Patient Perception of Environmental and Nursing Factors Contributing to Sleep Disturbances in a Neurosurgical Intensive Care Unit

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UĞRAS, G.A. and ÖZTEKİN, S.D. Patient Perception of Environmental and Nursing Factors Contributing to Sleep Disturbances in a Neurosurgical Intensive Care Unit. Tohoku J. Exp. Med., 2007, 212 (3), 299-308 —— Many factors may affect sleep in the neurosurgery intensive care unit (NSICU), including therapeutic and diagnostic procedures, medications, the underlying disease process, and noise generated in NSICU. This study was aimed to determine the factors and nursing interventions, which affect the patients’ sleep in NSICU, and to ascertain future descriptive research studies in nursing. The sample consisted of 84 voluntary patients hospitalized at a university hospital. They were consecutively asked to fill out a questionnaire in face-to-face interviews, and on the same day they were transferred out of the NSICU to a neurosurgical ward. Sixty-six patients (78.6%) experienced sleep disturbances. In those patients, being kept immobile (63.6%) and being in a noisy environment (57.6%) were the factors, which most frequently disturbed sleep. Likewise, the nursing interventions were found to have profound influences on patients’ sleep; namely, being asked to move an arm/leg or to keep them in the same position for neurological diagnostic reasons (43.9%), and being asked questions to determine the level of consciousness (40.9%) were identified as the common sleep disturbance factors. In conclusion, immobility, environmental noise factors, and the disturbances from implementing the nursing interventions should not be ignored. Sleep disturbance in NSICU should be addressed on the multidisciplinary care plan and in health team conference, and care should be planned to assure good quality of patients’ sleep. ——— sleep; neurosurgery; intensive care unit

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Intensive care units (ICUs) have complex biomedical equipments for continuous monitoring of patients, who have serious physical conditions, to support their vital functions, and are used by health professionals and nurses to give specialized treatment and care (Demir and Dramalı 2002; Öztekin and Akyolcu 2003). The patients in ICUs commonly experience sleep disturbances and state that these problems continue throughout their stay in the ICU (Freedman et al. 1999). Changes in

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normal sleep and rest activities can be related to the critical care environment of the ICU or the critical nature of an illness, and also to the nursing interventions and effect of medications (Fontaine 1998; Bourne and Mills 2004; Tracy 2006). In the ICU patients who have difficulty in falling asleep, they have less rapid eye movement (REM) sleep, waken more frequently than normal, and may be wakened from sleep by noise, anxiety, pain, frequent treatments and nursing care interventions, and from the monitors (Bucher 2004; Parthasarathy and Tobin 2004; Tracy 2006). In addition to these, ventilator dysynchrony is another factor causing sleep disturbances (Bosma et al. 2007).

Although there are many studies (Krachman et al. 1995; Freedman et al. 1999; Calvete et al. 2000; Freedman et al. 2001; Olson et al. 2001; Bohrer et al. 2002; Gabor et al. 2003; Frisk and Nordstrom 2003; Richardson 2003; Parthasarathy and Tobin 2004) reported in the literature studying sleep issue in ICUs, there is only one study capturing the factors that affect sleep in the neuro-surgery intensive care unit (NSICU) (Monsén and Edell-Gustafsson 2005). In their study, only eight general and ten specific nursing care interventions were investigated. However, in our study we intended to investigate three nursing interventions required for neurological assessment in addition to eighteen general and specific nursing care interventions. This study will ascertain the problems for future nursing research.

This study was conducted for the purpose of defining the factors and nursing interventions that affect patients’ sleep in NSICU. The research questions are listed below:

1- Do patients in NSICU have problems in sleep activities?
2- What are the factors that affect patients’ sleep in NSICU?
3- What are the nursing interventions that affect patients’ sleep in NSICU?

**METHODS**

**Sample and setting**

This research was planned as a descriptive study for the purpose of determining factors that affected the sleep of 84 patients admitted to NSICU at a university hospital in Istanbul between December 2005 and April 2006.

At the beginning, totally 126 patients were reached, but 21 of the patients were not between 18-65 years old, 5 were exitus, 4 were transferred to another service or ICU, 9 did not have clear communication, 1 was discharged home from the NSICU, 1 patient did not know Turkish and could not complete the questionnaire, and 1 patient did not agree to participate in the study. Excluding all these 42 cases, mentioned, the rest, 84 patients comprised the study sample.

The patients were included consecutively in the study in accordance with the following criteria: The patients had been treated in NSICU at least one night, had been administered non-opioid analgesics routinely such as tenoxicam (tilcotil 40 mg/day, oksamen-L 40 mg/day; i.v.), lornoxicam (xefo 16 mg/day; i.v.) and, pethidine-hydrochloride (aldolan 30 mg/day i.m.) when they are required for the patients’ care. Besides, the patients were between 18-65 years old, conscious and oriented in space and time, able to fill in a short self-report questionnaire assessing their sleep, and able to use their judges to answer the questions included in the questionnaire, including the open-ended questions.

The exclusion criteria were the patients taking a tranquilizing medication, morphine, opiates, benzodiazepine, the patients who have impaired cognition owing to the effects of the medication, sensory over- or under stimulation (inability to judge and insight, comprehend) or who did not have consciousness, the patients who were confused or too tired to answer any questions, the patients with a history of sleep disorder, or the patients taking hypnotic or sedative to regulate their sleep during their first night in NSICU and throughout their stay in NSICU, the patients with conditions that may be associated with sleep-related respiratory insufficiency such as neurological and neuromuscular disorders (such as polio and muscular dystrophy) leading to hypoxemia and hypercapnia, and last the patients with endotracheal entubation during their stay in NSICU.

The questionnaires were completed in face-to-face interviews with patients who had been transferred out of the seven-bed NSICU to the general neurosurgery wards on the same day of their transfer. The NSICU, where the patients had been, has seven beds and is an open type of unit. The unit has a nurse station with a telephone. Monitors for continuous patient monitoring are available at the head of every bed. The nurses have the opportunity to physically monitor all of the patients. The patients’
friends and family are limited to visiting hours to enter the unit.

**Questionnaire**

A questionnaire was developed by the researchers based on information in related literature (Goodemote 1991; Fontaine 1998; Puntillo and Casella 1998; Urban 1998; Freedman et al. 1999; Olson et al. 2001; Lusk and Lash 2005; Stockert 2005) and has 9 questions in two sections.

In Section One, there are four questions directed at determining the patients’ descriptive characteristics. Questions were asked for this purpose about the patients’ gender, age, diagnosis schedule, reason for being admitted to the NSICU and length of hospitalization (days).

In Section Two, there are five questions and subgroup questions directed at these topics to determine the presence of patients’ sleep problems and factors that affect their sleep. Questions were asked for this purpose to determine the presence of problem sleeping in the NSICU, factors that affected their sleep in the NSICU, environmental factors, factors that caused noise, and the effect of nursing interventions on patients’ sleep.

**Data collection**

A pilot study with 10 patients was conducted before beginning the study. The patients were given the questionnaire and they evaluated whether or not the questions were understandable and appropriate for the purpose of the study. Patients, in the sample study, who were transferred out of the seven-bed NSICU to the general neurosurgery wards were given the questionnaire in face-to-face interviews on the same day of their transfer. The primary researcher explained all questions that seemed difficult to understand or interpret for the patients.

**Ethical perspectives**

Before starting the study, in the context of an ethical and humans rights perspective the required permissions were obtained from the Istanbul University Medical Faculty Hospital Ethics Committee, the Academics Committee and the Faculty Management Committee. Before the patients were given the questionnaire their verbal permission, they had been asked to confirm their informed consents for voluntary participation in the study. The patients were informed that all information written on the questionnaire would be stored confidentially by the researcher and that it would only be used for scientific purposes.

**Statistical analysis**

Data obtained in the study were evaluated using Statistical Package for Social Sciences (SPSS, Chicago, IL, USA) for Windows 10.0 program and MS Excel 2003. Descriptive statistics (frequency of categorical values, numerical values, mean and standard deviation) were used in the evaluation of data at a 95% confidence interval (Senocak 1998).

**RESULTS**

This study included the patients \( n = 84 \) in NSICU, who had undergone neurosurgery or neurologic diseases. Most of the patients (96.4%, \( n = 81 \)) were admitted to the NSICU for postoperative monitoring. The length of stay in the NSICU was in the range of 1-24 days with a mean of 2.83 (min: 1; max: 6.77) days. The average age (\( n = 84 \)) was 46.57. The majority of the patients (29.8%, \( n = 25 \)) were in the range of 38-47 years old, and 53.6% of the patients (\( n = 45 \)) were male.

The most common reason expressed by the patients who had sleep problems was the necessity for being kept immobilized (63.6%, \( n = 42 \)). In addition to the immobility the other reasons could be stated respectively as follows: The patients had to avoid immediate moves in order to keep the attached positions of equipments and catheters, were not allowed to stand up in the post/pro-operative periods for the necessity of bed-rest, had pain at the surgical and catheter entry sites (related to changing dressing by physician/nurses or during insertion of catheter), (59.1%, \( n = 39 \)), had to be attached to more than one device, had concerns about the results of surgery (both at 56.1%, \( n = 37 \)), had a headache, could not see friends/relatives (both at 54.5%, \( n = 36 \)), had to stay in a strange environment, had anxiety about changes in work status after surgery, and felt fear of being disabled (all three at 51.5%, \( n = 34 \)) (Table 1).

Of the 66 patients who did experience sleep problems, 57.6% identified the noisy environment as the environmental factor that affected their sleep (\( n = 38 \)) (Fig. 1).

During their stay in the NSICU 66.7% (\( n = 44 \)) of the patients who experienced sleep problems were bothered by environmental factors that
made noises, such as the monitor, ventilator, oxygen probe and intravenous (IV) pump alarm, identified the alarm sounds as having an effect on their sleep (Fig. 2).

The distribution of nursing interventions that affected the sleep of patients who experienced sleep problems during their stay in the NSICU (n = 66) were examined (Table 2).

43.9% of the patients with sleep problems (n = 29) stated that their sleep was affected by being asked to raise their arm or leg /keep in the same position/push/pull, 40.9% (n = 27) being asked questions to assess their level of consciousness and having light shone in their eyes to check pupillary response (39.4%, n = 26) (Table 2).

**DISCUSSION**

More than two-third of the patients in the sample (78.6%, n = 66) experienced problems in their sleep activities while in the NSICU in the present study. Sleep problems in ICU patients are very common (Goodemote 1991; Krachman et al. 1995; Fontaine 1998; Puntillo and Casella 1998; Urban 1998; Freedman et al. 1999; Redeker 2000;

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**TABLE 1. Distribution of factors affecting sleep by patients experiencing sleep problems in the NSICU** (n = 66).

<table>
<thead>
<tr>
<th>Factors in groups</th>
<th>Factors affecting sleep</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immobility</td>
<td>Being kept immobile</td>
<td>42</td>
<td>63.6</td>
</tr>
<tr>
<td></td>
<td>Being attached to more than one device</td>
<td>37</td>
<td>56.1</td>
</tr>
<tr>
<td>Pain</td>
<td>Feeling pain at the surgical and catheter entry sites (related to changing dressing by physician/nurse or during insertion of catheter)</td>
<td>39</td>
<td>59.1</td>
</tr>
<tr>
<td></td>
<td>Having a headache</td>
<td>36</td>
<td>54.5</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Being anxious about the results of surgery</td>
<td>37</td>
<td>56.1</td>
</tr>
<tr>
<td></td>
<td>Only seeing friends/family members for a short period of time</td>
<td>36</td>
<td>54.4</td>
</tr>
<tr>
<td></td>
<td>Being in a strange environment</td>
<td>34</td>
<td>51.5</td>
</tr>
<tr>
<td></td>
<td>Being worried about changes in work status after surgery</td>
<td>34</td>
<td>51.5</td>
</tr>
<tr>
<td></td>
<td>Fear of being disabled</td>
<td>34</td>
<td>51.5</td>
</tr>
<tr>
<td></td>
<td>Being able to see other patients</td>
<td>32</td>
<td>48.5</td>
</tr>
<tr>
<td></td>
<td>Fear of losing control</td>
<td>31</td>
<td>47.0</td>
</tr>
<tr>
<td></td>
<td>Being naked</td>
<td>30</td>
<td>45.5</td>
</tr>
<tr>
<td></td>
<td>Feeling lonely</td>
<td>27</td>
<td>40.9</td>
</tr>
<tr>
<td></td>
<td>Being together with strangers</td>
<td>23</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>Concern about transfer from the NSICU to the ward</td>
<td>18</td>
<td>27.3</td>
</tr>
<tr>
<td>Comfort</td>
<td>Feeling nausea-vomiting</td>
<td>24</td>
<td>36.4</td>
</tr>
<tr>
<td></td>
<td>Feeling hungry</td>
<td>23</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>Having the feeling of constantly being under observation</td>
<td>21</td>
<td>31.8</td>
</tr>
<tr>
<td></td>
<td>Feeling the need to go to the toilet</td>
<td>20</td>
<td>30.3</td>
</tr>
<tr>
<td></td>
<td>Being uncomfortable from diagnostic tests (chest x-Ray, CT, MR)</td>
<td>18</td>
<td>27.3</td>
</tr>
<tr>
<td></td>
<td>Uncomfortable from the bed and pillow</td>
<td>15</td>
<td>22.7</td>
</tr>
</tbody>
</table>

*More than one factor could be chosen in answer to the question to determine factors affecting sleep in the NSICU.
Freedman et al. 2001; Olson et al. 2001; Frisk and Nordstrom 2003; Parthasarathy and Tobin 2004; Lusk and Lash 2005; Peruzzi 2005; Stockert 2005). In a study by Bohrer et al. (2002) to determine problems experienced by surgical patients in an ICU, 67% of the patients were unable to sleep in their regular schedule. In a study by Sekmen and Hatipoğlu (1999) on the effect of the ICU technologic environment on patients, 77.8% of the patients experienced difficulty in sleeping. In studies conducted by DeKeyser (2003), So and Chan (2004), and Hweidi (2005), there was a widespread problem of patients sleeping in the ICU environment which was a stress-producing...
situation. Our results do not show any contradictions to these previous studies.

It has been observed that the lack of movement increases discomfort in critical care patients, as patients are unable to get in an appropriate position (Halm and Alpen 1993; Fontaine 1998; Simini 1999; Bucher 2004). The findings in studies conducted by Sekmen and Hatipoğlu (1999), Simini (1999), Bohrer et al. (2002) and So and Chan (2004), which ICU patients’ inability to move causes them discomfort, support our findings (Table 1).

Pain is one of the significant factors negatively affecting sleep and disturbing the normal sleep and wakefulness cycle (Dracup and Bryan-Brown 1995; Krachman et al. 1995; Bucher 2004). Wong and Arthur (2000) reported that patients in the surgical ICU in the early postoperative period not only complained of pain at the wound site, but also stated that they had back pain, and wanted to be given a massage before sleep and pillows to help with positioning. The results of studies by Simini (1999), Novaes et al. (1999), and Hweidi (2005) showing that ICU patients have a widespread experience of pain are consistent with the data obtained in our study as shown in Table 1.

More than half of the patients with sleep problems stated that their sleep was affected from their concerns over the results of surgery (Table 1). It has been reported in the literature that serious injury, having an illness and the process of sur-

<table>
<thead>
<tr>
<th>Nursing interventions</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being asked to raise their arm or leg, keep it in the same position, pull or push</td>
<td>29</td>
<td>43.9</td>
</tr>
<tr>
<td>Having questions asked to assess their level of consciousness</td>
<td>27</td>
<td>40.9</td>
</tr>
<tr>
<td>Checking their pupils with a light</td>
<td>26</td>
<td>39.4</td>
</tr>
<tr>
<td>Mouth care being given</td>
<td>26</td>
<td>39.4</td>
</tr>
<tr>
<td>Doing treatments during nighttime hours</td>
<td>21</td>
<td>31.8</td>
</tr>
<tr>
<td>Giving catheter care</td>
<td>20</td>
<td>30.3</td>
</tr>
<tr>
<td>Taking blood samples</td>
<td>19</td>
<td>28.8</td>
</tr>
<tr>
<td>Changing the bed linen</td>
<td>19</td>
<td>28.8</td>
</tr>
<tr>
<td>Giving eye care</td>
<td>19</td>
<td>28.8</td>
</tr>
<tr>
<td>Giving a bed bath</td>
<td>16</td>
<td>24.2</td>
</tr>
<tr>
<td>Emptying the urinary drainage bag every hour</td>
<td>14</td>
<td>21.2</td>
</tr>
<tr>
<td>Taking their blood pressure</td>
<td>12</td>
<td>18.2</td>
</tr>
<tr>
<td>Taking blood sample from the fingertip to check blood glucose</td>
<td>12</td>
<td>18.2</td>
</tr>
<tr>
<td>Changing wound dressings</td>
<td>12</td>
<td>18.2</td>
</tr>
<tr>
<td>Starting or changing IV catheter</td>
<td>11</td>
<td>16.7</td>
</tr>
<tr>
<td>Putting on pressure stockings</td>
<td>10</td>
<td>15.2</td>
</tr>
<tr>
<td>Measuring CVP</td>
<td>9</td>
<td>13.6</td>
</tr>
<tr>
<td>Checking body temperature</td>
<td>7</td>
<td>10.6</td>
</tr>
<tr>
<td>Applying cold when body temperature is elevated</td>
<td>6</td>
<td>9.1</td>
</tr>
<tr>
<td>Checking electrodes for ECG monitoring</td>
<td>6</td>
<td>9.1</td>
</tr>
<tr>
<td>Giving hair care</td>
<td>5</td>
<td>7.6</td>
</tr>
</tbody>
</table>

*More than one factor could be chosen in answer to the question to determine nursing interventions given to patients to determine their effect on sleep in the NSICU. The patients were asked to mark nursing interventions that were done to them.*
surgery can lead to the development of fears in patients about having cancer, being handicapped, loss of work and family support, and being unable to be sufficient for themselves and their families (Urban 1998). In the study by Wong and Arthur (2000) which supports our study, surgical ICU patients in the early postoperative period commonly experienced anxiety and fear. The causes for this fear and anxiety include fear of illness, the result of surgery, the illness process, poor recovery and the unknown.

In the group of patients stating sleep problems, the number of patients who were complaining about a headache and having only a short period of time to see their friends/relatives (Table 1) was more than half. The reason why headache is one of the primary causes affecting sleep with more than half of the patients complaining of it, may be related to the common development of headache in the preoperative and postoperative period in the NSICU. The high percentage obtained from our study emphasizes the importance of ensuring the support of patients’ families and friends. In this context, the patient and family need to be seen as a whole. In the studies by Sekmen and Hatipoğlu (1999), So and Chan (2004), and Hweidi (2005), which supported our study, it was reported that family members/friends only getting a short period of time to see patients was a situation that created stress in the patients. As shown in Table 1 more than half of the patients with sleep problems stated that their sleep was affected by being in a strange environment (Table 1). In the literature it has been reported that being in a strange environment is the primary cause of anxiety and stress in ICU patients (Çınar and Khorshid 2003; Bucher 2004). In the study by Wong and Arthur (2000) it was found that surgical ICU patients experience fear and anxiety in the early postoperative period from being in the same place as other patients and from being in a strange environment. In the studies by So and Chan (2004) and Hweidi (2005) it was determined that situations that cause stress in the ICU are male and female patients being in the same room, lack of privacy and presence of noise. The results of this study are in agreement with the previous ones.

The number of patients whose sleep was affected by concern over changes in their work situation after surgery (Table 1) was exceeding half of the sample. In the study by Mammi et al. (2006) it was determined that only 38% of patients have returned to work within a four year period of time following traumatic brain injury. In a study by Herno et al. (1996) that examined the status of patients’ returning to work following lumbar spinal stenosis surgery it was determined that 37% of the women and 41% of the men returned to work.

Being in a noisy environment was one of the environmental factors that affected the sleep of 57.6% of the patients in the NSICU (Fig. 1). Our study shows similarity with other studies (Freedman et al. 1999; Olson et al. 2001; Walder et al. 2001; Monsén and Edell-Gustafsson 2005) that have been conducted on the effect of noise on sleep.

The environmental factors creating noise affected our patients’ sleep (Fig. 2). In a study by Calvete et al. (2000) that examined the sleep of patients in the ICU and factors that affect sleep, it was reported that the alarm sounds were the most disturbing of the environmental factors. The result of this study is consistent with our study. Also in this perspective, the results gained from this study show a concrete agreement with the previous ones by Sekmen and Hatipoğlu (1999), So and Chan (2004), Hweidi (2005), and Calvete et al. (2000).

A small number of patients in our study stated those voices, sounds from other patients (moaning, etc.), the sound of the oxygen masks, sounds from radio, and rings of the doorbell and the telephone affected their sleep (Fig. 2). Again there is no conflict with the other studies by Frisk and Nordstrom (2003), So and Chan (2004), and Hweidi (2005).

The patients in the ICU have to be woken up frequently by health care professionals for assessment and treatment activities and these situations cause problems with their sleep (Krachman et al. 1995; Fontaine 1998; Thelan et al. 1998; Gabor et al. 2001; Tamburri et al. 2004). There is an
additional intervention, neurologic assessment in NSICU to the other nursing interventions implemented in th general ICU. For this reason, the number of nursing interventions in NSICU is higher than in ICU. This situation may imply the presence of quantitatively excessive nursing interventions in NSICU and contribute to experiencing problems in sleep cycle.

As seen in Table 2, the number of patients, who had sleep disturbances because of being asked to raise their arm or leg, keep it in the same position, pull or push in neurologic assessment, being asked to answer the questions to determine their level of consciousness, and having a light shone in their eyes to check their pupils, is high enough not to be ignored. In a study by Monsèn and Edèll-Gustafsson (2005) the most annoying nursing intervention was found to be assessing patients’ level of consciousness. This result is consistent with the results obtained in our study. In our study it was determined that the most common nursing intervention affecting sleep was being imposed on neurological assessment every one to two hours during the night. This does not allow patients to sleep deeply or wakes up patients. During the face-to-face interview the patients compared the number and the periods of neurological assessments done in NSICU with the regular nursing interventions. Then they stated that in the regular services neurological assessments were rare and done most in the daytime/morning and in the evening, that was why they were woken up frequently and slept more deeply.

In the literature, the Glasgow Coma Scale (GCS) has become a cornerstone in the neurological/surgical assessment used on patients by both nursing and medical staffs (Ellis and Cavanagh 1992). It has been reported that 10% of patients are wakened by nursing interventions (Parthasarathy and Tobin 2004).

**Limitations**

There are several limitations in our study. The first is that we did not evaluate sleep with a clinical sleep study (polysomnographic) that would have provided objective evaluation; we only evaluated the patients’ answers subjectively. For this reason the results are subjective.

The second is that the questionnaires were filled out after patients had been transferred out of the ICU to the ward. However it should be kept in mind that patients may not be able to remember what they experienced while they were in the ICU.

The third is that this study was only conducted at one hospital with a limited number of neurosurgical intensive care patients. For this reason it cannot be generalized to all ICU patients.

The fourth is that comparisons were not made between factors that affected sleep. There is an information gap about which factors had more negative effect on the neurosurgery patients and why.

The last one is that we did not define delirium although neurosurgical patients are usually under the high risk of developing delirium at some stage during their NSICU stay. Indeed this may also affect the patients’ memory and perception and, therefore the reliability in reporting their experiences.

**Conclusion**

The majority of the patients in NSICU experienced a problem with sleep and those who did have a problem with sleep identified being kept immobile, being attached to more than one device, having pain, and anxious about the results of surgery, seeing friends/family members only for a short period of time, staying in a strange environment, having concerns about changes in work status after surgery and feeling fear of being disabled as causes for their problems with sleep.

Interventions for neurological assessment used both nursing and medical staff did not have negative impacts on patients’ sleep as much as other factors, such as noise and being immobilized, however the parts of neurological assessment such as asking the patient to raise a leg or arm, to keep it in the same position, to push or pull, to answer questions in order to evaluate level of consciousness and, checking their eye pupils with a light shone affected sleep at a level that cannot be ignored.
It is recommended that patients be informed about the purpose for catheters and cannulas, that noise be controlled from voices and activities by the effective physical equipping and planning of units, that alarm sounds be turned down to the lowest level possible for the health care professionals to be able to hear, that instead of sound alarms, light alarms be used on monitors, that neurological assessments, except in emergency situations, be decreased as much as possible so that patients can remain undisturbed for 90-120 min, that when patients’ general condition is stable, nursing interventions be conducted while the patients are awake.

Sleep disturbance in NSICU should be addressed on the multidisciplinary care plan and in health team conference, and nursing care planned accordingly. The combined interventions required for neurological assessment should be evaluated for each patient by nurses, physicians, nursing and medical students in order to decrease the negative effects of the factors, mentioned above, on patients’ sleep for the future studies.

References


