

## Assesment of State and Trait Anxiety Levels in Shift Employees Vardiya Çalışanlarında Anlık Ve Sürekli Kaygı-Durum Değerlendirmesi

Hülya Çakmur

Ass.Prof.Dr., Kafkas University Faculty of Medicine, Department of Family Medicine, Kars, Turkey

### Abstract

**Objective:** Aim of the study is investigation of “state and trait anxiety situation” changes of shift employees according to working duration and work load.

**Materials and Method:** The type of the research is a cross-sectionalal. Study was performed between May-July 2001. All of the employees working in the shift system of a state hospital in Izmir, were selected for the study group. Data were collected with Spielberger’s (State-Trait Anxiety Inventory) instantaneous and continuous anxiety situation evaluation scale and individual information forms inquiring socio-demographic characteristics.

**Results:** Results of the study show that all shift employees of the healthcare possess a moderate anxiety. Although gender, profession, marital status and economical situation perception are not effective on this result, it is observed that the anxiety significantly raises with age. Only the voluntary group had high satisfaction rates but state and trait anxiety rate was also not low in this group.

**Discussion:** It is obligatory to create innovative working environments and requirements in accordance with the human nature in order to derive the maximum efficiency from the working hours and not to execute similar mistakes by benefiting from the results of the applications worldwide. If this system is applied by improving the physical conditions of the working environment and financial support to the employees, then satisfaction of the person receiving the service will be provided along with relative protection of the health of the health care workers.

**Key words:** Anxiety, health personel, shift work

### Özet

**Amaç:** Bu çalışma ile vardiya çalışanlarının çalışma süre ve sıklığına göre “anlık ve sürekli kaygı durum” değişimlerini incelemek amaçlanmıştır.

**Gereç ve Yöntem:** Araştırmanın tipi kesitseldir. Çalışma, Mayıs-Haziran 2001 tarihleri arasında planlanmıştır. İzmir’de bir devlet hastanesinde vardiyalı sistemde çalışan tüm sağlık personeli çalışma grubu olarak belirlenmiştir. Çalışma verileri; Iberger’in “anlık ve sürekli kaygı durum değerlendirme ölçeği” ile bireylerin sosyodemografik belirliyecilerini sorgulayan kişisel bilgi formu ile toplanmıştır.

**Bulgular:** Araştırmanın sonucu, vardiya sisteminde görev yapan tüm sağlık çalışanlarının orta derecede kaygılı olduklarını göstermiştir. Cins, meslek, medeni durum ve ekonomik durum algısı sonucu etkilemezken yaşla birlikte kaygı, anlamlı derecede yüksek bulunmuştur. Yalnız gönüllü çalışanlar arasında hoşnutluk oranı yüksek bulunmasına karşın bu grupta da anlık ve sürekli kaygı oranı düşük bulunmamıştır.

**Tartışma:** Vardiyalı çalışma sistemi günümüzde neredeyse bir gerekliliktir; bu nedenle diğer ülkelerin olumlu-olumsuz sonuçları incelenerek, benzer yanlışların yinelenmemesi ve çalışma saatlerinden en yüksek verimin elde edilebilmesi için yenilikçi, insan doğasına uygun, çalışma ortam ve koşullarının oluşturulması kaçınılmazdır. Çalışma alanının fizik koşulları iyileştirilerek, çalışanlara sağlanacak maddi destekle bu sistem uygulanırsa, hem sağlık çalışanlarının sağlığı görece korunup hem de hizmet alanların hoşnutluğu sağlanabilir.

**Anahtar sözcükler:** Anksiyete, sağlık çalışanları, vardiyalı çalışma

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### Introduction

Circadian rhythms show a 24-hour oscillation pattern, in metabolic, physiological and behavioral functions of almost all species, due to a fundamental adaption

to rotation of earths’ round its own axis (1). The mammalian circadian system, which is comprised of multiple cellular clocks located in the organs and tissues, orchestrates their regulation in a hierarchical manner throughout the 24 hour of the day (2).

The working hours which are not organized accordingly with the human biorhythm (8:00-17:00) are described as shift hours (3). Shift systems involve periods of 6–12 hours work at a time with the shift crews alternating on two, three, or four shifts in any 24 hour period (4). Especially in the health and safety field, night work or shift work is mandatory. This system functions in this way in all developed countries and there are many employees in this field. In Turkey, the shift system in outpatient care was initiated in 1999 by the Ministry of Health in order to relieve the accumulation which resulted due to not being able to develop an effective dispatch chain in the first step of our country's health services. By giving polyclinic services between 16-24 pm., an efficient utilization of the hospitals was aimed (3).

Regarding that all healthcare staff is within night work, the addition of outpatient services to shift work has led to discontent among healthcare workers (5). This study was designed to examine whether this situation causes detectable anxiety or not. The underlying motivation for this study is to provide a consideration about how for health personnel can create a structure which delivers the best possible service along with maintaining their own health.

## Method

### The type of the research:

It is a cross-sectional study. All the employees working in the shift system of a state hospital in Izmir were included (n:50). For the collection of data Spielberger's (State-Trait Anxiety Inventory) instantaneous and continuous anxiety situation evaluation scale and individual information forms which were completed personally with a face-to-face observation were used. Ethics committee approval for this study were not taken. But necessary approval from the hospital management were received and verbal informed consent was obtained from each individual before study according to Helsinki Declaration.

### Scoring method of the scale:

Spielberger's State Anxiety Inventory consists of 20 items that ask how a person feels now, and reflects situational factors that may influence anxiety levels. Scores range from 20 to 80 and the higher scores reflect greater level of anxiety.

### Personal information form:

This is a 11 item data collection form consisting of

close-end questions which inquire the age, gender, marital status, educational status, profession, economical situation perception, work load, working time, working frequency, voluntary working and considering "this system is useful".

### Variables of the study:

As dependent variables; The test result points of Spielberger's questions which were approved for their validity and reliability, each composed of 20 questions about the evaluation of state and trait anxiety situation evaluation (State- Trait Anxiety Inventory) were utilized.

As independent variables; age, gender, marital status, educational status, profession, economical situation perception, the type of work in the shift system (assorted as rotational-continuous, continuous system working hours are everyday between 16:00-24:00), if rotational system is selected then the working frequency (classified as 1-3 times, 4-7 times and more than 8 times in a month) voluntary working, the period of labour spent in this system and if the shift system is regarded as beneficial or non-beneficial by the applicants and if they are satisfied by working in this system or not, were evaluated.

### Data analysis:

Statistical analysis was done with the help of SPSS 13.0 package program. In descriptive analysis; frequencies, means and standart deviation investigated. In constant variables which were anticipated to relate with each other; Spearman correlation analysis was the choice. Chi-square, Fisher's Exact Test was applied and "p<0.05" accepted as significance cut-off value.

## Results

In the study group the rate of access was 94.0%. The data which remained unanswered in some questions were left out of the evaluation. The average age of the group was 29.07±5.45 with the age interval 19-49. Of the employees; 57.4% were female, 42.6% male, 2.1% were elementary school, 4.2% junior high school, 23.4% senior high school and 70.2% university graduates (52.2% physician, 29.8% nurse, 10.1% secretary, 7.9% security personnel). The rate of marriage was 55.3% and 15.2% had a good economical situation perception whereas in 61.0% this perception was medium and in 23.8% bad. The percentage of continuous shift employees was 31.9% and rotational shift employees 60.9% (Table 1).

The working period in the shift system for 6 months or less was 44.4% and for 19-24 months was 24.4%. 48.9% of the employees active in the system detected it as beneficial for the applicants; whereas 48.9% reported it as unprofitable and 2.2% didn't have any comments. While no difference was obtained between the groups with regard to working period and frequency about the benefit of the shift system, there was a significant difference among the continuous and rotational systems according to effectiveness (Fisher's  $p:0.000$ ).

The rate of not interpreting the shift system as beneficial was higher in the rotational system. No significant difference was determined with regard to satisfaction between the continuous and rotational system employees (Fisher's  $p:0.143$ ). There was a significant difference between the voluntary and involuntary shift employees with regard to satisfaction obtained from the system (Fisher's

$p:0.000$ ). While 76.5% of the voluntaries were content with the system; only 14.3% of the involuntaries reported that they were glad to be within this system. State and trait anxiety situation evaluation displayed that there was medium anxiety in the whole group. While the state anxiety situation score average in the whole group was  $45.24 \pm 12.50$  (the lowest score 21, the highest score 75), the trait anxiety score average was  $43.9 \pm 9.16$  (the lowest 25, the highest 63). With regard to state and trait anxiety situation, no statistically significant difference was observed between the groups according to working frequency and duration (state  $p:0.797$ , trait  $p:0.728$ ). Although the state anxiety score average was found to be higher in the rotational shift employees, this was statistically not important in Fisher's exact test. No suggestive correlation was detected between the state and trait anxiety situation results with regard to age. But a correlation in the positive direction was determined (correlation coefficient  $r:0.496$ ,  $p:0.001$ ).

**Table 1.** Sociodemographic and economic characteristics of the shift employees in hospital

Characteristic	%
<b>Gender</b>	
Female	57.4
Male	42.6
<b>Educational Status</b>	
Elementary school	2.1
Junior high school	4.3
Senior high school	23.4
University graduates	70.2
<b>Professional Status</b>	
Physician	52.2
Nurse	29.8
Secretary	10.1
Security Personnel	7.9
<b>Marital Status</b>	
Married	55.3
Single	44.7
<b>Economical Status Perception</b>	
Good	15.2
Medium	61.0
Bad	23.8
<b>Shift Working Status</b>	
Continuous shift employees	39.1
Rotational shift employees	60.9

## **Discussion**

The shift system in polyclinic services started with 13 hospitals in Turkey at 2003. This number had reached 82. But during this process due to the complaints of the employees and the low productivity in some areas, this system was ceased to be compulsory although it is still maintained in some hospitals today (3,5).

Fifth European Working Conditions Survey shows that night work is carried out by 19% and shift work by 17% of all workers in Europe (6). Especially after the industrial revolution, the importance of working hours within life, health and the well-being of workers have been better understood (7). Numerous studies have been conducted regarding the negative effects of night work or shift work on employees which has been expansively utilized in developed country for a long time.

These studies which investigate the correlation between shift working and healthcare problems have shown that shift working is responsible for the breakdown of the circadian rhythm in metabolic problems from subclinical hearth disease to coronary heart diseases, metabolic syndrome, obesity, breast cancer, disorder of female reproductive function and anxiety (8,9,10,11,12,13,14,15).

In a study conducted in Turkey it has been shown that the cognitive functions of night shift working anesthesia assistants are impaired and the attention and anxiety levels are affected (16).

In this study; state and trait anxiety situation evaluation displayed that there was a medium anxiety presence in the whole group. Influence of night shift work on psychological state and cardiovascular and neuroendocrine responses in healthy nurses in Japan have shown psychologic disturbances associated with altered cardiovascular and endocrine responses after night shift (17). Another Japanese study has demonstrated intense anxiety in women working three-shift (18). The fact that women are affected more from the drawbacks of the shift system has been shown in numerous studies. The neuroendocrine circuits which regulate the female reproductive functions effect fertility in a negative way with the deterioration of the circadian control (13).

The relationship between breast cancer and night shift work has long been discussed. In 2007, the

International Agency for Research on Cancer classified shift work involving circadian disruption as probably carcinogenic to humans (group 2A), primarily based on experimental and epidemiologic evidence for breast cancer (11). Night shift work exposure has been recently considered as one of the significant breast cancer risk factors in industrialized countries. A positive correlation between night shift work and breast cancer was described in 8 out of 12 studies in a recent meta-analysis study (19). The biomolecular mechanism that triggers the relationship between breast cancer and night shift work is not completely known. It is not clear if the impaired melatonin secretion due to light exposure or the anxiety caused by irregular working plays a more effective role.

There are studies which show a correlation between weight gain and shift work (10,20). Similarly there are also studies which demonstrate a significant relation between depression, anxiety and weight gain (21,22).

There is general agreement that working abnormal hours leads to anxiety and physical fatigue. This situation has been proved with studies all around the world. These studies have also proved that shift working leads to undesired situations such as low production and accidents. In a study conducted in the United States of America, it has been concluded that there was an increase in motorcycle accidents of interns working expansively in the shift system (23).

In another study, it was seen that there was an increase in the somatic complaints of physicians who have long working hours (24).

There are also studies on the subject that long working hours of the health employees threaten the patient safety (25). In a study conducted in Sweden, it has been shown that working at least for three years in a shift job before 20 years of age doubles the possibility of multiple sclerosis (26). The unfavorable effect of long working hours on health has been the subject of debate in all fields for many years. The European Union suggests the resting period in a day as 11 uninterrupted hours, at least one day in a week and one month in a year (4).

There is no possibility to mention worktime control or flexibility in field of health and security. Moreover in a study include the dataset of Third European Survey on working conditions involving 21505 workers, had been reported the flexibility and

variability of working hours appeared inversely related to health and psychosocial wellbeing (27). Although studies on a molecular basis are needed for the real cause of health problems caused by the shift system; the need and demand for this service field outside the normal working hours increases due to technical, economical and social causes.

### Limitations of the study

The serious limitation of this study is the lack of a control group. But this study has been done only for condition determination. In case an evaluation had been made between shift and normal period employees regarding the state and tarit anxiety situation without considering the fact that the employees were voluntary or involuntary in the shift system or if they worked continuously or rotationally, there would have been a more definite data whether the shift system really caused anxiety or not. Another limitation of this study is the small sample group. However this is the number of the total shift workers in the hospital where this study was conducted.

### Conclusion

The shift system is almost a necessity in today's world and by providing concrete support through the optimization of the physical conditions of the working area and applying this system with voluntarism being fundamental, both the protection of the healthcare employees and contentment of the service fields can be accomplished. It is obligatory to create innovative working environments and requirements in accordance with the human nature in order to derive the maximum efficiency from the working hours and not to execute similar mistakes by benefiting from the results of the applications worldwide.

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### **İletişim:**

Assist.Prof.Dr. Hülya Çakmur  
Kafkas University Faculty of Medicine  
Department of Family Medicine, Kars, Turkey  
Tel: +90.532.5935058  
E-mail: hulyacakmur@gmail.com