

Evaluation of Sleep Quality of Anesthesiologists Working in Turkey

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Abstract

Objective: Sleep is one of the basic daily activities that are important for an individual with physical, mental, social, and intellectual needs to be in good physical and mental health. Although many definitions are made, sleep; is a complex and physiological event affected by pathophysiological, physical, psychological, and environmental factors. Anesthesiologists often work in closed environments and with long working hours, which can cause severe, chronic sleep loss and sleep disruption. Sleeplessness and low sleep quality can cause decreased attention during the day, impaired judgment, and delays in decision-making. This study, it is aimed to determine the sleep quality of Anesthesiology and Reanimation specialists working in Turkey.

Methods: The study included all anesthesiologists whose e-mail addresses were registered with the Turkish Society of Anesthesiology and Reanimation and who worked in Turkey. Survey questions, which the participants can answer electronically, were sent to the participant's e-mail addresses. To increase the number of participants, a reminder email was sent three weeks after the first email. The data were expressed as a number, percentage, mean, and standard deviation and the correlation between the parameters will be evaluated at a 95% confidence interval by performing Pearson correlation analysis; $p < 0.05$ was accepted as significant.

Results: Due to seven people with sleep disorders being excluded from the study, 210 out of 217 people who answered the questionnaires sent by email to the anesthetists who are members of the Turkish Society of Anesthesiology and Reanimation were included in the study. Of the respondents who worked in the following fields: 30% (n = 63) State Hospital, 33.3% (n = 70) University Hospital, 17.1% (n = 36) Ministry of Health Affiliate Hospital, 19.5% (n = 41) Private Hospital, and 73.3% (n = 154) at the Operating Room, 10% (n = 21) at the Intensive Care, 15.2% (n = 32) at the Operating Room + Intensive Care, and 1.4% (n = 3) at other departments, 48.4% (n = 105) were male, 51.6% (n = 112) were female, with a mean age of 41.5 ± 7.6 years. The average hourly shift for the participants, 61% of whom were on the night shift, was 50 hours per month, and 25% were working more than 45 hours per week.

Conclusion: The sleep quality of anesthesiologists is poor, which causes daytime dysfunction. It is thought that the reason for poor sleep quality, in general, is the adverse effects of their duties and responsibilities, working environment, and operating conditions on sleep quality.

Key words: sleep quality, Pittsburgh sleep quality index, anesthesiologist, night shift

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INTRODUCTION

Sleep is a state of unconsciousness in which mental and physical activity is suspended, as well as a period of restructuring during which our bodies store energy (1,2). It is known that quality sleep is needed to be healthy both physically and mentally (2,3). Sleep quality includes people's level of alertness and sleep duration while sleeping, in addition to their level of physical and emotional comfort. The Pittsburgh Sleep Quality Index (PSQI), a psychometric and non-polysomnographic test, is used to evaluate sleep quality (4,5).

Sleep and sleep quality are influenced by a variety of physical, psychological, and environmental factors. Sleeplessness and poor sleep quality can lead to decreased attention during the day, impaired judgment, delays in decision-making, and a general decrease in job performance (6–8). Anesthesiologists often work in closed environments and with long working hours, which can cause severe, chronic sleep loss and sleep disruption. Sleeplessness and low sleep quality can cause decreased attention during the day, impaired judgment and delays in decision making.

In this study, it is aimed to determine the sleep quality of Anesthesiology and Reanimation specialists working in Turkey.

METHODS

Ethical approval for our study was obtained from the Clinical Research Ethics Committee of Ordu University at the meeting of 26.04.2018 with decision number CREC 2018/96.

This research is a descriptive study conducted to evaluate the sleep quality of anesthesiologists whose e-mail addresses are registered with the Turkish Society of Anesthesiology and Reanimation and who work in Turkey.

Survey questions, including descriptive questions and PSQI questions that they could answer electronically, were sent to the participants' e-mail addresses. Emails sent were responded to by 217 people and evaluated. Due to seven people with sleep disorders being excluded from the study, 210 out of 217 people who answered the questionnaires sent by email were included in the study.

Pittsburgh Sleep Quality Index

PSQI is a self-report test that evaluates sleep quality and sleep disturbance over a one-month time interval. Firstly, its reliability and validity were demonstrated by Buysse et al. (4). Agargün et al. determined the index's validity and reliability in Turkish society (5). PSQI consists of seven components: subjective sleep quality, sleep latency, sleep duration, habitual

sleep efficiency, sleep disturbance, use of sleeping medications, and daytime dysfunction. Component 1: Subject refers to sleep quality, Component 2: Sleep latency, Component 3: Sleep duration, Component 4: Habitual sleep efficiency, Component 6: Use of sleeping medications, Component 7: Daytime dysfunction. The sum of all components forms the total PSQI score. A total PSQI score above 5 indicates poor sleep quality, and below 5 indicates good sleep quality (5).

Statistical Analysis

The analysis of the research data was conducted using the Jamovi for Linux (Open Stats R based) 1.6.3 package program, and the quantitative data were given as percentages and the qualitative data as mean±standard deviation. Mann-Whitney U and Kruskal-Wallis tests were used to compare dependent and independent variables. Pearson or Spearman correlation analysis was performed for correlation between data. The results were expressed as 95% confidence interval and $p < 0.05$ as significant.

RESULTS

Due to seven people with sleep disorders being excluded from the study, 210 out of 217 people who answered the questionnaires sent by email to the anesthetists who are members of the Turkish Society of Anesthesiology and Reanimation were included in the study. Of the respondents who worked in the following fields: 30% (n = 63) State Hospital, 33.3% (n =

70) University Hospital, 17.1% (n = 36) Ministry of Health Affiliate Hospital, 19.5% (n = 41) Private Hospital, and 73.3% (n = 154) at the Operating Room, 10% (n = 21) at the Intensive Care, 15.2% (n = 32) at the Operating Room + Intensive Care, and 1.4% (n = 3) at other departments, 48.4% (n = 105) were male, 51.6% (n = 112) were female, with a mean age of 41.5 ± 7.6 years. The average hourly shift for the participants, 61% of whom were on the night shift, was 50 hours per month, and 25% were working more than 45 hours per week (Table 1).

Table 1. Characteristics of the Participants

| Categories | n | % or Mean±SD |
|-------------------------|-----|--------------|
| Sex | | |
| Man | 100 | 47.6 % |
| Women | 110 | 100.0 % |
| Hospital | | |
| Government Hospital | 63 | 30.0 % |
| University Hospital | 70 | 33.3 % |
| M.H Affiliate Hospital* | 36 | 17.1 % |
| Private Hospital | 41 | 19.5 % |
| Departments | | |
| Operating Room | 154 | 30.0 % |
| ICU** | 21 | 33.3 % |
| Operating Room+ICU | 32 | 17.1 % |
| Other | 3 | 19.5 % |
| Working Time | | |
| Over 45 h/week | 118 | 56,2 % |
| Under 45 h/week | 92 | 43,8 % |
| Night shift | | |
| Yes | 128 | 61.0 % |
| No | 82 | 39.0 % |
| Age | 210 | 41,35±7,41 |
| Night shift hour/mount | 210 | 51±13,1 |
| PSQI*** | 210 | 6,73±3,11 |
| Sleep time/hour | 210 | 6,35±1,05 |
| Bedtime/minutes | 210 | 417,40±61,66 |

*Ministry of Health

** Intensive Care Unit

*** Pittsburg Sleep Quality Index

While the mean total PSQI score was 6.73 ± 3.1 , 75.2% of respondents had a PSQI total score greater than 5. There was no statistical

difference in total PSQI scores between male and female anesthesiologists ($p = 0.08$). The total PSQI for those on the night shift and those working more than 45 hours per week was assessed as high ($p=0,007$, $p<0,001$). When the participants' departments were compared, no statistical difference in total PSQI scores was found ($p=0,51$). When the PSQI components of those on the night shift and non-night shift were

compared separately, the difference between the scores of components 1, 5, and 7 were found to be significant ($p=0.037$, $p=0,023$, $p<0,001$). When the components were compared separately between male and female anesthesiologists, only the difference between component 5 scores was significant ($p=0.001$) (Table 2).

Table 2. Differences in Pittsburgh Sleep Quality Index Scores According to Participants' General Characteristics

| Variables | Categories | n | Global PSQI | Comp. 1 | Comp. 2 | Comp. 3 | Comp. 4 | Comp. 5 | Comp. 6 | Comp. 7 |
|--------------|-------------------------------------|-----|-------------|-----------|-----------|-----------|-----------|------------|------------|-----------|
| Sex | Male | 100 | 6,31±2,94 | 1,29±0,72 | 1,04±0,94 | 0,89±0,81 | 0,30±0,67 | 1,34±0,60 | 0,11±0,46 | 1,34±0,93 |
| | Female | 110 | 7,11±3,21 | 1,41±0,65 | 1,21±0,95 | 0,79±0,77 | 0,33±0,70 | 1,63±0,63 | 0,19±0,67 | 1,55±1 |
| | <i>p</i> * | | 0,079 | 0,324 | 0,173 | 0,414 | 0,682 | 0,001 | 0,508 | 0,123 |
| Hospital | Government Hospital | 63 | 6,84±2,97 | 1,44±0,61 | 1,17±0,95 | 0,78±0,81 | 0,29±0,63 | 1,54±0,66 | 0,06±0,35 | 1,56±0,94 |
| | University Hospital | 70 | 6,4±3,34 | 1,23±0,70 | 1,03±0,91 | 0,87±0,77 | 0,23±0,64 | 1,44±0,65 | 0,19±0,64 | 1,41±1,0 |
| | M.H Affiliate Hospital ^a | 36 | 6,78±2,92 | 1,36±0,63 | 1,14±0,96 | 0,81±0,78 | 0,42±0,84 | 1,44±0,60 | 0,11±0,52 | 1,5±0,73 |
| | Private Hospital | 41 | 7,07±3,10 | 1,41±0,80 | 1,22±0,96 | 0,9±0,83 | 0,41±0,70 | 1,54±0,59 | 0,27±0,775 | 1,32±1,03 |
| | <i>p</i> ** | | 0,714 | 0,297 | 0,726 | 0,849 | 0,417 | 0,762 | 0,324 | 0,641 |
| Departments | Operating Room | 154 | 6,73±2,99 | 1,38±0,65 | 1,08±0,94 | 0,86±0,80 | 0,27±0,63 | 1,47±0,62 | 0,18±0,63 | 1,49±0,95 |
| | ICU** | 21 | 7,52±3,84 | 1,43±0,67 | 1,38±0,92 | 0,81±0,81 | 0,62±1,07 | 1,62±0,66 | 0,19±0,68 | 1,48±0,98 |
| | Operating Room+ICU | 32 | 6,22±3,23 | 1,22±0,87 | 1,19±0,93 | 0,69±0,78 | 0,34±0,60 | 1,56±0,669 | 0 | 1,22±1,09 |
| | Other | 3 | 6,33±2,08 | 1 | 1 | 1,33±0,57 | 0,33±0,57 | 1 | 0 | 1,67±0,57 |
| | <i>p</i> ** | | 0,518 | 0,493 | 0,57 | 0,48 | 0,178 | 0,356 | 0,415 | 0,52 |
| Working time | Under 45 h/week | 92 | 5,84±3,03 | 1,16±0,61 | 1,08±0,98 | 0,57±0,66 | 0,25±0,62 | 1,43±0,63 | 0,08±0,42 | 1,27±0,92 |
| | Over 45 h/week | 118 | 7,42±2,99 | 1,5±0,71 | 1,17±0,90 | 1,05±0,82 | 0,36±0,73 | 1,53±0,63 | 0,21±0,67 | 1,59±0,98 |
| | <i>p</i> * | | <0,001 | <0,001 | 0,39 | <0,001 | 0,204 | 0,147 | 0,056 | 0,016 |
| Night shift | Yes | 128 | 7,19±3 | 1,43±0,64 | 1,19±0,91 | 0,86±0,81 | 0,3±0,65 | 1,57±0,64 | 0,17±0,62 | 1,66±0,89 |
| | No | 82 | 6,01±3,14 | 1,23±0,74 | 1,04±0,98 | 0,8±0,77 | 0,33±0,73 | 1,37±0,59 | 0,12±0,507 | 1,12±0,99 |
| | <i>p</i> * | | 0,007 | 0,037 | 0,211 | 0,689 | 0,926 | 0,02 | 0,624 | <0,001 |

*U Mann-Whitney test; **Kruskal-Wallis' test; ^a Ministry of Health

In the correlation analysis, there was no relationship between age, hospital, and department of work and PSQI ($r=0.054$ $p=0.440$, $r=0,032$ $p=0,641$, $r=0,037$ $p=0,595$), while a weak correlation was found between working time, night shift, and total monthly night shift time ($r=0.254$ $p<0.001$; $r=0.185$ $p=0.007$, $r=0.217$ $p=0.002$) (Table 3).

DISCUSSION

Anesthesiologists often work in closed environments and with long working hours, which can cause severe, chronic sleep loss and sleep disruption. Sleeplessness and low sleep quality can cause decreased attention during the day, impaired judgment and delays in decision making. There is evidence that working at night

disrupts the circadian rhythm, sleep-wake balance, and nutritional status (9-11). It has even been reported to be associated with metabolic disorders such as cardiovascular system diseases, depression, anxiety, obesity, and diabetes (9,10,12,13). It is pointed out that working at night causes serious problems in terms of employee health as well as serious problems related to patient care and safety (7,13). Short sleep, frequent awakenings, and a long time to fall asleep, all have an impact on sleep quality, as do many environmental, physical, psychological, and physiological factors. (12). It is known that poor sleep quality

caused by sleepiness has negative effects such as drowsiness, deterioration in cognitive functions, staying awake during work, and difficulty concentrating (13,14). In our study, the total PSQI for those on the night shift and those working more than 45 hours per week indicates is high that keeping watch and overworking reduces their sleep quality. In addition, it is thought that those on the night shift and those working more than 45 hours per week, experience daytime dysfunction, and this is due to poor sleep quality in general.

Table 3. Correlations of the Participants Characteristics with Pittsburgh Sleep Quality Index Scores

| Correlation Matrix | | Age | Hospital | Departments | Working Time | Night shift | Night shift hour/mount | Bedtime /minutes | PSQI |
|------------------------|-------------|--------|----------|-------------|--------------|-------------|------------------------|------------------|------|
| Age | Pearson's r | — | | | | | | | |
| | p-value | — | | | | | | | |
| Hospital | Pearson's r | 0.217 | — | | | | | | |
| | p-value | 0.002 | — | | | | | | |
| Departments | Pearson's r | -0.110 | 0.024 | — | | | | | |
| | p-value | 0.111 | 0.729 | — | | | | | |
| Working Time | Pearson's r | 0.068 | 0.292 | -0.082 | — | | | | |
| | p-value | 0.325 | < .001 | 0.237 | — | | | | |
| Night shift | Pearson's r | 0.288 | 0.157 | 0.040 | -0.061 | — | | | |
| | p-value | < .001 | 0.023 | 0.562 | 0.383 | — | | | |
| Night shift hour/mount | Pearson's r | -0.396 | -0.117 | -0.016 | 0.144 | -0.782 | — | | |
| | p-value | < .001 | 0.091 | 0.813 | 0.037 | < .001 | — | | |
| Bedtime/minutes | Pearson's r | -0.042 | -0.064 | 0.060 | -0.288 | 0.024 | -0.095 | — | |
| | p-value | 0.543 | 0.357 | 0.383 | < .001 | 0.727 | 0.169 | — | |
| PSQI | Pearson's r | -0.054 | 0.032 | -0.037 | 0.254 | -0.185 | 0.217 | -0.126 | — |
| | p-value | 0.440 | 0.641 | 0.589 | < .001 | 0.007 | 0.002 | 0.068 | — |

It has been said that falling asleep between 16 to 30 minutes in all age groups shows good sleep quality, which is an objective assessment (15-17). Although the participants included in

the study were found to have an average of 20 minutes to fall asleep, the fact that the total PSQI score was above 5 suggests that falling

asleep alone was not enough to indicate good or bad sleep quality.

In adults, seven hours or more of sleep per day is adequate for physiological needs (18). The fact that the average sleep time of the study participants was less than seven hours shows that it contributed to poor sleep quality.

There is a two-sided interaction between working conditions and sleep. Just as sleep has positive and negative effects on work performance, working conditions also have positive or negative effects on sleep quality (8,10). The fact that there is no difference between the sleep quality of the anesthesiologists working in different hospitals and different departments participating in our study gives the impression that the poor sleep quality, in general, is due to the work done. However, this effect is difficult to demonstrate by this study alone.

CONCLUSION

As a result, anesthesiologists have poor sleep quality, and this leads to daytime dysfunction. In general, it is thought that the reason for poor sleep quality is that their duties and responsibilities, working environment, and working conditions have negative effects on sleep quality.

Ethics Committee Approval: Ethics committee approval was received for this study from local ethics committee at Ordu University with file number 2018-96

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