

# Sleep Quality As Perceived By Critically Ill Patients At El Manial University Hospitals

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## Abstract

**Background:** Literature review cited that sleep is absolutely essential for surviving and reclamation of the quality of life. Critically ill patients often have poor sleep quality with prolonged sleep latency, sleep fragmentation, decreased sleep efficiency and frequent arousals. Nurses have a unique role for early diagnosis of sleep disorders, decreasing stressors levels and providing the necessary environmental regulations to create a therapeutic ambience. **Aim of the study:** to assess perceived sleep quality; and identify factors affecting sleep quality among adult critically ill patients At El Manial University Hospital. **Research Design:** A descriptive exploratory design was utilized. **Research questions:** a) how do adult critically ill patients perceive sleep quality in the Critical Care Department of El Manial University Hospital? b) What are the factors affecting sleep quality among adult critically ill patients at El Manial University Hospital? **Setting:** selected critical and cardiac care units at El Manial University Hospital. **Sample:** A samples of convenience consisting of 100 adult male and female patients were included in the study. Tools of data collection: **tool 1:** Socio-demographic and Medical Data Sheet, **tool 2:** Modified St Mary's Hospital Sleep Questionnaire **tool 3:** Factors Affecting Sleep Quality Questionnaire among ICU Patients **Results:** The current study revealed that 76.0% of the studied sample had lack of sleep disturbance before hospitalization. However, 84 % had sleep disturbances during ICU stay, of these more than two thirds (67 %) had moderate sleep disturbance. Presence of strange and bad odors, noise, having pain, fear of death and a loud voice produced by the ICU personnel had the most significant negative impact on patients' sleep in percentage of 52.4, 50, 61.9, 45.2, 52.4 respectively. **Conclusion:** Sleep disturbances in the ICU are multifactorial, and ICU patients' perceived degrees of sleep disturbance as a moderate. **Recommendations:** Based on findings of the present study, the following are recommended to be done by ICU nurses; create a healing ICU environment that should incorporate noise, light and temperature controls; decrease stimuli during night time hours to promote regulation of the circadian rhythm, allow usage of sleeping aids such as relaxing music, eye patches and earplugs into their daily nursing practice ; Cluster nursing activities and eliminate non-essential treatments during night time hours to allow uninterrupted sleep periods of at least 90 minutes to complete one sleep cycle , and minimize staff conversation, alarm noise and light during the quiet night time hours .

**Keywords:** Sleep quality, critically ill patients, Perception.

## Introduction

The ICU with its modern advance life supporting intrusive equipment and invasive monitoring devices present an intimidating and foreign environment to the critically ill patients and their families. Alarm noises, staff conversation, and frequent intervention related activities throughout the day and night, further exacerbate this unfavorable environment for sleep and recuperation (Duong-Coburn, 2013). Consequently, critically ill patients often have abnormal sleep with prolonged sleep latency, sleep fragmentation, decreased sleep efficiency, frequent arousals,

increased non rapid eye movement (NREM) sleep, and decreased rapid eye movement (REM) sleep (Little, et al., 2012). Lack of sleep and rest can be a factor stimulating cardiovascular attack. It increases blood pressure and heart beat. The increase in activities of sympathetic system, due to lack of sleep, causes cardiovascular attack. As well, sleep disorder can cause pain experience and there is a direct relationship between quality of sleep and pain (Moeini,et al., 2010). As recommended by Ganz , (2012) Interventions to improve sleep in the ICU include decreasing noise such as limiting the use of televisions and

telephones, keeping patients' doors closed, lowering noise levels when possible, and reminding staff and visitors to minimize the volume of their conversations, lowering light levels, minimizing the use of medications that inhibit sleep and using those that promote sleep, and allowing uninterrupted time for sleep by decreasing nursing care during the night whenever possible (e.g., minimize bathing, dressing changes at night).

## **2-Aim of the study**

The aim of this study is to assess perceived sleep quality; and identify factors affecting sleep quality among adult critically ill patients At El Manial University Hospital

## **3-Research questions**

**To fulfill the aim of this study, two research questions were formulated:**

3.1) how do adult critically ill patients perceive sleep quality in the critical care department of El Manial University Hospital?

3.2) what are the factors affecting sleep quality among adult critically ill patients at El Manial University Hospital?

## **4-Subjects and Methods**

### **4.1. Research Design:**

A descriptive exploratory design was utilized in the current study.

### **4.2. Setting:**

The current study was carried out at the critical care departments at El Manial university hospital which are affiliated to Cairo university hospitals. It consists of three units; two units are located in the first floor, they consist of three ICUs; each one consists of 4 beds, beside them there is CCU which consists of three rooms; each one contains from 3 beds; The second critical care unit is present in the second floor, it consists of ICU 14 (contains 14 bed), ICU 9 (contains 9 bed), isolation room (contains 4 beds) and shock room (contains 3

beds); while the third critical care unit is located in the third floor and contains 18 beds.

### **4.3. Sample:**

A sample of convenience consisting of 100 adult male and female patients who were, alert, able to communicate, and don't receive hypnotics or sedatives.

### **4.4. Tools:**

**Three tools for data collections were utilized; they included:**

**4.4.1 .Tool 1: Socio demographic and Medical data sheet:** This sheet includes data related to (Patient's age, sex, occupation, marital status, diagnosis, co morbidities ...etc). In addition to number of sleeping hours before and during ICU stay.

**4.4.2 .Tool 2: - Modified St Mary's Hospital Sleep Questionnaire (SMHSQ):-** This questionnaire was modified by the researcher in the light of St Mary's Hospital Sleep Questionnaire (SMHSQ) to assess sleep quality among critically ill patients (Before and during ICU stay). SMHSQ is designed for evaluating sleep status of the hospitalized patients (Nesami, et al, 2014). It was modified and translated by the investigator into Arabic language, tested and retested by a panel of three experts. It is a likert - self-reported questionnaire, consisting of four categories representing patients' answer. Each number is expressed as: 1 = never, 2 = so little effect, 3 = greater effect and 4 = too much effect. It includes fifteen items for assessing subjective sleep quality such as sleep-wake pattern, occurrence of arousals at night, naps and sleep disturbances.

**Scoring:** The lesser the scores of this tool, the better the sleep quality. 15 scores or less refer to lack of sleep disturbance, scores from 16 to 29 reflect mild sleep disturbance, score from 30 to 44 reflect average sleep disturbance, scores from 44 to 59

reflect severe sleep disturbance, and scores more than 60 reflect the highest degree of severe sleep disturbance.

**4.4.3. Tool 3: Factors Affecting Sleep quality Questionnaire among ICU Patients**—This questionnaire was developed bilingually ( English & Arabic ) by the researcher in the light of sleep questionnaire developed by Freedman et al (1999), to assess different contributing factors to sleep disturbance in the intensive care unit. It was developed, then reviewed, tested and re-tested by a panel of three experts in the field of critical care nursing. It consists of 19 items representing predisposing factors to sleep disturbance in the intensive care unit classified under four main domains: unit design and structure, patients themselves, other patients, and unit's staff and personnel.

Scoring: It is a likert scale, including four categories ranging from 1 to 4. Each number is expressed as: 1 = doesn't cause any sleep disturbance, 2 = cause mild sleep disturbance, 3 = cause moderate sleep disturbance, and 4 = cause severe sleep disturbance.

### **5-Protection of Human Rights**

An official permission to conduct the study was obtained from the vice dean for higher education and research Faculty of Nursing and directors of Intensive Care Unit at El Manial University Hospital .Written consents for patients' agreements to be included in the in study were obtained after explanation of the nature and purpose of the study. Each patient was free to either participate or not in the current study and had the right to withdraw from the study at any time without any rational. Also, patients were informed that obtained data will not be included in any further researches. Confidentiality and anonymity of each

subject were assured through coding of all data.

### **6-Procedure**

The current study was conducted through two phases: designation phase and implementation phase.

#### **6.1. Designation phase:**

it was concerned with construction and preparation of different data collection tools (sociodemographic and medical data sheet, sleep quality questionnaire and predisposing factors to sleep disturbance assessment questionnaire).This in addition to obtaining agreements to carry out the study where the investigator submitted formal requests to the directors of critical care departments, at El Manial University Hospital. The purpose and nature of the study were explained to gain assistance, and support to carry out the study.

#### **6.2. Implementation phase:**

it was carried out after obtaining official permissions to proceed in the current study. Data were collected over a period of six months starting from September 2013 to February 2014. The researcher visited the selected three settings (unit 1, 2, and ICU of section 23) on daily basis alternatively, most commonly in the day shifts (morning and afternoon shifts). Patients' medical files were reviewed to identify those who matched the inclusion criteria. Then patients were informed individually about the purpose and nature of the study and the researcher obtained written consents from those who accepted to participate in the study. Data collection tools were fulfilled through structured interviews. Each subject spent about 15 to 30 minute for completion of data collection tools. Subjects who could read and write fulfilled the questionnaire by themselves. However, for those who cannot read and write,

the investigator verbalized each statement for the patients and recorded their answer.

## 7-Results

The current study revealed that highest percentage of the studied sample was in the age group of 40 < 50 years old, with a mean age of 46.45 ±12.6, had primary school education and housewives in percentage of 28 %, 48%, and 40 % respectively. The table also clarified that the majority of the studied sample were married and from rural areas in the percentage of 64 % and 60% respectively. It also revealed that 76.0% of the studied sample had lack of sleep disturbance before hospitalization. However, 84 % had sleep disturbances during ICU stay, of these more than two thirds (67 %) had moderate sleep disturbance. Presence of strange and bad odors, noise, having pain, fear of death and a loud voice produced by the ICU personnel had the most significant negative impact on patients' sleep in percentage of 52.4, 50, 61.9, 45.2, 52.4 respectively.

**Figure (1) Percentage Distribution of the Studied Sample as Regards to Number of Sleeping Hours / 24 hrs Before and During ICU Stay, (N= 100).**It showed that the number of sleeping hours ranged from (6-9 hr/day) among more than half (60 %) of the studied sample before ICU stay. However, the number of sleeping hours reduced to be less than 6 hours/day among the majority of the studied sample (74 %) of the studied sample during ICU stay.

**Figure (2) Sleep Quality Before and During ICU Stay as Indicated by the Studied Sample (N= 100) :** It showed that more than three quarters (76.0%) of the studied sample reported no sleep disturbance before hospitalization. However, most of the

studied sample (84 %) reported sleep disturbances during ICU stay, of these more than two thirds (67 %) reported moderate sleep disturbance.

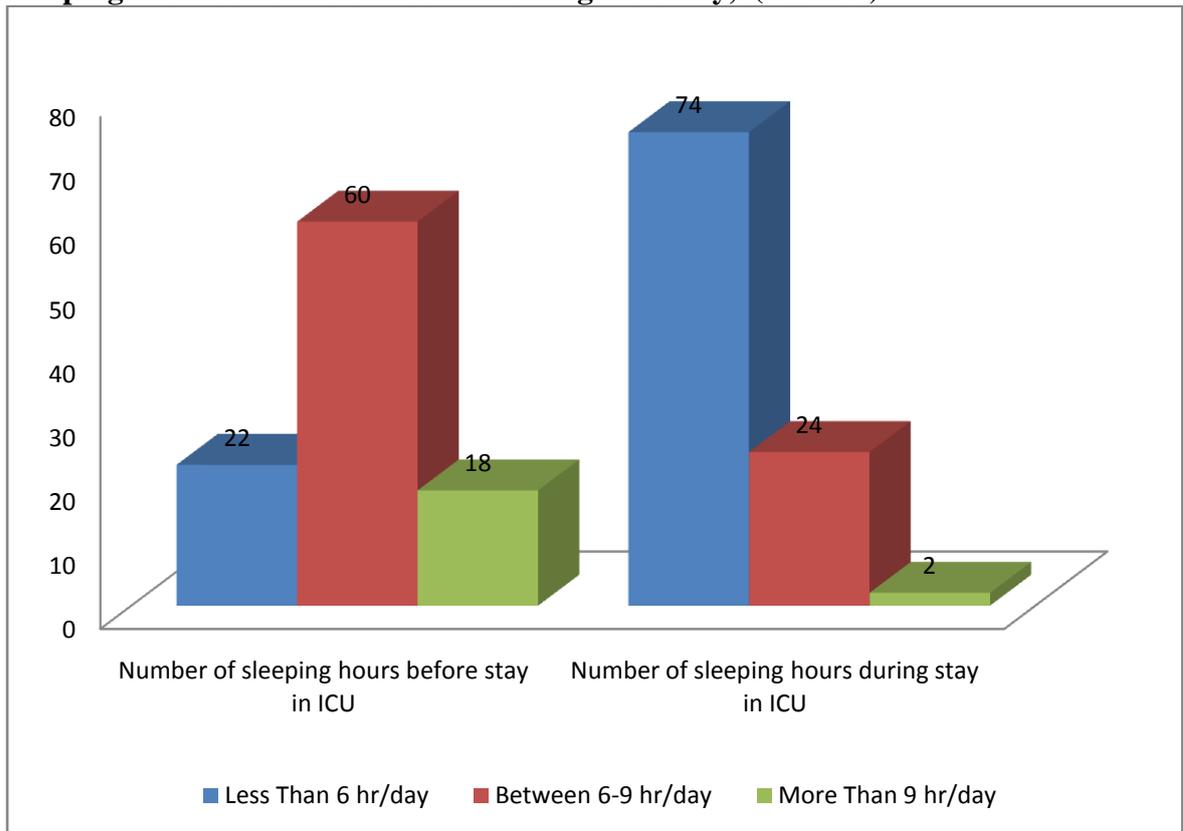
**Table (1) Critical Care Unit Design and Structure as One of the Contributing Factors to Sleep Disturbance among the Studied Group (N= 84).**It showed that presence of strange and bad odors as well as hearing frequent sounds, telephone rings, machine alarms and uncomfortable beds or pillows lead to severe sleep disturbance among the studied sample in percentage of 52.4 %, 50.0 % and 33.3 % respectively.

**Table (2) Factor Predisposing to Sleep Disturbance Related to Patients Themselves during ICU Stay (N= 84).**it showed that having pain, fear of infectious diseases and fear of death lead to severe sleep disturbance as indicated by the studied sample in percentage of 61.9%, 45.2 % and 45.2 % respectively.

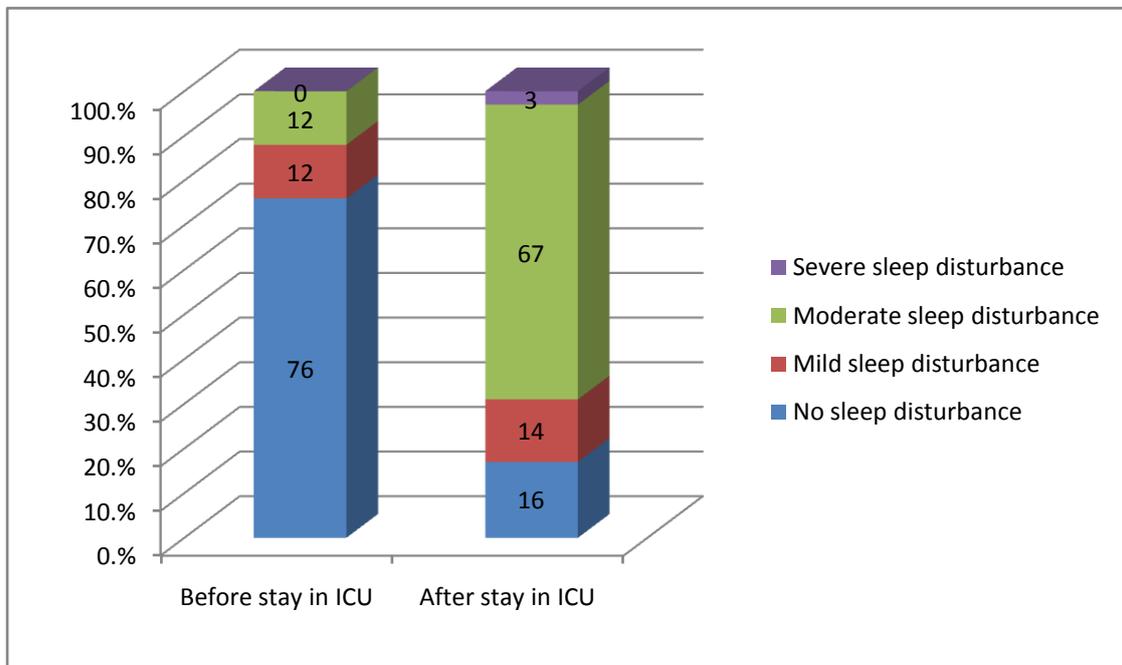
**Table (3) Other Patients as a Predisposing Factor to Sleep Disturbance among the Studied Sample during ICU Stay (N= 84).**It revealed that death of beside patients and crying of surrounding patients from pain lead to severe sleep disturbance among the studied sample in percentage of 57.1 % and 45.2 % respectively.

**Table (4) Critical Care units' Staff and Personnel as Predisposing Factors to Sleep Disturbance among the Studied Group during ICU Stay, (N= 84).**It showed that a loud voice produced by the ICU personnel lead to severe sleep disturbance among more than half (52.4%) of the studied sample.

**Figure (1) Percentage Distribution of the Studied Sample as Regards to Number of Sleeping Hours / 24 hrs Before and During ICU Stay, (N= 100 )**



**Figure (2) Sleep Quality Before and During ICU Stay as Indicated by the Studied Sample (N= 100)**



**Table (1) Critical Care Unit Design and Structure as One of the Contributing Factors to Sleep Disturbance among the Studied Group (N= 84).**

No	Factors	N=84							
		Effect							
		Don't cause sleep disturbance		Cause mild sleep disturbance		Cause Moderate sleep disturbance		Cause Severe sleep disturbance	
		No	%	No	%	No	%	No	%
1	Continuous light	22	26.2	24	28.6	14	16.7	24	28.6
2	Uncomfortable bed or pillow	12	14.3	22	26.2	22	26.2	28	33.3
3	Too hot or too cold room	20	23.8	20	23.8	22	26.2	22	26.2
4	Presence of strange and bad odors	18	21.4	16	19.0	6	7.1	44	52.4
5	Hearing frequent sounds ,telephone ring and machine alarms	12	14.3	8	9.5	22	26.2	42	50.0

- Responses are not mutually exclusive.

**Table (2) Factor Predisposing to Sleep Disturbance Related to Patients Themselves during ICU Stay (N= 84).**

No	ITEM	N=84							
		Don't cause sleep disturbance		Cause mild sleep disturbance		Cause Moderate sleep disturbance		Cause Severe sleep disturbance	
		No	%	No	%	No	%	No	%
1	Restriction by tubes , leads of cardiac monitor and iv sets	8	9.5	20	23.8	30	35.7	26	31.0
2	Having pain	2	2.4	14	16.7	16	19.0	52	61.9
3	Loss of privacy	10	11.9	30	35.7	22	26.2	22	26.2
4	Isolation and the inability to communicate with others	16	19.0	26	31.0	24	28.6	18	21.4
5	Inability to expect what will be done	10	11.9	12	14.3	30	35.7	32	38.1
6	Concern of medical expenses	14	16.7	22	26.2	22	26.2	26	31.0
7	Fear of infectious diseases	8	9.5	12	14.3	26	31.0	38	45.2
8	Fear of death	22	26.2	12	14.3	12	14.3	38	45.2

- Responses are not mutually exclusive

**Table (3) Other Patients as a Predisposing Factor to Sleep Disturbance among the Studied Sample during ICU Stay (N= 84).**

No	ITEM	N=84							
		Don't cause sleep disturbance		Cause mild sleep disturbance		Cause Moderate sleep disturbance		Cause Severe sleep disturbance	
		No	%	No	%	No	%	No	%
1	Crying of surrounded patients from pain.	12	14.3	14	16.7	20	23.8	83	45.2
2	Watching treatments being given to other patients	10	11.9	20	23.8	28	33.3	26	31.0
3	Knowing that the patient beside is died	22	26.2	6	7.1	8	9.5	48	57.1

- Responses are not mutually exclusive.

**Table (4) Critical Care units' Staff and Personnel as Predisposing Factors to Sleep Disturbance among the Studied Group during ICU Stay, (N= 84).**

No	ITEM	N=84							
		Don't cause sleep disturbance		Cause mild sleep disturbance		Cause Moderate sleep disturbance		Cause Severe sleep disturbance	
		No	%	No	%	No	%	No	%
1	Frequent awakening by doctors and nurses	18	21.4	26	31.0	28	33.3	12	14.3
2	a loud voice produced by The ICU personnel	10	11.9	12	14.3	18	21.4	44	52.4
3	No explanation of the patient's treatment regimen	12	14.3	20	23.8	28	33.3	24	28.6

- Responses are not mutually exclusive.

## **8-Discussion**

### **Sample characteristics**

The current study revealed that more than half of the studied sample was middle-aged adults (35-45) years old. As reported by Kozier et al, (2008), middle-aged adults require from 6 to 8 hours per night, and their sleeping pattern generally established at a younger age. While Potter et al, (2013), added that insomnia is particularly common during middle adulthood; they thought that insomnia among this age group may be related to the changes and stresses of the middle age like stresses of job, family relationships or experiencing menopausal symptoms among women.

Regarding age, findings of the current study is in concordance with that of Ugras & Oztekin (2007), who studied patient's perception of environmental factors contributing to sleep disturbances in a neurosurgical intensive care unit, and indicated that the majority of the studied sample was in the middle adulthood. However, Ehlers, Waston & Moleki, (2012), conducted a study of factors contributing to sleep deprivation in a multi- disciplinary intensive care unit in South Africa, contradicted the current study's finding where they found that more than half of the studied sample was older adults.

Concerning marital status, the current study demonstrates that the majority of the studied sample was married. This finding was in agreement with that of Orwelius et al, (2008) who studied Prevalence of sleep disturbances and long-term reduced health-related quality of life after critical care , and found that the majority of the studied sample was married .As well, Su et al, (2013) conducted a randomized controlled trial of the effects of listening to non-commercial music on quality of nocturnal sleep among patients in medical intensive care unit and mentioned that majority of the studied sample was married.

Regarding level of education, the current study revealed that the majority of the sample had primary school education. This finding is contradicted by Moeini et al, (2010) who studied the effect of aromatherapy on the quality of sleep in ischemic heart disease patients in intensive care units where they found that most patients in the experiment group had high school education. Findings of the present study indicated that more than one third of the studied sample was housewives. This is in agreement with that of Moeini et al, (2010) who found that the most of control group was housewives. However the finding of current study is contradicted with Ehlers, Waston & Moleki, (2012) who revealed that the lowest frequent job among the studied sample was housewives.

Regarding place of residence, the current study revealed that more than half of the studied sample was from rural areas. This finding is contradicted by Zhang et al, (2013) who studied factors that affect sleep quality: perceptions made by patients in the intensive care unit after thoracic surgery and found that the majority of their studied sample was from urban areas.concerning to the number of sleeping hours before and during ICU stay, the current study revealed that the number of sleeping hours ranged from (6-9 hr/day) among more than half of the studied sample before ICU stay. However, the number of sleeping hours was less than 6hr/day among around three quarters of the studied sample during ICU stay. Consistent with the present study's finding was that of Little et al, (2012), who reported that patients

estimated their night sleep duration of  $6.5 \pm 2.0$  hours at home compared to  $5.7 \pm 4.1$  hours while admitted to the ICU.

Sleep requirements differ among individuals, although most adults require about eight hours of sleep, some will need only six hours, whereas others need 10. These sleep needs may be genetically determined and may not change significantly throughout most of adulthood. An individual sleep requirement is determined by the number of hours of sleep needed to feel wide awake, alert and a peak level of performance during wakefulness (Mattice, Brooks & Lee-chiong, 2012). As indicated by Stuart (2013), most people sleep between 6 and 9 hours per night. Few people normally sleep less than 5 or more than 10 hours. Usually, people sleep in one nightly phase, although in some cultures and during sometimes of life, afternoon nap is common.

### **Sleep quality as perceived by critically ill patients**

In the current study, the finding data that answered the first research question regarding patient perception of sleep quality showed that more than three quarters of the studied sample, reported no sleep disturbance before hospitalization. However, more than two thirds of the studied sample reported moderate sleep disturbance during their ICU stays. This finding is in agreement with that of Ehlers, Waston & Moleki, (2012) who revealed that more than two thirds of the studied sample, reported that they did not get adequate sleep since their admissions to the ICU.

Findings of the current study concerning sleep quality before and during ICU stay is in concordance with that of Li, et al., (2011) who stated that the studied sample reported poor sleep at ICU as compared to sleep at home. The ICU environment is not favorable for sleep. Noise, frequent care-related activities and continuous lighting in the ICU were found to be correlated with poor interruption to patients' sleep.

### **Factors Predisposing to Sleep Disturbance as Reported by the Studied Group**

Concerning the unit design and structure, the current study demonstrated that Presence of strange and bad odors contributed to sleep disturbance, which is considered as the first influential factor in patient's sleep disturbance. From the researcher's point of view, the presence of strange and bad odor may be related to poor ventilation of the ICU in which the large capacity of patients in limited areas in addition to, delayed maintenance of air conditioners stimulate spread of the strange and bad odors. Another influential factor for presence of strange and bad odors is the fixed time of cleaning Process done by cleaners inside the ICU in which cleaning of ICU usually done at the beginning and at the end of each work shift while the ICU environment require constant cleaning to walls and floors.

As well, findings of the current study revealed that the second contributing factor of sleep disturbance regarding unit design and structure was noise (hearing frequent sounds, telephone rings, and machine alarms) and this finding is in agreement with that of Taştan et al., (2010). Who studied effects of intensive care environment on sleep state of patients and reported that the most influential factor in the patients' sleep was noise. In this regards Xie et al., (2009) indicated that noise negatively affects the people's perception, can disrupt the physiological and psychological balance, decreases the productivity, decreases hearing, increases the gastric secretions, negatively affects the cardiovascular stimulation, stimulates the pituitary and the adrenal glands, suppresses the response to infection and destroys the

serenity and the pleasant environment. The noise that can be tolerated by the patients is rather lower than the noise that the healthy individuals can tolerate.

As regards to factors causing sleeping disturbances related to patients, having pain, fear of infectious diseases and fear of death lead to severe sleep disturbance as indicated by around half of the studied sample. In this regards, Ugras & Oztekin (2007) revealed that feeling pain lead to sleep disturbance as indicated by around two thirds of the studied sample. In addition, Zeilani & Seymour (2012) revealed that Pain was a contributing factor to sleep disturbance in intensive care unit. As apparent from the present study, death of beside patients and crying of surrounding patients from pain lead to severe sleep disturbance among the studied sample. These findings are similar to those found by Ugras & Oztekin (2007) who reported that sounds of surrounding patients lead to sleep disturbance among more than one third of the studied sample as a contributing factor of sleep disturbance in intensive care unit.

The current study revealed that a loud voice produced by the ICU personnel lead to severe sleep disturbance among more than half of the studied sample. This is in consistent with that of Bourne et al, (2007) who revealed that around one third of ICU patients' awakenings are caused by noise generated by conversations and activities of patient care, which make these very significant factors for sleep disturbances, so from the researcher's point of view, ICU personnel especially nurses should minimize their tone of voice as much as possible to create therapeutic environment.

## 9-Conclusion

The study findings confirm previous research results that ICU patients' perceived sleep quality was significantly poorer than baseline sleep at home. Poor sleep quality and daytime sleepiness are problems common to ICU patients, and the environmental etiologies of sleep disruption in the ICU are multifactorial. Presence of strange and bad odors, noise, having pain, fear of death and a loud voice produced by the ICU personnel had the most significant impact on patients' sleep disturbance. Despite the best surgical techniques and drugs, critically ill patients require sleep to recuperate. Nurses and doctors can enhance ICU patients' abilities to sleep, make their stay in the ICU more pleasant, and assist them to regain their physical strength more rapidly, without increasing financial costs.

## 10-Recommendation

- Teach sleep quality assessment and sleep promotion strategies in all basic nursing education programs.
- Create a healing ICU environment that should incorporate noise, light and temperature controls, and decreasing stimuli during night time hours to promote regulation of the circadian rhythm.
- Implement usage of easy sleeping aids such as relaxing music, eye patches and earplugs into daily nursing practice.
- Minimize the duration of day time napping to less than 45 minutes if it is necessary.
- Offer pain control and comfort measures prior to bedtime to improve sleep quality.

- Cluster nursing activities and eliminate nonessential treatments during night time hours to allow uninterrupted sleep periods of at least 90 minutes to complete one sleep cycle.
- Minimize staff conversation, alarm noise and light during the quiet night time hours.

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Effect of Designed Nursing Care.



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