



## IMPACT OF SHIFT WORKING PATTERN ON MENTAL HEALTH

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### Abstract

**Background-** Health is a multidimensional approach. It involves not only physical aspect but social and mental aspects also. Shift working system is a method used by almost all organisations to produce result within the given time frame. These shift working hampers the normal circadian rhythm of an individual leading to various health related issues; and serves as one of the reason behind various non-communicable disease. It also affects the productive capacity of the affected individual in long run.

**Aim-** To assesses the prevalence and level of anxiety and mental stress among individuals working in shift system.

**Material & Method-** It is a cross sectional comparative study conducted on 360 individuals working in shifts and 280 individuals are non shift (day time) workers. Semi structured pro forma was used for socioeconomic and demographical data. DASS21 questionnaire was used to assess the levels of anxiety and mental stress. Appropriate statistical tests were applied to analyze the data.

**Results-** Compared with day time non rotatory workers, shift workers shows signs of mental stress and anxiety. Shift workers also complains about difficulties to sleep and loss of interest towards their work.

**Conclusion-** Shift working pattern have significant impact on involved individual health status. It is a double edge sword on one hand it affects the mental status of the individual while on other hand in affects the productivity of affected individual for the organisation too.

**Keyword-** Anxiety, Demographic profile, Mental Stress, Shift work, Socioeconomic profile,

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## Introduction

WHO defines health as ‘complete physical, mental and social well being and not merely the absence of disease or infirmity.’<sup>1</sup> From above definition we know that health is not only about its physical aspect but also mental and social aspects.

From above definition health is a multidimensional concept. It can be physical, social, spiritual, mental, emotional, vocational, cultural, nutritional etc. The mental health aspect from the definition of health is tricky. A mentally healthy person is not just a person who doesn't show any symptoms of mental illness. "Mental health is a state of balance between the individuals and surrounding world, a state of harmony between oneself and others, a coexistence between realities of the self and that of other people and that of the environment".<sup>2</sup> It is also defined as “a state of well being in which an individual realizes his/her abilities, can cope with normal stress of life, can work productively and is able to make a contribution to his/her community”.<sup>3</sup>

We have laboratory parameters to assess the physical health of an individual by means of various pathological tests, microbiological tests and radiological assessments but all these investigations are of little value when it comes to diagnosis of mental illness.

All these investigation are required to rule out other probable causes but the ability to become sole tool for the diagnosis in case of mental illness is missing in these parameters.

There are various questionnaires available to diagnose the mental illness and categorise them as per their severity.

India is a developing nation. It is working day and night towards betterment in overall fields to boost the desired GDP. It ultimately leads to the creation of an environment; where all the teams in market compete to perform better and better.

In order to attain the target the team have to complete its allotted task within time which requires its function on 24 by 7 hours.

To work efficiently a company deploy shift working system. A shift working system is the system where an employer divides its employee into small groups to perform their allotted tasks, within the given time frame. It ultimately results into functioning of that factory /institution /organization all day and night to achieve its target or to provide its services<sup>4</sup>.

Human body functions as per the set circadian rhythm. Circadian rhythm is a 24 hour cycle of the changes that occurs within the body in terms of physical, mental and behavioural responses. It is a

natural process that reacts primarily to day- night, light- dark etc. It occurs in all living things<sup>5</sup>.

In order to counter the overall disease burden and reduction in the morbidity and mortality due to non communicable diseases collectively Ministry of health and family welfare launched a national programme during the 11<sup>th</sup> five year plan period<sup>5</sup> ie; national programme for prevention and control of cancer, diabetes, cardiovascular disease and stroke.

Shift work system affects the normal day to day routine of working individual. Especially individuals working in night rotator shifts, they often disturb their sleep and harmony of their work. It also hampers their life quality and disturbs their social life and family relationships. Some researchers have considered that disturbed sleep cycle is one of the common causes behind quitting their shift work system jobs<sup>6,7</sup>.

Disruption in circadian rhythm also affect various endogenous biological rhythm which collectively leads to impaired responses and feeling of sleepiness during all the time of day to day activities<sup>8</sup>.

Individuals of different sectors working in shift working system often report for poor sleep quality and complains of insomnia<sup>9</sup>. There are other contributory factors also like stress, fatigue, age etc which may alter a quality sleep cycle.

Ohayo MM et al have suggested in their study that actual sleeping period is way moreshorter approximately one to four hour for an individual working in a shift working system as compare to an normal individual<sup>10</sup>.

This disturbed sleep have resulted in various implications for individuals working in shift working system, various studies have suggested that these individuals often suffers from lesser productive actions, reduced quality of life, more prone toward accidents, decreased health equilibrium<sup>11,12</sup>.

These peoples working in shift system are often prone to use and becomes addicts with time of various intoxicants like tobacco products, alcohol, sleeping pills etc<sup>13</sup>.

Almondes et al. (2009)<sup>14</sup> observed in their study that workers who work in day and night shifts have higher prevalence of anxiety, mental stress. Another important fact revealed by a study conducted by Smith L et al. (1993)<sup>15</sup> in which they assess the mental health of the partners of workers working in shifts. They found out that not only workers but their partner suffers too with mental ill health due to working shift of their partners. They

observed the relation between shift working hours and prevalence of depression, anxiety and mental stress.

### AIMS AND OBJECTIVES

1. To assess the prevalence of mental stress and anxiety among shift workers
2. To compare the prevalence of mental stress and anxiety between shift workers and non shift workers.

### METHODOLOGY

It is community based cross sectional observational study. It included 360 workers who are working in rotatory working shift pattern and 280 workers, who are day time workers only.

The study was conducted from January 2019 to June 2020, which includes data collection, analysis and interpretation of data.

The study was conducted after taking permission from Institute Ethical committee.

The employers which were included in study were selected with lottery random sampling method.

Before assessments of workers, a prior meeting with employer was fixed, the employer was elaborated regarding nature of study and related information, only with due approval from employer, workers were approached for study. Only after taking consent from workers in their language they were included in study as per the selection criteria.

After initial sensitization regarding the aims and purpose of the study, the socio economic data were collected by semi structured pro forma and for further assessment of anxiety and mental stress a pre- designed and pre-tested questionnaire DASS21 were used<sup>16</sup>.

DASS 21 is comprises a total of 21 questions, targeting specific questionnaire for mental stress,

anxiety and depression as well. There are four score from zero to three; given for each question. Depending upon response from the participants they are classified to be suffering from mental stress and anxiety which further can be categorised as mild, moderate and severe form of the disease.

Inclusion criteria –

- All those workers who are willing to participates were included in the study.

- Age more than 18 years

Exclusion criteria-

- Workers who were absent at the time of study
- Workers with co morbid condition

### STATISTICAL ANALYSIS

Descriptive and appropriate statistics such as Chi-square, *t*-test, were used for statistical evaluation and analysis of collected data. (p value ,0.05 was considered as significant)

### OBSERVATION AND RESULT

A total of 640 individuals were enrolled for study. Out of them 360(56.25%) individuals were working in shift pattern while 280(43.75%) were having a fixed day time job profile.

Age distribution was significant for both mental stress and anxiety, as it shows p value <0.05, [Table1]

However, marital status was only found to be significant in anxiety with p value <0.05, not in case of mental stress. Gender wise distribution was not found to be of any significance in both cases ie; Anxiety and Mental stress [Table 2]

There is significant relationship between shift work and anxiety as per statistical analysis which was insignificant for people suffering from mental stress

**Table 1** Relation of shift work and prevalence of anxiety and mental stress

| Sr. No. | Working pattern   | Anxiety (%) | Mental Stress(%) |
|---------|-------------------|-------------|------------------|
| 1       | Shift workers     | 157 (43.61) | 70 (19.44)       |
| 2       | Non shift workers | 80 (28.57)  | 52 (18.57)       |
| 3       | Total             | 237         | 122              |

**Table 2** Age wise Distribution of Participation Suffering from Stress

| Variable | Stress          |      |                |      | T test value | p value |
|----------|-----------------|------|----------------|------|--------------|---------|
|          | Present (n=122) |      | Absent (n=518) |      |              |         |
|          | Mean            | SD   | Mean           | SD   |              |         |
| Age      | 35.25           | 8.93 | 31.82          | 8.61 | 3.930        | 0.001   |

Table shows age wise distribution of participants suffering from stress with mean age being 35.25 and standard deviation of 8.93.

While, Participants who are not suffering from

stress being mean age of 31.82 and standard deviation of 8.61. The finding is statistically significant.

**Table 3** Descriptive indicators of demographic data for Mental Stress

| Variables      |             | Stress          |                | X <sup>2</sup> value | df | P value |
|----------------|-------------|-----------------|----------------|----------------------|----|---------|
|                |             | Present (n=122) | Absent (n=518) |                      |    |         |
| Sex            | Male        | 92              | 398            | 0.111                | 1  | 0.738   |
|                | Female      | 30              | 120            |                      |    |         |
| Marital status | married     | 70              | 330            | 8.169                | 2  | 0.168   |
|                | Non-married | 40              | 110            |                      |    |         |
|                | Other       | 12              | 78             |                      |    |         |
| Shift work     | Yes         | 70              | 290            | 0.077                | 1  | 0.780   |
|                | No          | 52              | 228            |                      |    |         |

**Table 4:** Age wise distribution of participants suffering from Anxiety.

| Variable | Anxiety         |      |                |      | T test value | p value |
|----------|-----------------|------|----------------|------|--------------|---------|
|          | Present (n=237) |      | Absent (n=403) |      |              |         |
| Age      | Mean            | SD   | Mean           | SD   | 4.755        | <0.001  |
|          | 35.17           | 8.60 | 31.82          | 8.61 |              |         |

Table shows age wise distribution of participants suffering from anxiety with mean age being 35.17 and standard deviation of 8.60. While, Participants

who are not suffering from anxiety being mean age of 31.82 and standard deviation of 8.61. The finding is statistically significant.

**Table 5:** Descriptive indicators of demographic data for Anxiety

| Variables      |             | Anxiety         |                | X <sup>2</sup> value | df | Pvalue |
|----------------|-------------|-----------------|----------------|----------------------|----|--------|
|                |             | Present (n=237) | Absent (n=403) |                      |    |        |
| Sex            | Male        | 190             | 300            | 2.727                | 1  | 0.098  |
|                | Female      | 47              | 103            |                      |    |        |
| Marital Status | married     | 100             | 300            | 68.627               | 2  | 0.001  |
|                | Non-married | 80              | 70             |                      |    |        |
|                | Other       | 57              | 33             |                      |    |        |
| Shift work     | Yes         | 157             | 203            | 15.277               | 1  | 0.0009 |
|                | NO          | 80              | 200            |                      |    |        |

## DISCUSSION

In this ever growing world, where shift working is a fact and a method to finish the target at earliest, it is mandatory to know the after effect of shift working over health.

In our study, age difference among shift and non shift workers for both mental stress and anxiety was significant

## CONCLUSION

Decreasing the level of anxiety and mental stress among workers may lead them in better and more productive result in their work. One should focus on overall mental well being and should working on decreasing the reason behind it like shift or rotation working style.

## CONFLICT OF INTEREST

None

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