38% people had poor social & domestic life, while 62% had good quality of life. The study shows significant results.

**DISCUSSION:**

The aim of the study was to assess the sleep quality, fatigue level and quality of life among the security personnel in rural area who were working in different shifts. Each participant was screened by using the Survey of Shift workers questionnaire to identify the problems of shift workers associated with different types of shift systems. As shift work disturbs the circadian rhythm and lack of sleep, many security guards reported that they had fallen asleep during work and made mistakes due to low alertness and fatigue.

The present study concluded that the score of Survey of Shift workers (SOS) questionnaire was 196±23.95, with total score ranging from 103 to 285. In this study, of 100 participants, 60% were males and 40% were females; the majority (61%) belonged to 25-35 years of age group. Similarly, Kaushik Nag *et al.* at Tripura (India) showed majority from 20 to 30 years' age group (65.9%). The present study also showed the predominance of males which is of 60% whereas similar study by A. Wisetborisut *et al.* in Thailand showed that 76% were males. The study concluded that out of the 100 security guards, the sleep quality is impaired, in which 85% had poor sleep quality, while 15% had good sleep quality. In security personnel the frequencies of night shifts are high i.e., 91%. Mostly working on the irregular shifts such as the night shift work can cause circadian rhythm disruption because of that the total sleep time is lost in security guards. A similar study was conducted by Stevan Dam Sunarnoet *al.* at Universitas Indonesia Security showed that 85.3% of the participants in their study had poor sleep quality.

Due to disturbance of circadian rhythm leads to sleep loss and fatigue which is common complaint in shift workers. Our study also concluded that 73% people had severe fatigue, while 37% had mild fatigue. Working at night shifts has been suggested to be associated with deleterious consequences of general health as a consequence of disturbance of circadian rhythm. The findings of the current study are consistent with those of other studies and suggest that the shift workers suffer more from fatigue than the day workers do. The study shows significant results in rural setting, and yet some evidences agree with our results. The study done by Stevan Dam Sunarnoet *al* shows similar results that out of 150 UI campus security officers 76 respondents, or 50.7% had severe fatigue conditions, while 74 (49.3%) had mild fatigue. Another study done by Zahra Zamanian *et al* shows similar results as our results that is fatigue level is higher in security guards mostly who work at night shifts. In the present study, we also found that the quality of life of security personnel is affected due to shift work. Especially in a large hospital the workers experienced mental stress during the working time. Out of 100 participants, 74% people have higher prevalence rates of cardiovascular complaints, breathlessness, and gastrointestinal complaints reported by the shift workers. Our findings also suggested that the higher number of low back pain, knee pain and ankle pain complaints among the security personnel because of shift work. Similarly, the study done by Leila Omid *et al* shows similar results as our results that among the shift workers there is higher prevalence rates of high blood pressure, cardiovascular, gastrointestinal complaints and musculoskeletal symptoms such as shoulder pain, neck pain and low back pain complaints. Another study done by Attarchi M *et al* shows similar results as our results that the quality of life is affected but in nursing personnel as they also have shift works.

Because of shift work many security guards are employed on shift systems and are exposed to the health risks. Even though the shift work disorder is known as the entity while very few studies have included security guards other than doctors, nurses working in hospitals, police officers unlike ours. The study results recommend that the proper management can lead to reduction in the health related risk factors of shift work. Appropriate planning of shift patterns can lead to increasing the levels of satisfaction among the shift workers.

**CONCLUSION:**

This study concluded that the security personnel who were working in shifts showed impaired sleep quality, fatigue level and quality of life, which was found to be significantly hampering their work performance.

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