Evaluation of the sleep pattern in Nursing professionals working night shifts at the Intensive Care Units
Avaliação do padrão de sono dos profissionais de Enfermagem dos plantões noturnos em Unidades de Terapia Intensiva
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ABSTRACT
Objective: This study aimed to assess the quality of sleep and verify the presence of excessive daytime somnolence in Nursing professionals working night shifts at the Intensive Care Units of the Central Institute of Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo. Methods: Seventy-five Nursing professionals were evaluated: 33% were registered nurses and 66% were licensed practical nurses; 81% of the participants were females. The age ranged from 22 to 60 years, with a mean age of 38 years. The instruments used were the Pittsburgh Sleep Quality Index and Epworth Sleepiness Scale. Results: This study showed that 97.3% of professionals have a poor quality of sleep and 70.67% have an excessive daytime sleepiness. Conclusions: In view of this, some interventions are necessary, such as the planning of a comfortable room with television, radio and appropriate beds; a routine rotation of hours per employee for resting and meals; changing of the night-time workload by reducing the shift from 12 hours to eight hours and having 15-minute breaks every two hours.

Keywords: Nursing, team; Quality of life; Night work; Sleep disorders; Intensive care units; Stress, psychological

INTRODUCTION
Due to the increasing economic and demographic changes, as well as to technological processes, there is an increasing need of a 24-hour x seven-day week society that relies on a large number of professionals working uninterruptedly at night¹.

Hospital work presents one of the most complex organizations of the modern society and it is characterized by an extremely accurate work division, as well as a refined range of technical abilities².

In this sense, the oldest groups of professionals who work in shifts, such as registered nurses (RN) and licensed practical nurses (LPN), suffer a higher...
impact of psychosocial factors of the shift work, which interfere in the health-disease processes\(^1\,3\)\(^4\). Working conditions and organization have a significant influence on tolerance in the night shifts\(^1\,3\)\(^3\).

The reflexes of socioeconomic requirements of the night shift work inserted in the relations of production are present in the family life of individuals tending to modify and change the ties, the social relationships and family structures\(^5\). This is confirmed by another similar study about the perception of the effects of shift work on the health and social life of Nursing professionals at a university hospital in the state of São Paulo, in which the most cited effect of shift work is the interference in the individual-family relationship, followed by restricted social activities and difficulty in planning life\(^6\).

The work schedules at hospitals and home care assistance are generally organized in continuous, fixed night shifts or rotation shifts of eight or 12 hours. Nowadays, the work schedule most commonly used for the Nursing staff in Brazil is the 12-hour work shift (day or night) followed by a 36-hour rest\(^3\,7\). As a result, the number of consecutive work shifts, the duration of each shift, the start and end times of the several shifts, the regularity of the work schedules, flexibility of the shift system, the part-time or full shifts, and the distribution of free time may lead these professionals to present abnormalities in their usual sleep patterns, in the physiological and cognitive functions that are expressed in a rhythmic manner\(^4\,7\)\(^8\).

When a person who works at night tries to sleep during the day, a change in the internal structure of sleep occurs. The normal sleep is the night-time sleep, characterized by an internal structure with different levels of depth, its own duration and a relative stability in terms of time to go to bed and wake up, especially when free of social and work pressures\(^9\,10\). It can be defined as a state of quietness accompanied by a posture of rest, in which there is a decrease in the capacity to respond to external stimuli\(^9\).

Therefore, the great challenge for night shift workers is, without doubt, to adapt their pace of life to biological principles and to social life\(^11\), because the discouragement associated with tiredness leads to the disappearance of interest in social life and leisure. Additionally, due to the constant and/or disturbing noises, such as in the Intensive Care Units, it also causes an intense form of irritability to voices and to domestic noise\(^12\).

This mode of work associated to stress and its relations with other factors of work organization causes professionals to fall ill\(^13\)\(^14\). Consequently, the workers may present insomnia and/or excessive daytime sleepiness, which are related to shorter periods of sleep and to difficulty in falling asleep during the day, respectively\(^3\,7\)\(^-\)8\,15\)\(^-\)16. Additionally, other frequent feelings include malaise, fatigue, humor fluctuations, decreased performance due to attention and concentration deficit and also gastrointestinal and cardiovascular disorders\(^7\,15\). This corroborates the studies indicating that 10% of night shift workers or those working in alternate shifts, who fight against sleep and force wakefulness to carry out their functions, may present transient sleep disorders\(^17\)\(^-\)19.

Additionally, a reduction in the total sleep time after a night shift leads to decreased efficiency, such as decreased alert perception after the sixth and tenth hours of continuous work and, consequently, to episodes of somnolence\(^13\).

The difficulties in adjustment associated with the night shift work arise due to the interaction of factors of the biological circadian cycle, domestic factors and social factors\(^14\,16\) and also, when this shift does not allow enough time for rest, night-afternoon-morning rotations, weekly rotations and other variants of shift rotations\(^7\). These corroborate a study carried out among Nursing care workers on a permanent shift, in which it was evidenced that the existence of a scheduled time for rest at work, evening sleep patterns, good humor and calmness while facing problems contribute to the person’s adjustment to the lifestyle imposed by the nightshift work\(^17\).

Considering that the night-time work process may cause physiological, social and adaptive problems to Nursing professionals and that this may contribute to situations of imprudence and negligence with an impact both on the worked shift and on the post-shift period, the author took an interest on studying this subject. There was also a concern about Intensive Care Unit nurses and LPNs presenting excessive daytime sleepiness after shifts and poor quality of sleep. Therefore, this current study shows great relevance and it collaborates to organizational changes that may lead to improved services rendered by the institution.

The evaluation of the sleep pattern in Nursing professionals working nightshifts at the Intensive Care Units (ICUs) is necessary, since these units provide assistance to clinical, surgical and/or trauma patients who require continuous quality and vigilance from the professionals involved in the process of caring.

**OBJECTIVES**

**General objective**

To check the quality of sleep of Nursing professionals working in night shifts at the ICUs of the Central
Institute of Hospital das Clínicas (HC) da Faculdade de Medicina da Universidade de São Paulo (FMUSP), assessed by means of the Epworth Sleepiness Scale (ESS) and the Pittsburgh Sleep Quality Index (PSQI).

Specific objectives
- To assess the quality of sleep in nurses and LPNs working night shifts at the ICUs of the ICHC/FMUSP.
- To check the presence of daytime sleepiness among nurses and LPNs working night shifts at the ICUs of the Central Institute of HC/FMUSP.

METHODS
Type of study
This is a cross-sectional study characterized for having a quantitative and descriptive exploratory approach\(^{(20-21)}\). For being exploratory, the study provides more familiarity with the problem and is able to make it more explicit or to make a hypothesis, improving the ideas or the finding of institutions and being flexible in such a way that it allows considering several aspects studied. And for being descriptive, it establishes the population features by using standardized techniques for data collection, such as a questionnaire and systematic observation\(^{(20)}\).

Setting
The study was carried out involving Nursing care professionals working night shifts at the following ICUs at HC (acronyms and abbreviations in Portuguese):
- 4\(^{th}\) floor ICU of Infectious Diseases (UMN);
- 4\(^{th}\) floor ICU of Burn Patients (UQUE);
- 4\(^{th}\) floor ICU of the Surgical Emergency Room (UPSMC);
- 4\(^{th}\) floor ICU of the Medical Emergency Room (UPSM);
- 5\(^{th}\) floor ICU of Neurology (UNEU);
- 6\(^{th}\) floor ICU of Pneumology (U2MP);
- 6\(^{th}\) floor ICU of Medical Clinic (UPSM);
- 7\(^{th}\) floor ICU of Nephrology (U1MR);
- 9\(^{th}\) floor ICU - General and Liver (U1CH).

The PSQI\(^{(22)}\) and ESS\(^{(23)}\) were applied to all the study participants.

Subjects
A total of 75 Nursing care professionals working night shifts at the ICUs were assessed; in that, 14 were men and 61 women, mean age of 38 years and standard deviation of 9.242. This corresponded to 55\% of employees in September.

Inclusion criteria
The inclusion criteria were: to be formally employed at Central Institute of HC/FMUSP; to belong to the Nursing staff (registered nurse, licensed practical nurse and/or nurse technician); to work in night-time shifts at the Intensive Care Units; and to sign the informed consent form.

Procedures
Data collection and ethical aspects
The data collection procedures included the request for research authorization at the institution where the data collection was carried out. After that, the Researcher Commitment Term was signed. Then, the Nursing care professionals working night shifts at the ICUs were invited to participate in the study. They received explanations about the investigation, signed the Informed Consent Form and went on to the next stage, which consisted of answering the PSQI and the ESS.

The questionnaires were always handed out at 10 p.m. during the night shifts at the ICUs and collected at the end of the shifts at 7 a.m., in order to not interfere in the routine activities at the units. Data collection was carried out in September, 2007.

Instruments
The instruments used for the data collection were:
- PSQI: already validated and translated into Portuguese, was used with the purpose of assessing the subjective quality of sleep, the sleep habits related to quality and the occurrence of sleep disorders. The instrument comprises seven components: subjective quality, latency, duration, efficiency and sleep disorders, use of sleeping pills and daytime sleepiness which result in a score corresponding to the overall subjective quality of sleep. The global score is determined by adding up the seven components; each component receives a score between 0 and 3 with the same weight, in which 3 reflects the negative extremity of the Likert-type scale. The scale ranges from 0 to 21 scores, in which scores up to 5, inclusive, indicate good quality of sleep and scores higher than 5 indicate a poor quality of sleep\(^{(22)}\);
- ESS: it was used to assess the likelihood that individuals will fall asleep during the day in eight monotonous situations of daily life, thus identifying
the excessive daytime sleepiness. The degree of sleepiness corresponds to the sum of the scores assigned to each question and ranges from 0 to 24. It is considered pathological if higher than 9, and a value of 10 is used as a normality divisor in the ESS \(^{(23)}\).

**Statistical treatment of data**

The results were analyzed by means of descriptive statistics (mean, standard deviation, median and percentages), with use of the software Excel 2003 XP and statistical program named Minitab.

**RESULTS**

A total of 120 questionnaires were distributed to Nursing care professionals working night shifts at the ICUs of HC, and 75 questionnaires were answered and returned. The questionnaires were always handed out at 10 p.m. during the night shifts at the ICUs and collected at the end of the shifts at 7 a.m., in order to not interfere in the routine activities at the units.

**Sociodemographic characteristics**

In the group composed of 75 Nursing professionals, 33% were RNs, 66% were LPNs and 81% females. The age ranged from 22 to 60 years (mean age of 38 years, standard deviation of nine years; median of 37 years). As to ethnicity, 52% were Caucasians, 26.7% Black, 20% mulattos and 1.3% Asian descendant. Regarding how long they had been working night shift ranged from one to 11 months (10.6%); from one to ten years (58.6%); from 11 to 20 years (20%); for over 20 years (5.3%), and 5.3% of participants did not answer. Participants who worked at another institution accounted for 28% (nurses, 12% and LPNs, 16%), as seen in Table 1.

**Assessment of sleep pattern**

Using the PSQI and considering the score ranging from 5 to 21, in the group of 25 RNs (Table 2) and 50 LPNs (Table 3), 100 and 88%, respectively, presented poor quality of sleep.

As to the ESS, taking into account a score ≥ 10, in the group of 25 RNs (Table 4) and 50 LPNs (Table 5), 72 and 70%, respectively, presented EDS.

Considering the group of 75 Nursing professionals evaluated by the PSQI and ESS, respectively, it was observed that 97.3% of individuals had a poor quality of sleep and 70.67% had EDS, as seen in Table 6.
DISCUSSION

The sociodemographic characteristics of the present study confirm what the literature shows about the predominance of the female gender, emphasizing a trend to the “feminization” of the workforce in the health segment; the only difference was related to the age group between 22 and 60 years and the mean age of 38 years; in general, the age group is between 23 and 44 years with a mean age of 34 years.

As to how long they had been working night shift, 58% had been working between one and ten years and showed similarity with another study about stress and Nursing job, in which the majority of individuals (83%) worked continuously night shift for more than one year. Those also working in another institution represented 28% (RNs 12%, and LPNs, 16%), differently from the literature in which the double working day occurs in 72% of cases.

In the group of 75 Nursing professionals assessed by the PSQI, it was observed that 92% of them scored greater than five and had a poor quality of sleep. According to categories, 100% of RNs and 88% of LPNs presented poor quality of sleep. This corroborates the study about the biological rhythm and quality of sleep in nurses, in which 100% of nurses also had poor quality of sleep. Nevertheless, this result differed from another study in which only 51.85% of Nursing professionals had a very altered sleep pattern; it should be pointed out that another instrument was used to assess quality of sleep in nurses.

In the group of 75 Nursing professionals analyzed using the ESS and working night shifts at the Intensive Care Units, taking into account a score greater or equal to ten, 70.67% of Nursing professionals presented EDS. According to categories, 25 RNs and 50 LPNs, 72% of RNs and 70% of LPNs presented EDS. Considering the professional categories, 100% of RNs and 88% of LPNs presented a poor quality of sleep. When analyzed in terms of professional categories: 100% of RNs and 88% of LPNs presented a poor quality of sleep; as to the ESS, 70.67% of Nursing professionals presented EDS. Considering the professional categories, 72% of RNs and 70% of LPNs, presented excessive daytime sleepiness. This showed the presence of excessive daytime sleepiness in the group studied.

CONCLUSIONS

In the group of 75 Nursing professionals working night shifts at the ICUs of Central Institute of HC/FMUSP it was observed that:

- 33% were RNs, 66% LPNs and 81% females. Age range was 22 to 60 years (mean age of 38 years, standard deviation of nine years, median age of 37 years);
- with the PSQI, 92% of Nursing professionals presented a poor quality of sleep. When analyzed in terms of professional categories: 100% of RNs and 88% of LPNs presented a poor quality of sleep;
- as to the ESS, 70.67% of Nursing professionals presented EDS. Considering the professional categories, 72% of RNs and 70% of LPNs, presented excessive daytime sleepiness. This showed the presence of excessive daytime sleepiness in the group studied.

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