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The University of Arizona, 1987
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UMI
SOCIAL SUPPORT RELATED TO THE SLEEP PATTERN IN
TAIWANESE HOSPITALIZED ADULTS

by

TSU-CHING SHANG

A Thesis Submitted to the Faculty of the
COLLEGE OF NURSING
In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF SCIENCE
In the Graduate College

1987
STATEMENT BY AUTHOR

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ABSTRACT

Social support has been implicated in health outcome through the functions of neuroendocrine responses. One function of body neuroendocrine responses is sleep behavior. The purpose of this study was to test the hypothesis of a positive relationship between social support and adaptation to sleep in Taiwanese hospitalized adults.

Subjects for this descriptive study included 94 Taiwanese hospitalized adults from two hospitals. Of the 94 patients, 30 had social support with the presence of a relative or friend. Subjects were required to have spent two consecutive hospitalized or post-operative nights in order to be included in the study.

Data analysis showed an insignificant difference between supported and unsupported groups in terms of disturbance and effectiveness of sleep. It is recommended that more appropriate measurement of social support be used to test the conceptual framework in the future.
CHAPTER 1

INTRODUCTION

Health care professionals have recently become aware that adaptation to sleep by hospitalized patients is a problem. The problem includes sleep deprivation and a change of sleep patterns. Both the amount of sleep deprivation and the quality of sleep have been investigated by researchers (Goodemote, 1985; Gress, Bahr & Hassanein, 1981; Hilton, 1976; Pacini & Fitzpatrick, 1982). In order to get a normal amount of sleep, hospitalized patients must cope with both their inner and outer environments and increase their adaptive zone to manage stimuli received. Gore (1978) wrote that social support plays an important role in increasing coping ability which is the etiological gate to health and well-being.

Researchers have studied social support in various populations with different methods. The results of these studies showed that "social support had both a direct positive effect on health status and served as a buffer or modifier of the effects of psychosocial and physical stress on the mental and physical health of the individual" (Broadhead, Kaplan, James, Wagner, Schoenbach, Grimson, Heyden, Tibblin and Gehlbach, 1983, p. 521).

The purpose of this research was to demonstrate the relationship between social support and adaptation to sleep for Taiwanese hospitalized adults. The relationship between the sleep
characteristics and supportive network of patients (spouses, relatives and friends) were also tested in this research.

**Delineation of the Problem**

Hospitalization is a change from daily life. When hospitalized, patients must cope with changes in both the internal and external environment; they must adapt to the pressures from physiological distortion and psychosocial change. In general, people associate hospitalization with unpleasant experiences, such as death, pain, separation, isolation, depression, etc. Whether this anxiety-provoking experience is from self or others' experience, it influences some daily behaviors, such as sleep (Carter, 1985).

Sleep pattern changes in hospitalized patients have been investigated by a number of researchers. Hilton (1976) found in a study of 10 patients that both quality and quantity of sleep changed for patients who were hospitalized in a respiratory intensive care unit. Total sleep time ranged from 6 minutes to 13.3 hours during a 24 hour period. Sleep occurred only during 50-60% of the night as contrasted with 100% of the nights slept at home.

Pacini & Fitzpatrick (1982) pointed out in a study of 38 elderly individuals, that during hospitalization sleep patterns changed in terms of nocturnal sleep time, other sleep time, bed time and time of awakening. During hospitalization, health care persons focus on patient care, various therapeutics and routines, assuming that patients will obtain sufficient sleep by napping around these interruptions. This is often not the case, and patients express their
eagerness to go home and get a decent night's sleep. Hospital administrators, physicians and nurses forget that the right to treat is a privilege which is granted by the patients and their significant others (Heater, 1985). Patients can hardly wait to go home and get a decent night's sleep.

Physiology of Sleep

Sleep is an integral part of the rhythm of our daily lives. Sleeping and waking consist of a fairly constant 24 hour circadian rhythm; they are active processes that depend on the interaction of antagonistic brain stem regions. The reticular activating system in the upper brain stem region secretes norepinephrine to maintain wakefulness while serotonin secretion by raphe nuclei produces sleep. The sleep-wakefulness process is also influenced by the balance of impulses received from a higher center, the limbic system, and peripheral receptors (Brewer, 1985).

During wakefulness, the cerebral cortex is very active, sending impulses continuously through the body, but during sleep, transmits fewer impulses (Tortora & Anagnostakos, 1987). The activity of the cerebral cortex is related to the reticular activating system (RAS). When the mesencephalic part of the RAS is stimulated, many impulses pass through the thalamus and disperse into a widespread area of the cerebral cortex. The result is a generalized increase in cortical activity and general wakefulness, or "consciousness" results. When the other part of the RAS is stimulated, signals radiate from a specific part of the thalamus.
causing activity in certain areas of the cerebral cortex; thus arousal occurs—awakening from deep sleep (Tortora & Anagnostakos, 1987).

There are two feedback systems which maintain activation of the RAS, which, in turn, maintains activation of the cerebral cortex. One of the feedback systems acts as a circuit between the RAS and cerebral cortex. The other is a circuit between the RAS, spinal cord and skeletal muscles. The result of activation of these two feedback systems is a state of wakefulness (consciousness). The theory of wakefulness assumes that the level of consciousness depends on the number of feedback circuits operating at one time. When the feedback systems slow tremendously or are inhibited, the state known as sleep is produced (Tortora & Anagnostakos, 1987).

Sleep can be divided into two phases: non-rapid eye movement sleep (NREM) and rapid eye movement sleep (REM). NREM consists of four stages. Stage 1 is a transitional period between wakefulness and the sleep state, which lasts up to 7 minutes in young adults. Individuals are easily awakened during stage 1. Stage 2 is the initial phase of deep sleep. In comparison to stage 1, it is difficult to awaken a person who is in this stage. Fragments of dreams may be experienced and the individual's eyes roll slowly from side to side. Sleep during Stage 2 lasts approximately 20-30 minutes in young adults (Tortora & Anagnostakos, 1987). Stages 3 and 4 together are termed "delta sleep," or slow wave sleep (SWS) (Chuman, 1983). High amplitude delta waves show on electroencephalogram
recordings (EEG) during delta sleep. It is more difficult to awaken a person from this stage, since it is the deepest sleep of the night. Delta sleep is most prevalent during the first half of the night in the young adult (Goodemote, 1985).

REM sleep periods alternate with NREM sleep at about 70-90 minute intervals throughout the night. Most dreaming occurs in REM sleep. REM periods are typically of longer duration as the night progresses (Hoch & Reynolds, 1986; Ganong, 1985; Goodemote, 1985; Tortora & Anagnostakos, 1987); therefore, most dreaming is done during the second half of the night (Goodemote, 1985). Paradoxical sleep is one characteristic of REM sleep. The name "paradoxical sleep" is derived from the fact that the presence of fast cortical EEG activity is simultaneously associated with wakefulness, and diminished muscle tone which is a sign of deep sleep (Chuman, 1983). During REM sleep there is an increase in cerebral blood flow in both hemispheres, and elevation in oxygen consumption, blood pressure and heart rate, while there is a decrease in responsiveness to carbon dioxide (Chuman, 1983).

Functions of Sleep

Sleep has a restorative function both in physiological and psychological processes (Carter, 1985). Growth hormone is secreted from the anterior pituitary during NREM and especially during the delta sleep stages; it plays a role of tissue repair, recovery from fatigue and growth. REM represents approximately 20% of usual sleep time and is linked with memory storage, memory consolidation,
learning and emotional adaptation (Brewer, 1985; Pacini & Fitzpatrick, 1982). These restorative functions are changed when sleep patterns are changed or when sleep deprivation occurs.

Researchers have studied sleep deprivation in laboratory settings. Individuals with sleep deprivation have been shown to have difficulty with memory, concentration, and motor skills. Change in mood, increased fatigue, irritability and aggressiveness also appear in patients with sleep deprivation (Chuman, 1983). Neurologic symptoms are mild nystagmus, hand tremor, decreased pain tolerance, disorientation, personality disorders and a loss of emotional control (Chuman, 1983).

Hilton (1976) found that in persons who experience severe dream deprivation, REM sleep succeeds wakefulness rather than deep sleep. This is called "REM rebound." REM rebound is the most striking feature of REM deprivation. It may aggravate angina, arrhythmia and duodenal ulcer pain (Brewer, 1985).

Hospitalized Patient Sleep

According to Brewer (1985), the factors related to sleep deprivation can be divided into two groups. One group consists of endogenous factors such as illness, emotional stress, etc. The second group, exogenous factors, includes environmental disturbances, transmeridian travel, shiftwork, etc. McNeil (1986) studied 50 patients and developed three concepts to explain sleep deprivation in hospitalized patients. These concepts were (a) physiologic arousal, (b) stimulus control, and (c) circadian sleep-wake rhythm. Other
researchers (Goodemote, 1985; Hilton, 1976) have found that anxiety, depression, pain, environmental noise, discomfort and grief are related to sleep deprivation in hospitalized individuals. In order to get a good night's sleep, a hospitalized individual must be able to adapt to schedule changes and to cope with those factors which distort normal sleep pattern.

Adaptation is a process an individual uses to maintain integrity. Roy (1982) defined adaptation as those positive responses which maintain the integrity of the individual by innate or acquired methods of coping with the changing environment. Since a human being is a biopsychosocial being, individual integrity is sustained not only by satisfying biological needs but also by meeting psychosocial demands (Roy, 1982). Ability to adapt depends upon the degree of change taking place (stimulus), and the state of the biopsychosocial being coping with the change (adaptation zone) (Roy, 1982). If the stimulus is out of the adaptive zone, a maladaptive response occurs. Once the adaptation zone is broad enough to enclose the stimulus, a positive or adaptive response follows, and individual integrity can be obtained (Roy, 1982). Social support plays an important role in increasing coping ability and expanding the potential for health and well-being (Gore, 1978).

**Purpose of the Study**

The purpose of this research was to attempt to investigate the relationship between social support and adaptation to sleep by
hospitalized adults. Four research questions were addressed in this study:

1. What are the mean values for sleep characteristics in two groups of hospitalized patients—one with the presence of supportive persons and one without?

2. Are the sleep characteristics in the supported group different than those in the unsupported group?

3. Is there a difference in the sleep characteristics of male and female patients in the two groups?

4. Does the type of person providing support make a difference in sleep characteristics?

**Significance of the Study**

Sleep deprivation and adaptation to changed sleep patterns in hospitalized patients have been recognized as problems. These problems may not only prolong patients' recovery time, but also increase hospital costs. Therefore, improving adaptation to the hospital environment is a nursing goal. Hilton (1976) and McNeil (1986) have investigated different aspects of changed sleep patterns such as sleep structure, factors which cause sleep deprivation, etc. This researcher hopes to contribute to the growing body of literature, particularly in the area of the relationship between social support and normal sleep patterns.
Summary

Four subjects have been addressed in this chapter. First, the research problem was delineated. Also presented was a review of the literature concerning sleep, sleep deprivation in hospitalized patients, and adaptation to changed sleep patterns. Following the literature review, the purpose of this research was defined as an attempt to demonstrate the relationship between social support and adaptation to changed sleep patterns of hospitalized patients. Last, the contribution of this study to the body of knowledge in nursing was addressed. Chapter 2 will present the conceptual framework used in this study.
CHAPTER 2

CONCEPTUAL FRAMEWORK

The conceptual framework is presented in this chapter. The concepts in the framework and their interrelationships are also described. The conceptual framework proposed for this study is shown in Figure 1.

Social Support

Social support is defined as social relationships in which individuals are utilized as resources when responding to stressful life events. Such support is regarded as the core of mutual help organizations which have proliferated in response to the increased incidence and awareness of stressful life transitions (Gore, 1978). Schaefer et al. (1981) also pointed out that instead of a source of stress, the social environment is a resource which mediates the relationship between stress and health. Social support, as discussed in Chapter 1, is important in preventing and reducing illness and in effecting a more rapid recovery.

Variables such as sex, age, and marital status of the individual affect the quality and quantity of social support (Broadhead et al., 1983). Studies (Billing & Moos, 1984; Broadhead et al., 1983) have shown that the effect of social support on health outcome is always greater for women. The characteristic of age as
Figure 1. Conceptual Framework for the Relationship of Social Support and Adaptation to Sleep by Hospitalized Patients
related to social support was noted by Broadhead et al. (1983) in a study that showed the older an individual was, the more likely he was to report health as a restriction to access the network. Most works found that marital status had a positive relationship to coping effectiveness. McNett (1987) had different results from his work which showed unmarried subjects coped more effectively and perceived less threat.

Supportive Network

A support network can be described as number and content of particular relationships such as friendships, kinships, etc. Social network was defined by Schaefer et al. as "the set of relationships of a particular individual" (1981, p. 383). When there is an absence of a stable social network and social support resources available to individuals living in stressful life circumstances, the risk to health increases (Berkman & Syme, 1979). Social relationships play a critical role in the determination of health status.

A supportive network, then, is a set of social relationships an individual has which are positively associated with that individual's health status. In this concept, the assumption is made that the existence of social relationships is equivalent to obtaining support. The presence of supportive persons was used to measure the supportive network.

A social network includes not only the size but also the quality of social relationships the individual has (Berkman & Syme, 1979). Thus, Berkman & Syme (1979), in a study which included a
random sample of 6,928 adults weighed intimate contacts more heavily than church affiliations or formal and informal group memberships.

Gender is a variable in the concept of supportive network. Women have a larger network in the inner circle of closest relationships, while men's networks are more work-related (Berkman & Syme, 1979). Women also discuss more content areas with those in their networks and feel more helped by these individuals (Berkman & Syme, 1979).

Adaptation to Sleep by Hospitalized Patients

Adaptation to the environment by hospitalized patients results in maintaining a normal sleep pattern during hospitalization. As discussed in Chapter 1, it is not unusual that deprived sleep occurs during a person's hospitalization. There are various factors which cause such deprivation. To adapt to these factors an individual's adaptation zone must be expanded. This enables the patient to respond positively to stimuli and maintain the integrity of sleep during hospitalization (Roy, 1982).

Sleep Patterns

Sleep patterns include the quantity and quality of sleep during the sleep-awake circadian rhythm. In Chapter 1 it was noted that individuals spend one-third of their daily time in sleep to achieve physical and mental restorative functions. Sleep is categorized into two phases, NREM and REM sleep, with NREM sleep
having four stages. In each phase and stage sleep has different characteristics and functions.

Sleep patterns include three factors: (a) sleep effectiveness, (b) sleep disturbance, and (c) sleep supplementation. Sleep effectiveness is determined by the sleep characteristics of rest upon awaking (RUA), subjective quality of sleep (SQS), total sleep period (TSP), total sleep time (TST), and sleep sufficiency evaluation (SSE). Sleep disturbance is determined by the sleep characteristics of mid-sleep awakening (MSA), sleep latency (SL), soundness of sleep (SS), quality of disturbance (QD), quality of latency (QL), wake after sleep onset (WASO), and movement during sleep (MDS). Sleep supplementation is determined by the sleep characteristics of waking after final arousal (WAFA), daytime sleep (DTS), morning sleep (AMS), and afternoon sleep (PMS). Appendix A contains a taxonomy of these sleep characteristics.

Age is an important variable related to sleep patterns. As a person ages, the average time spent sleeping during the night decreases. The percentage of REM decreases because of the shortened length of each REM period (Albert & Albert, 1974; Hoch & Reynolds, 1986; Tortora & Anagnostakos, 1987). There is an increased quantity of Stages 1 and 2 sleep, while slow wave sleep decreases by 50% or more (Hoch & Reynolds, 1986). Since sleep patterns change as persons age, other sleep behaviors develop to compensate for this change, such as spending more time in bed, being sleepy in the daytime, and
needing longer to adjust to changes in the usual sleep-wake circadian rhythm (Hoch & Reynolds, 1986).

**The Relationship between Social Support and Adaptation to Sleep**

Many of the reviewed studies indicated that social support had both a direct positive effect on health status and served as a buffer or modifier of the effects of psychosocial and physical stress on the mental and physical health of the individual. The work done by Broadhead et al. (1983) investigated the evidence for a relationship between social support and health. The result was that the interaction of social support and stressful life events was confirmed by a number of studies.

McNett (1987) studied the social support and coping effectiveness in 50 functionally disabled wheel-chair bound individuals. He found that perceived availability of social support was significantly positively related to coping effectiveness through mediating the variables of problem- and emotion-focus coping and decreased threat. The perceived availability of social support was significantly related to decreased threat appraisal. Gore (cited in McNett, 1987), found that social support affected the appraisal of threat and that people were buffered against stress when helped to redefine a situation as less threatening.

In a study of 100 unemployed subjects and social support, Gore (1978) noted that while unemployed, the unsupported group evidenced significantly higher elevations and more changes in
measures of cholesterol, illness symptoms and effective response than did the supported group. During the anticipation stage of this study, the supported and unsupported groups had very similar cholesterol levels (supported group: 221.2, unsupported group: 222.6). After entering the termination stage, the unsupported employees showed higher cholesterol levels than the supported employees (supported group: 220.9, unsupported group: 247.5) (Gore, 1978).

According to Schaefer, Coyne and Lazarus (1981), three functions of social support are emotional support, tangible support and informational support. Emotional support is the feeling that one is loved or cared about, or even that one is a member of the group, not a stranger. Tangible support involves direct aid or service. Informational support includes giving information and advice as well as providing feedback about how a person is doing (Schaefer et al., 1981). The benefit of the functions of social support is assumed in the concept of social network (Schaefer et al., 1981).

From Billing and Moos' (1984) work in a sample size of 424 subjects, the stress and coping paradigm pointed to social support factors as resources for managing stress and maintaining health. For instance, informal social networks and relationships with intimate partners and family members functioned as the social support factors. Ware and Donald (cited in Broadhead et al., 1983) found in a community survey, a gradual and steady increase in positive well-being with the increase in number of close friends, and relatives.
Tabblin's (1983) study showed the consistency of increasing mortality rate with decreasing scores on his social network.

Berkman and Syme (1979) examined the relationship of social networks to mortality in a large sample population of 6,928 adults. Four sources of social contact were analyzed: marriage, contacts with close friends and relatives, church membership, and informal and formal group associations. The results showed that respondents with each type of social contact had lower mortality rates than respondents lacking those contacts. The risks for unmarried women as compared with married women were approximately 1.4 for each age group. For unmarried men, the relative risk as compared to the married group ranged from 2.1 to 2.9 in different ages (Berkman & Syme, 1979).

Finally, Broadhead et al. pointed out that the effects of social support are not specific to any one disease or organ system, but range from the mental to physical (1983). The mechanism of the effects is dependent on a complex interaction of mind and body mediated through neuroendocrine responses that have a wide range of consequences (Broadhead et al., 1983). As addressed before, sleep behavior is produced through the function of neuroendocrine responses, therefore, sleep should be affected by social support.

**Summary**

In this chapter, a conceptual framework has been addressed and illustrated in Figure 1. The definitions of the concepts in the framework have been discussed and hypothetical relationships between
variables also presented. Methods of testing the framework will be presented Chapter 3.
CHAPTER 3

METHODS

Design

The purpose of this research was to describe the relationships between social support and adaptation to sleep by hospitalized patients. A descriptive design was chosen to answer the research questions:

1. What are the mean values for sleep characteristics in two groups of hospitalized patients—one with the presence of supportive persons and one without?
2. Are the sleep characteristics in the supported group different than those in unsupported group?
3. Is there a difference in the sleep characteristics of male and female subjects in the two groups?
4. Does the type of person providing support make a difference in sleep characteristics?

Setting and Sample

The setting chosen for this study was two hospitals in Taiwan. One was a government institution, the other was a university hospital facility. The medical surgical units of these two hospitals were selected for data collection. The researcher and a research
assistant were involved in data collection for this study from December 30, 1986 to January 24, 1987.

A sample size of 100 male and female adult patients admitted to the medical surgical units in these two hospitals were used. The subjects had to be:

1. alert, oriented and be able to read and speak Chinese;
2. male or female adults, 18 years of age or older;
3. hospitalized for at least one night or one night post-operative prior to data collection;
4. hospitalized patients with a diagnosis other than brain damage or neurological disorder; and
5. patients who evidenced no association with substance abuse (use of alcohol, narcotics or tranquilizers).

The criteria required the subjects to be able to read and speak Chinese. They were also to be alert, oriented, as well as physically and mentally capable of completing the study instruments. Since gender and a variety of ages were considered variables that affected social support, an attempt was made to obtain subjects of both genders and from a variety of age groups. Subjects with associated substance abuse, (use of alcohol, narcotics, or tranquilizers) were not invited to participate in the study, because use of such substances may have already changed the subjects' sleep patterns (Wotring, 1982).
Two consecutive hospitalized or post-operative nights were required for this study to eliminate other possible sleep deprived factors, such as an unfamiliar hospital setting. The criterion excluding those patients with a diagnosis of brain damage or neurological involvement precluded neurologic abnormalities which would possibly influence the normal sleep patterns of subjects.

Protection of Human Rights

This study was approved by the Ethical Review Committee of the University of Arizona, College of Nursing (Appendix B). A disclaimer was given to each subject and oral consent was required before any data were collected. Confidentiality of the information was assured by assigning each subject a code number. Subjects were told that this study would not endanger their health and that they had the right to withdraw from the study at any time without consequences.

Data Collection Protocol

Patients' charts, kardexes and staff nurses on the unit were used as resources to obtain subjects for the study. Patients were recruited once they met the above criteria. A disclaimer which explained the purpose of the study and their rights as subjects was provided to the patients (Appendix C, with a Chinese translated form). In the afternoon, study instruments were left with patients who agreed to participate. These instruments were the Verran and Snyder-Halpern (VSH) Sleep Scale (Appendix D is a reduced VSH with a
Chinese translated scale) and the Subject Information Questionnaire (Appendix E with a Chinese translated form). Subjects were asked to complete the instruments the next morning within two hours after awakening. The completed VSH Sleep Scale and Subject Information Questionnaire were collected in the same morning. The Subject Information Questionnaire Chart Form (Appendix F with a Chinese translated form) was filled out by investigators according to the patients' charts and medication records.

**Instrumentation**

A translated version of Verran and Snyder-Halpern (VSH) Sleep Scale was used as the operational indicator to measure the dependent variable for this study. The VSH Sleep Scale is a visual analogue instrument utilizing a 100 millimeter response line. It is an instrument easy to use and also provides consistent and valid information (Snyder-Halpern & Verran, 1987). The subject was required to make a vertical mark on the line to indicate feelings and attitudes in response to two extreme statements.

This 100 millimeter response line was scored from 0 to 100 points, from the left to the right side. The subject's score was then measured by the location of a vertical mark crossing each response line. The higher the score on each item, the greater the value of that sleep characteristic. Exceptions to this process were questions numbers 7 and 15, which measure the characteristics of SS and SSE. These items were reversed scored to indicate greater sleep disruption and sleep effectiveness respectively.
The validity of VSH Sleep Scale has been examined by factor analysis. Two sleep factors were labeled as sleep disturbance and sleep effectiveness (Snyder-Halpern & Verran, 1987). The theta reliability of the analogue scale was very good for a new instrument. The overall theta was 0.91. The theta reliability for the factor of sleep disturbance was 0.86 and 0.89 for the factor of sleep effectiveness. No reliability or validity data were available for the supplementation factor at the time data were collected (J. A. Verran, personal communication, June 25, 1987). The reliability on subscales was retested for this study.

In addition to these 15 questions, there were two other questions added onto the VSH Sleep Scale to test attitudes about the relationship of social support to adaptation of sleep by hospitalized patients. These two additional questions did not belong to the VSH Sleep Scale. The first question was "I strongly disagree—strongly agree that my friends and relatives can help me get a good night's sleep while I am in the hospital" (SSS). The second was "I strongly disagree—strongly agree that I cannot get a good night's sleep without the company of friends or relatives while I am hospitalized" (SLSS).

The research instruments were translated and checked by the method of back-translation. The researcher translated all the questions from English to Chinese and then asked Chinese people who knew both English and Chinese to translate them back into English. After the back-translation of the research instruments was done,
three Chinese people were asked to complete the questionnaires before the study began in order to test the comprehensiveness of the instruments.

The Subject Information Questionnaire was used as the operational indicator to determine the concept of supportive network. The question of social relationships of the subject was asked on this instrument. The Subject Information Questionnaire was also used to collect demographic data.

The Subject Information Questionnaire Chart Form was used to collect the information related to hospitalization and medication. This form was filled out by the investigators according to subjects' charts and medication record.

**Data Analysis**

Data analysis for this study was done by examining each of the following research questions:

1. What are the mean values for each sleep characteristics in the two groups of patients—one with and without the presence of supportive persons? Descriptive statistics were used to analyze this question.

2. Are the sleep characteristics of hospitalized patients different for those in the supported group different than for those in unsupported group? To answer this question t-tests were used to analyze each of the characteristics and subscales.
3. Is there a difference in sleep characteristics of male and female subjects in the two groups? This question was analyzed by a two way ANOVA for each characteristic and subscale.

4. Does the type of person providing support make a difference in sleep characteristics? A one way ANOVA for each characteristic and subscale was done to answer this research question.

Summary

In this chapter the methodology for this research has been presented. The research design, setting and sample for data collection, protection of human rights, and data collection protocol have been explained. The instruments used in this research including the VSH Sleep Scale, Subject Information Questionnaire, and the Subject Information Questionnaire Chart Form were discussed, as well as the types of data analysis used. Chapter 4 will present the results obtained from this investigation.
CHAPTER 4

RESULTS

A description of the sample and the results of the responses to all research questions are presented in this chapter.

Description of the Sample

There were 104 hospitalized adults from two different hospitals (China Medical College Hospital and Veterans General Hospital) who participated in this study. Since 10 subjects did not answer the questions in a manner that allowed for accurate measurement they were omitted; thus data analysis was done with answers from 94 subjects, 35 female and 59 male patients (Table 1).

The age range of the subjects was from 18 to 78 years. The mean age was 43.0 years with a standard deviation of 17.3 years. The usual bed time for the subjects was from 9 p.m. to 11 p.m., and usual awakening time was from 6 a.m. to 7 a.m.

A majority of the subjects were married (60%); 35% were single. In answer to the questions regarding employment 42% of the subjects reported they were employed full-time. The marital status and employment status are shown in Tables 2 and 3.

The number of days of hospitalization ranged from 2 to 182 days. The mean was 13.0 days with a standard deviation of 25.7 days. The high standard deviation was a result of the wide range of number
Table 1. Frequency and Percentage of Gender in Total Group (n = 94)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>35</td>
<td>37.2</td>
</tr>
<tr>
<td>Male</td>
<td>59</td>
<td>62.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>94</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Frequency and Percentage of Marital Status in Total Group (n = 94)

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>33</td>
<td>35.1</td>
</tr>
<tr>
<td>Married</td>
<td>57</td>
<td>60.6</td>
</tr>
<tr>
<td>Divorced</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Separated</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>94</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 3. Frequency and Percentage of Employed Status in Total Group
(n = 94)

<table>
<thead>
<tr>
<th>Employed Status</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Time Student</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td>Full Time Employed</td>
<td>39</td>
<td>41.5</td>
</tr>
<tr>
<td>Part Time Employed</td>
<td>20</td>
<td>21.3</td>
</tr>
<tr>
<td>Retired</td>
<td>19</td>
<td>20.2</td>
</tr>
<tr>
<td>Unemployed</td>
<td>14</td>
<td>14.9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>94</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
of days hospitalized. The mode and median of number of hospitalized
days were 4 and 5 days respectively.

Of the 94 subjects, 51% stated they lost sleep due to illness
in the last two months; 27% of those responding needed routine
assistance to sleep. Eight of these patients (8.5%) worked night
shift the two months prior to the study and 3 patients (3.2%) were
expecting to work night shift in the following 2 months. Stress was
experienced by 44% of the subjects causing them to lose their normal
sleep time. These variables are further described in Table 4.

Most surgical patients had surgery one week after admission
and completed the questionnaires before surgery, therefore, many of
the subjects (72%) were coded as being on medical service (Table 4).

During the period of the study the questionnaires were
administered 6 patients (6.4%) were given sleep medication at night
and 4 patients (4.3%) took hypnotics and/or tranquilizers. None of
them habitually used sleeping pills. This was probably a reflection
of the cultural background of the subjects who might have different
beliefs about taking various medications.

There were 32 patients from site one (China Medical College
Hospital) and 62 patients from site two (Veterans General Hospital).
Of the 30 patients (31.9%) who had supportive persons with them
at night, 13 patients were in site one and the rest were in site
two. These patients consisted of 16 males and 14 females (Table 5).
Table 6 describes the frequency and percentage of the presence of
different supportive relationships in the supportive groups.
Table 4. Frequency and Percentage of Subject Characteristics in Total Group (n = 94)

<table>
<thead>
<tr>
<th>Subject Characteristics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep loss last two months</td>
<td>48</td>
<td>51.1</td>
</tr>
<tr>
<td>Applying routine assistance for sleep</td>
<td>25</td>
<td>26.6</td>
</tr>
<tr>
<td>Working night shift previous two months</td>
<td>8</td>
<td>8.5</td>
</tr>
<tr>
<td>Going to work night shift next two months</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td>Experiencing sleep loss</td>
<td>41</td>
<td>43.6</td>
</tr>
<tr>
<td>Having supportive company</td>
<td>30</td>
<td>31.9</td>
</tr>
<tr>
<td>Medical service</td>
<td>68</td>
<td>72.3</td>
</tr>
<tr>
<td>Sleep medication administered</td>
<td>6</td>
<td>6.4</td>
</tr>
<tr>
<td>Hypnotics/tranquilizer administered</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>Chronic sleeper used</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 5. Number of patients with and without Support in Each Site

<table>
<thead>
<tr>
<th>Site</th>
<th>Total</th>
<th>Male</th>
<th>Fem.</th>
<th>Total</th>
<th>Male</th>
<th>Fem.</th>
<th>Total</th>
<th>Male</th>
<th>Fem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>4</td>
<td>9</td>
<td>19</td>
<td>12</td>
<td>7</td>
<td>32</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>12</td>
<td>5</td>
<td>45</td>
<td>13</td>
<td>14</td>
<td>62</td>
<td>19</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td><strong>30</strong></td>
<td><strong>16</strong></td>
<td><strong>14</strong></td>
<td><strong>64</strong></td>
<td><strong>43</strong></td>
<td><strong>21</strong></td>
<td><strong>94</strong></td>
<td><strong>35</strong></td>
</tr>
</tbody>
</table>

Site 1 = China Medical College Hospital
Site 2 = Veterans General Hospital

Table 6. The Frequency and Percentage of Various Supportive Persons for the Supported Group (n = 30)

<table>
<thead>
<tr>
<th>Supportive Person</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse</td>
<td>13</td>
<td>43.3</td>
</tr>
<tr>
<td>Relative</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td>Friend</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>30</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Reliability of Subscales

The alpha coefficient of the subscale supplementation was .73 which was very good for a new instrument used in translated form with a different cultural population. The reliability coefficients were .78 and .83 for the subscales of effectiveness and disturbance and were also good for such an instrument tested with a different population.

Data Related to Research Questions 1 and 2

The results of the responses to the first research question are presented in Table 7. One of the goals of this research was to find the mean values for each of the sleep characteristics in the two groups of patients—one group with the presence of supportive persons and one group without.

Interestingly, all the mean values of sleep characteristics in the factor of disturbance in the supported group were higher than for those in the unsupported group. This means that people in the supported group experienced more disturbance than those in the unsupported group. But these differences were statistically insignificant as examined with t-tests (Table 7).

The mean values of TST, RUA and TSP in the subscale of effectiveness, were higher for those in the supported group than for those in the unsupported group. The mean values of SQS and SSE in the supported group were lower than for those in the unsupported group. Again, those differences were not significant. The mean values of the effectiveness subscale in both groups were almost the
Table 7. Means of All the Sleep Characteristics in Supported and Unsupported Groups and a Comparison of t-Values

<table>
<thead>
<tr>
<th>Sleep Characteristics</th>
<th>Supported Group</th>
<th>Unsupported Group</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X ± S.D. (n)</td>
<td>X ± S.D. (n)</td>
<td></td>
</tr>
<tr>
<td>Disturbance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WASO</td>
<td>43.6 ± 22.8 (n = 28)</td>
<td>39.9 ± 25.9 (n = 63)</td>
<td>0.66</td>
</tr>
<tr>
<td>SL</td>
<td>46.8 ± 31.4 (n = 29)</td>
<td>39.4 ± 26.3 (n = 61)</td>
<td>1.17</td>
</tr>
<tr>
<td>RVSS</td>
<td>57.0 ± 27.6 (n = 29)</td>
<td>53.2 ± 26.9 (n = 61)</td>
<td>0.61</td>
</tr>
<tr>
<td>QD</td>
<td>42.0 ± 27.5 (n = 26)</td>
<td>39.8 ± 27.0 (n = 63)</td>
<td>0.34</td>
</tr>
<tr>
<td>MSA</td>
<td>60.3 ± 28.2 (n = 29)</td>
<td>52.8 ± 29.2 (n = 64)</td>
<td>1.16</td>
</tr>
<tr>
<td>QL</td>
<td>43.8 ± 32.4 (n = 29)</td>
<td>41.7 ± 30.8 (n = 64)</td>
<td>0.30</td>
</tr>
<tr>
<td>MDS</td>
<td>57.2 ± 25.9 (n = 29)</td>
<td>50.1 ± 26.4 (n = 61)</td>
<td>1.19</td>
</tr>
<tr>
<td>TDIST</td>
<td>50.5 ± 20.3 (n = 29)</td>
<td>45.2 ± 17.5 (n = 61)</td>
<td>1.27</td>
</tr>
<tr>
<td>Effectiveness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TST</td>
<td>56.1 ± 21.8 (n = 28)</td>
<td>54.6 ± 24.1 (n = 58)</td>
<td>0.28</td>
</tr>
<tr>
<td>RUA</td>
<td>57.3 ± 27.5 (n = 29)</td>
<td>56.0 ± 27.7 (n = 63)</td>
<td>0.21</td>
</tr>
<tr>
<td>SQS</td>
<td>56.8 ± 26.6 (n = 29)</td>
<td>58.5 ± 24.6 (n = 63)</td>
<td>-0.30</td>
</tr>
<tr>
<td>RVSSSE</td>
<td>58.2 ± 28.4 (n = 29)</td>
<td>62.8 ± 28.5 (n = 64)</td>
<td>-0.73</td>
</tr>
<tr>
<td>TSP</td>
<td>96.3 ± 27.4 (n = 29)</td>
<td>90.1 ± 29.5 (n = 63)</td>
<td>0.95</td>
</tr>
<tr>
<td>TEFF</td>
<td>64.8 ± 15.7 (n = 28)</td>
<td>64.7 ± 18.2 (n = 58)</td>
<td>0.03</td>
</tr>
<tr>
<td>Supplementation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAFA</td>
<td>22.9 ± 22.8 (n = 29)</td>
<td>35.2 ± 29.5 (n = 64)</td>
<td>-1.99*</td>
</tr>
<tr>
<td>DTS</td>
<td>26.4 ± 21.0 (n = 28)</td>
<td>33.7 ± 25.8 (n = 63)</td>
<td>-1.32</td>
</tr>
<tr>
<td>AMS</td>
<td>29.7 ± 31.5 (n = 29)</td>
<td>44.2 ± 35.7 (n = 61)</td>
<td>-1.88*</td>
</tr>
<tr>
<td>PMS</td>
<td>40.8 ± 30.3 (n = 29)</td>
<td>50.4 ± 35.4 (n = 61)</td>
<td>-1.25</td>
</tr>
<tr>
<td>TSUPP</td>
<td>29.7 ± 22.1 (n = 28)</td>
<td>40.9 ± 22.5 (n = 61)</td>
<td>-2.19*</td>
</tr>
<tr>
<td>Additional Questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSS</td>
<td>62.0 ± 25.5 (n = 28)</td>
<td>38.0 ± 27.7 (n = 63)</td>
<td>3.89*</td>
</tr>
<tr>
<td>SLSS</td>
<td>56.1 ± 26.8 (n = 29)</td>
<td>33.1 ± 24.6 (n = 62)</td>
<td>4.05*</td>
</tr>
</tbody>
</table>

X ± S.D. = Mean ± Standard Deviation
n = Number of subjects in the group.
* = significant @ p ≤ .05
same. The mean of effectiveness in the supported group was 64.8, and in the unsupported group was 64.7.

Two sleep items under the supplementation factor were significantly different between the two groups. These were the sleep characteristics of WAFA and AMS. The mean value of WAFA in the supported group was 22.9 and in the unsupported group was 35.2; t-value for this item was -1.99 (critical t = +1.66). The mean value of AMS in the supported group was 29.7 and in the unsupported group was 44.2; t-value for this item was -1.88 (critical t was +1.66). The mean value of the supplementation subscale in the supported group was significantly lower than that in the unsupported group; t-value was -2.19 (critical was +1.66).

The two questions, SSS and SLSS, added on to the VSH Sleep Scale to test the attitude about the presence of a supportive network were significantly different between the two groups. The mean values of these two items in the supported group were significantly higher than for those in the unsupported group (Table 7).

**Data Related to Research Question 3**

The mean values of all the sleep characteristics by company and by sex are described in Table 8, and the results of a 2-way ANOVA, F-values for the main effect of support, gender and the interaction of support and gender are presented in Table 9. The results of the effect of gender in two sleep items were significant and both of them were under the factor of supplementation. These two sleep items were DTS and PMS. Male subjects in the supported group
Table 8. Mean Values of Sleep Characteristics for Main Effects of Support and Gender

<table>
<thead>
<tr>
<th>Disturbance</th>
<th>G1 = Company</th>
<th>G2 = No Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASO</td>
<td>(G = 13)</td>
<td>(G = 21)</td>
</tr>
<tr>
<td>SL</td>
<td>(G = 14)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>RVSS</td>
<td>(G = 13)</td>
<td>(G = 21)</td>
</tr>
<tr>
<td>QD</td>
<td>(G = 11)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>MSA</td>
<td>(G = 13)</td>
<td>(G = 21)</td>
</tr>
<tr>
<td>QL</td>
<td>(G = 13)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>NSD</td>
<td>(G = 13)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>TDIST</td>
<td>(G = 13)</td>
<td>(G = 21)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>G1 = Company</th>
<th>G2 = No Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST</td>
<td>(G = 12)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>RUA</td>
<td>(G = 13)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>SQS</td>
<td>(G = 13)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>RVSS</td>
<td>(G = 13)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>TSP</td>
<td>(G = 13)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>TFF</td>
<td>(G = 12)</td>
<td>(G = 16)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplementation</th>
<th>G1 = Company</th>
<th>G2 = No Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAFS</td>
<td>(G = 13)</td>
<td>(G = 21)</td>
</tr>
<tr>
<td>BNS</td>
<td>(G = 13)</td>
<td>(G = 16)</td>
</tr>
<tr>
<td>AMS</td>
<td>(G = 13)</td>
<td>(G = 20)</td>
</tr>
<tr>
<td>PHS</td>
<td>(G = 13)</td>
<td>(G = 20)</td>
</tr>
<tr>
<td>TSUPP</td>
<td>(G = 13)</td>
<td>(G = 20)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Questions</th>
<th>G1 = Company</th>
<th>G2 = No Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
<td>(G = 12)</td>
<td>(G = 21)</td>
</tr>
<tr>
<td>SLSS</td>
<td>(G = 13)</td>
<td>(G = 21)</td>
</tr>
</tbody>
</table>

X ± S.D. = Mean ± Standard Deviation  
*n* = Number of subjects in the group.
<table>
<thead>
<tr>
<th></th>
<th>Support F</th>
<th>Gender F</th>
<th>Interactions F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Disturbance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WASO</td>
<td>0.61</td>
<td>0.001</td>
<td>2.02</td>
</tr>
<tr>
<td>SL</td>
<td>0.27</td>
<td>0.05</td>
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<td>1.78</td>
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<tr>
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<td>0.12</td>
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<tr>
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<td>0.21</td>
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<tr>
<td>TST</td>
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<td>1.503</td>
<td>5.41*</td>
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<tr>
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<td>1.61</td>
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<tr>
<td>DTS</td>
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<tr>
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<td>PMS</td>
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<td>6.00*</td>
<td>6.75*</td>
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<td>TSUPP</td>
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<td>2.98</td>
<td>3.09</td>
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<tr>
<td>SSS</td>
<td>14.10*</td>
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<td>0.41</td>
</tr>
<tr>
<td>SLSS</td>
<td>16.01*</td>
<td>0.22</td>
<td>1.11</td>
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</table>

*Significant @ p ≤ 0.05.
had more day time sleep than the female subjects in the same group. (The mean for males was 28.20, the mean for females was 24.31.) In contrast, female subjects in the supported group got more PMS than the male subjects in the same group (the mean for male subjects was 37.00, while the mean for female subjects was 45.54).

According to the analyzed data, the interaction of support and gender also influenced two other sleep characteristics: TST and PMS. TST was an effectiveness factor, PMS was a supplementation factor. None of the sleep characteristics which were a part of the disturbance factor was significantly associated with support, gender or interaction of support and gender.

F-values of AMS (morning sleep), TSUPP (Supplementation), SSS (Sleep with Social Support) and SLSS (Sleep Loss without Social Support) in the supported group were significantly different from those in the unsupported group (Table 9). This result supported the results obtained from the t-tests (Table 7).

**Data Related to Research Question 4**

Data analysis of the effect of supportive relationships is described in Table 10. Three relationships were divided into the spouse group, the relative group and the friend group. The sleep item of QL (Quality of Latency) was significantly different among these three groups. The relative group had more disturbance than the others. (The mean of the relative group was 62.64, of the spouse group was 31.08 and for the friend group it was 32.00.)
Table 10. One Way ANOVA for Effect of Supportive Relationships

<table>
<thead>
<tr>
<th>Supportive Relationships</th>
<th>F-Value</th>
<th>$\overline{X}$ ± S.D. of G1 (n)</th>
<th>$\overline{X}$ ± S.D. of G2 (n)</th>
<th>$\overline{X}$ ± S.D. of G3 (n)</th>
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<tr>
<td>WASO</td>
<td>0.30</td>
<td>40.23 ± 19.59</td>
<td>46.27 ± 18.71</td>
<td>37.67 ± 43.29</td>
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<tr>
<td>IL</td>
<td>2.04</td>
<td>55.24 ± 30.46</td>
<td>63.73 ± 26.61</td>
<td>44.00 ± 43.85</td>
</tr>
<tr>
<td>RSS</td>
<td>0.18</td>
<td>57.64 ± 29.12</td>
<td>61.64 ± 23.92</td>
<td>51.50 ± 42.64</td>
</tr>
<tr>
<td>QD</td>
<td>1.20</td>
<td>37.09 ± 31.25</td>
<td>32.36 ± 19.26</td>
<td>32.00 ± 36.26</td>
</tr>
<tr>
<td>NSA</td>
<td>1.44</td>
<td>51.15 ± 29.23</td>
<td>68.55 ± 38.32</td>
<td>69.25 ± 38.56</td>
</tr>
<tr>
<td>QL</td>
<td>3.80*</td>
<td>31.08 ± 32.96</td>
<td>62.64 ± 21.72</td>
<td>32.00 ± 37.21</td>
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<tr>
<td>NDS</td>
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<td>50.15 ± 31.58</td>
<td>64.00 ± 20.74</td>
<td>69.25 ± 19.97</td>
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<td>TDIST</td>
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<td>43.84 ± 20.79</td>
<td>59.59 ± 18.09</td>
<td>48.25 ± 26.21</td>
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<td></td>
</tr>
<tr>
<td>TST</td>
<td>5.79*</td>
<td>65.31 ± 19.95</td>
<td>45.36 ± 18.20</td>
<td>78.67 ± 6.36</td>
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<td>RIA</td>
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<td>49.09 ± 22.98</td>
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<td>DQS</td>
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<td>67.08 ± 22.31</td>
<td>37.27 ± 16.91</td>
<td>81.00 ± 17.46</td>
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<tr>
<td>RNSSE</td>
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<td>65.08 ± 28.60</td>
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<td>72.02 ± 12.04</td>
<td>53.13 ± 11.30</td>
<td>80.60 ± 11.68</td>
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<td>Supplementation</td>
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<tr>
<td>WAFA</td>
<td>1.16</td>
<td>18.23 ± 15.67</td>
<td>27.00 ± 26.79</td>
<td>38.25 ± 38.83</td>
</tr>
<tr>
<td>RIS</td>
<td>2.21</td>
<td>50.69 ± 17.07</td>
<td>23.91 ± 20.32</td>
<td>45.25 ± 31.98</td>
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<tr>
<td>ANS</td>
<td>0.88</td>
<td>25.69 ± 30.80</td>
<td>26.55 ± 30.73</td>
<td>48.25 ± 42.25</td>
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<tr>
<td>PHS</td>
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<td>29.30 ± 57.95</td>
<td>41.27 ± 29.73</td>
<td>49.50 ± 35.03</td>
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<td>TSUPP</td>
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<td>23.50 ± 19.64</td>
<td>29.18 ± 17.89</td>
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<td>Additional Questions</td>
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<tr>
<td>JSS</td>
<td>1.29</td>
<td>64.98 ± 26.97</td>
<td>65.73 ± 21.75</td>
<td>42.25 ± 36.40</td>
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<tr>
<td>SLSS</td>
<td>1.51</td>
<td>54.15 ± 30.13</td>
<td>63.64 ± 20.85</td>
<td>36.00 ± 34.73</td>
</tr>
</tbody>
</table>

$\overline{X}$ ± S.D. = Mean ± Standard Deviation
n = Number of subjects in the group
* = Significant if $p \leq 0.05$
G1 = Spouse Group
G2 = Relative Group
G3 = Friend Group
The different relationships significantly influence the effectiveness of sleep characteristics of the effectiveness factor: TST (Total Sleep Time), SQS (Subjective Quality of Sleep) and SSE (Sleep Sufficiency Evaluation). Unexpectedly, when compared, the results indicate the relative group got the least sleep, and the friend group had the best sleep (Table 10).

For sleep supplementation and all the sleep characteristics included in the factor of supplementation there was no significant difference among the various supportive relationship groups. There was also no significant difference found in terms of the attitude about the role of social support in adaptation to sleep by hospitalized patients among the three groups.

Conclusion

The purpose of this study was to demonstrate the relationship between social support and adaptation to sleep for Taiwanese hospitalized adults, as well as to test the relationship between the sleep characteristics and the supportive network of patients. According to the conceptual framework presented in Chapter 2, during hospitalization patients in the supported group should get a better night's sleep than patients in the unsupported group. The results obtained from this research did not support the conceptual framework. In fact the results show that patients in the supported group had significantly less sleep supplementation. Although there was no significant difference between the supported and the unsupported group for either the factors of disturbance and effectiveness, there
was a significant difference between the groups in terms of attitudes about the relationship of social support to adaptation to sleep by hospitalized patients. Patients in the supported group had a higher evaluation of the presence of the supportive network than those in the unsupported group.

Summary

A sample size of 94 subjects was presented in which 32 patients were from site one, and 62 patients were from site two. Of these patients 35 were female and 59 were male. The mean age of the sample was 43.0 years. The usual bedtime for the sample was from 9 p.m. to 11 p.m. and usual awakening time was from 6 a.m. to 7 a.m. During the nights of this study 30 patients (31.9%) had company, 43.3% were accompanied by their wives, 36.7% were accompanied by their relatives and 13.3% were accompanied by friends.

The results of the t-test of the sleep factors of disturbance and effectiveness indicate the presence of supportive persons did not make a significant difference between the supported and unsupported groups. There was a significant difference between the two groups in the supplementation factor, a t-value of -2.19 was found (critical t = ± 1.662).

Gender was another factor associated with significant differences between the two groups, indicated by the data (DTS and PMS). The interaction of support and gender was also significantly different for the sleep characteristics of TST and PMS.
Various supportive relationships were also associated significantly with the sleep characteristics of QL, TST, SQS, and SSE. Interestingly, the support of a friend was associated with the best night's sleep for hospitalized patients, the spouse group ranked second and the relative group was the least associated with a good's night sleep.

Compared to the unsupported group, the supported group had much higher scores in terms of attitudes toward the relationship of social support to adaptation to sleep of a hospitalized patient. Chapter 5 will present a discussion of the results obtained from this study.
CHAPTER 5

DISCUSSION

In this chapter, the relationship of findings to the conceptual framework, the limitations of the study, implications for nursing practice and implications for further research will be presented.

Relationship of Findings to the Conceptual Framework

According to the conceptual framework discussed in Chapter 2, social support had a positive relationship to the adaptation to sleep by hospitalized patients. In effect, the presence of supportive persons would help hospitalized patients adapt to the environment and thus get a normal amount of sleep. According to the data obtained from this study, the conceptual framework was not supported. Patients in the supported group had significantly less sleep supplementation and had insignificantly more sleep disturbance than those patients in the unsupported group. This result was unexpected.

This unexpected finding might be the result of several factors. First, the patients' sleep may have been disturbed by noise produced by their supportive persons. Second, patients may have focused on what their supportive persons were doing instead of sleeping. They might have paid more attention to the presence of their supportive persons than to their own sleep. Third, the
subjects may have felt uncomfortable with the presence of supportive persons (e.g., they may have felt guilt, shame, restricted, etc.). A fourth factor which may have caused this unexpected result was that the measurement of social support was not accurate.

The measurement of social support was the presence of supportive persons which is not equivalent to getting support and adapting to sleep by a hospitalized patient. Social support is not a unitary but a multidimensional concept (McNett, 1987). Beside the social network, perceived social support is another concept under social support. This is the person's perception of the supportive value of social interaction. Social network membership may involve some other elements in addition to support such as demands, constraints, interpersonal strife which might dilute the positive effects of support, causing unexpected adaptive outcomes (Schaefer et al., 1981).

It is interesting that the two groups (supported and unsupported) had significantly different attitudes about the presence of supportive persons to adaptation to the hospital environment. Patients in the unsupported group showed a much less positive attitude about the presence of supportive persons, but they experienced the same sleep effectiveness as patients in the supported group. Again, this might be associated with the reasons presented earlier. Patients in the unsupported group might have had other support resources than the presence of supportive persons, such as recalling good memories, or perceiving support from family or
friends' behaviors (for instance, receiving a long distance call from family or friends, etc.). Therefore, even though they were without the presence of supportive persons, they could adjust themselves well and had the same sleep effectiveness as patients in the supported group.

Gender was a variable in the social support concept and was supported by the data obtained, even though the difference was not significant. Lower mean values for most of the sleep characteristics in the factor of disturbance, and higher mean values for each sleep characteristics in the factor of effectiveness were found in the female group. This indicates that female patients slept better than male patients. The sleep characteristic PMS in the factor of supplementation was significantly different between the two genders, females getting more sleep than the males. This paralleled reports from the literature.

The result of the effect of supportive relationships was unexpected and different from the work done by Barkman and Symel (1979). In this study patients in the group supported by friends slept better than the other two groups (those supported by spouses and relatives). Patients in the group supported by relatives slept the worst. As mentioned in the beginning of this chapter, social network membership may involve other elements in addition to support. Patients in the group supported by friends might have fewer demands, constraints or interpersonal strife and the positive effects of support was diluted less than for those in the other two groups.
Limitations of the Study

The main and apparent limitation of the study is the measurement of social support. The presence of supportive persons is not the same as perceived social support and is not equivalent to getting social support. In addition to receiving support, patients in the supported group may also receive other input from network membership which decreases the effect of support.

The second limitation is that the number of subjects in the supported group was small, especially the group having friends for support (4). This might have skewed the results.

The third limitation is that subjects were not familiar with the correct method of completing the research instruments. Since people in Taiwan are unaccustomed to being research subjects, most people did not have any experience in filling out research instruments. In addition, the VSH Sleep Scale was a visual analog scale which was translated from another language. This is a major consideration in the limitations affecting research accuracy.

Implications for Nursing Practice

Since there were unexpected results in this study, more work must be done before implications for nursing practice will be known. But one thing should be mentioned. Although patients in the supported group had more sleep disturbance and less sleep supplementation, they still had strong positive attitudes in evaluating the presence of supportive persons. What this implies is that the presence of a supportive network is needed. Nurses may need
to educate supportive people concerning patients' sleep needs during hospitalization.

**Implications for Further Research**

Helping patients to adapt to normal sleep patterns during hospitalization is important in nursing care. Replication of this research is highly recommended to attempt to discover the validity of the conceptual framework. If any significant data are obtained, appropriate nursing care can be developed for improving sleep for hospitalized patients. Some recommendations for further research follow.

The first recommendation is to clearly and accurately define the concept of social support. Since social support is not a unitary concept, it is very important to define an appropriate concept of social support which is related to health outcomes, and to apply a valid instrument to measure the concept of social support. Instead of only using the presence of supportive persons as the measurement of the concept of social support, the evaluation of perceived support may be added to measure social support as well.

Replicating this study with a larger sample size in both supported and unsupported groups is the second recommendation. Because the study was done in a limited period of time and at only two sites, the data might be skewed. For further study, broadening the sample size in increasing both the number of sites and the time period is recommended to gain more objectivity and more trustworthy data.
The third recommendation is that all participants receive an explanation of the correct way to complete the research instruments. It is very important to fill out the forms correctly, otherwise the data obtained may be inaccurate.

**Summary**

In this chapter the results of the study have been discussed. The reason why the conceptual framework was not upheld by the data gathered in this study was explained as the inappropriate measurement of the concept of social support. This researcher believes that the data show that the presence of social network membership was not found to be equivalent with acquiring benefits of support. Data also indicated that presence of support may dilute the effects of support by introducing other elements.

The significant difference found between the two groups (supported and unsupported) in terms of the attitudes about the presence of supportive persons to adaptation to sleep by hospitalized patients was explained as multidimensional concepts of social support. Patients in the unsupported group might evaluate perceived social support heavier than the presence of social network.

Patients in the group supported by friends got the best sleep rather than patients in the other two groups (spouse and relative groups). This may be related to other elements in the social network which decrease the effect of the support received.

Limitations that were addressed were a) inappropriate measurement of social support, b) the small sample size for both
supported and unsupported groups, and c) subjects' misunderstanding of the correct method of completing the research instrument.

Since there were unexpected results obtained from this research, it was inappropriate to draw any conclusions for the implications for nursing practice now. Several recommendations were suggested concerning further research. The first was a concise definition of social support, and a valid measurement of the concept of social support. The second recommendation was to broaden the sample size, to increase the amount of time covered by the study and the number of sites used. A further recommendation was to include education for all subjects regarding the correct manner of completing the instruments. Such education would decrease the number of errors and discrepancies in the data.
APPENDIX A

DEFINITION OF SLEEP CHARACTERISTICS ON VERRAN AND SNYDER-HALPERN (VSH) SLEEP SCALE

Mid-Sleep Awakening (MSA): The number of awakenings during the sleep period.

Wake after Sleep Onset (WASO): Estimate of amount of time spent awake during the total sleep period (TSP).

Movement during Sleep (MDS): Subjective estimate of the amount of movement during sleep.

Sleep Latency (SL): Estimate of the amount of time from settling down to sleep until falling asleep.

Soundness of Sleep (SS): Subjective estimate of sleep depth.

Quality of Disturbance (QD): Subjective estimate of sleep disturbance due to awakenings.

Quality of Latency (QL): Subjective estimate of difficulty in going to sleep.

Rest upon Awakening (RUA): Subjective estimate of how rested the person is upon awakening.

Subjective Quality of Sleep (SQS): Individual estimate of sleep time along dimensions of satisfaction, quality and disturbance in sleep.

Total Sleep Period (TSP): Estimate of total time from settling down for sleep to awakening in the morning (TST + WASO).
Total Sleep Time (TST): Estimate of amount of time spent in actual sleep during the total sleep period (TSP).

Wake after Final Arousal (WAFA): Estimate of time in bed from initial morning arousal to final awakening.

Sleep Sufficient Evaluation (SSE): Estimate of adequacy of amount of sleep.

Daytime Sleep (DTS): Estimate of time asleep during the morning and the afternoon other than primary sleep period.

AM Sleep (AMS): Estimate of time asleep during the morning other than the primary sleep period.

PM Sleep (PMS): Estimate of time asleep during the afternoon other than the primary sleep period.
TO: Tsu-Ching Shang  
Graduate Student  
College of Nursing

FROM: Ada Sue Hinshaw, PhD, RN  
Linda R. Phillips, PhD, RN  
Director of Research  
Chairman, Research Committee

DATE: December 9, 1965

RE: Human Subjects Review: Description of Sleep Characteristics in Hospitalized Adults in Taiwan as Related to Relatives or Friends Staying as Companions

Your project has been reviewed and approved as exempt from University review by the College of Nursing Ethical Review Subcommittee of the Research Committee and the Director of Research. A consent form with subject signature is not required for projects exempt from full University review. Please use only a disclaimer format for subjects to read before giving their oral consent to the research. The Human Subjects Project Approval Form is filed in the office of the Director of Research if you need access to it.

We wish you a valuable and stimulating experience with your research.

ASH/fp
APPENDIX C

ENGLISH AND CHINESE VERSIONS OF DISCLAIMER

Description of Adult In-Patients' Sleep Characteristics

Motives of this study are to understand the sleep-patterns of adult in-patients and to ascertain their relationships to the in-patients' relatives and friends. If you are willing to participate in this sleep-pattern study, please answer the following questionnaire about your hospital stay and personal information.

This questionnaire is in two parts. The first part deals with personal information which you can complete in no time. The second part is about sleep scale which must be completed within two hours after you got up in the next morning. It takes about fifteen minutes to answer the questionnaire which should be returned on the following morning.

This is an anonymous survey through a questionnaire. You need not give your name on it. Only the researcher knows your name. If you feel very strongly against answering questions which you do not like, just ignore them. Your answers would not in any way affect your relationships with your physicians, nurses and researcher.

This type of service through a questionnaire would not endanger or harm anybody's health.

Investigator: University of Arizona
College of Nursing
Graduate Student
Tsu-Ching Shang
台灣有親友陪伴的成年住院病人
其睡眠特質的描述

宣 告

這個研究的目的，是在了解成年住院病患的睡眠型態，
並探究患友與病患睡眠型態的關係。如果你願意參加
這個睡眠型態的研究，請回答下面有關你住院及個人資
料的問卷。

這份問卷分兩部份，第一部份是有關你自己個人資料
的問題。第二部份是睡眠評估表，這份評估表必須在你明
天早晨醒來後兩小時之內填寫完成。回答此份問卷約費時
15 分鐘，填寫完成的問卷，將於明天上午收回。

這是一個不記名的問卷調查，你的名字不會被記錄在
問卷上，只有研究人員知道有關你的資料。如果你有強烈
的意願，你可以不必回答你不想回答的問題。參與這個研
究沒有任何危險，而且，你可以在任何時間退出此研究。
不論你的決定或反應如何，都不會影響你和醫護及研究人
員之間的關係。

研究者：亞利桑那大學
護理研究所 研究生
尚 祥 鄒
APPENDIX D

ENGLISH AND CHINESE VERSION OF THE VERRAN AND
Snyder-Halpern Sleep Scale
VERSAN AND SNYDER-HALPERN SLEEP SCALE

Directions: Answer each question by placing a vertical mark across the answer line at a point which BEST reflects your opinion.

Example: Happy | Sad

Answer all of the following questions about your last night's sleep. Consider the night's sleep to begin from the time you first tried to go to sleep to the time you were finally "up" in the morning.

1. Did not awaken
2. I had no sleep
3. Did not sleep during the day yesterday
4. Did not sleep yesterday morning
5. Did not sleep yesterday evening
6. Fell asleep immediately
7. Slept lightly
8. Had no trouble with disrupted sleep
9. Didn't wake at all
10. Had no trouble falling asleep
11. Didn't move
12. Awake exhausted
13. After morning awakening, stayed awake
14. Had a bad night's sleep
15. I had enough sleep

Scale # (34)

---

9/34 (flavoured 2/15) (flavoured 8/16)
Verren 和 Snyder-Halpern 睡眠量表

提示：請在下列水平線上的適當位置，劃一個短的垂直線與水平線相交，以回答下面每一個問題。這個適當的相交位置最能表示出你的看法和意見。

例如：快樂——|——悲哀

根據你昨夜的睡眠來回答下面的問題。所謂昨夜的睡眠是指從你最初試圖入睡開始，一直到第二天早晨你真正爬起床為止。

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<td>(الف) 没有醒来過</td>
<td>醒了十小時</td>
<td>(35-37)</td>
</tr>
<tr>
<td>(ب) 没有睡</td>
<td>除了醒來的時間，有十小時的睡眠</td>
<td>(38-40)</td>
</tr>
<tr>
<td>(ب) 昨天白天没有睡</td>
<td>昨天白天睡了十小時</td>
<td>(41-43)</td>
</tr>
<tr>
<td>(ج) 昨天上午没有睡</td>
<td>昨天上午曾斷斷續續的睡</td>
<td>(44-46)</td>
</tr>
<tr>
<td>(ع) 昨天下午没有睡</td>
<td>昨天下午曾斷斷續續的睡</td>
<td>(47-49)</td>
</tr>
<tr>
<td>(ب) 立刻入睡</td>
<td>没有入睡</td>
<td>(50-52)</td>
</tr>
<tr>
<td>(1) 睡得很浅</td>
<td>睡得很沉</td>
<td>53-55</td>
</tr>
<tr>
<td>(2) 对处理被破坏的睡眠，不构成问题</td>
<td>对处理被破坏的睡眠，有很大的问题</td>
<td>56-58</td>
</tr>
<tr>
<td>(3) 没有醒来过</td>
<td>整晚断断续续的醒来</td>
<td>59-61</td>
</tr>
<tr>
<td>(4) 没有任何困难入睡</td>
<td>很难入睡</td>
<td>62-64</td>
</tr>
<tr>
<td>(5) 整晚没有动</td>
<td>整晚翻来翻去</td>
<td>65-67</td>
</tr>
<tr>
<td>(6) 醒来后觉得很累</td>
<td>醒来后觉得精神很好</td>
<td>68-70</td>
</tr>
<tr>
<td>(7) 早晨醒来后就没有再睡</td>
<td>早晨醒来后就断断续续的打盹</td>
<td>71-73</td>
</tr>
<tr>
<td>(8) 有很好的睡眠</td>
<td>有很好的睡眠</td>
<td>74-76</td>
</tr>
<tr>
<td>(9) 有足够睡眠</td>
<td>没有足够睡眠</td>
<td>77-79</td>
</tr>
<tr>
<td>(10) 我的亲友能帮助我在住院期间得到好的睡眠，我希望他们能留下来陪我努力反对</td>
<td>——</td>
<td>——</td>
</tr>
<tr>
<td>(11) 没有亲友的陪伴，在住院期间，我无法获得好的睡眠</td>
<td>極力反对</td>
<td>——</td>
</tr>
<tr>
<td>(12) 沒有亲友的陪伴，在住院期间，我無法獲得好的睡眠</td>
<td>——</td>
<td>——</td>
</tr>
</tbody>
</table>
APPENDIX E

ENGLISH AND CHINESE VERSION OF THE
SUBJECT INFORMATION QUESTIONNAIRE
**SUBJECT INFORMATION QUESTIONNAIRE**

*Directions: Please circle or fill in the one correct response.*

<table>
<thead>
<tr>
<th>Subject Number: ___________________</th>
</tr>
</thead>
</table>

1. **What is your sex?**
   - A. Female
   - B. Male

2. **What is your age?**

3. **What is your marital status?**

4. **What are your normal sleeping hours?** __________ to __________

5. **During the last two months, has your illness led to sleep loss or disruption in your normal sleep times?**
   - YES
   - NO

6. **Do you have any routine assistance for achieving sleep; e.g., a radio, TV, reading, etc. If YES, please list below:**
   - YES
   - NO

7. **Have you worked a night shift with daytime sleeping within the last two months?**
   - YES
   - NO

8. **Are you planning to work the night shift and sleep during the day within the next two months?**
   - YES
   - NO

9. **In your opinion, are you currently experiencing any stress which might disrupt your normal sleep patterns?**
   - YES
   - NO

10. **Select the ONE option which most accurately reflects your employment status:**

    - □ 1. Full-time student
    - □ 2. Full-time employment
    - □ 3. Part-time employment
    - □ 4. Retired
    - □ 5. Unemployed

11. **Was there anyone staying with you last night?**

    - Yes
    - No

    *(If yes, please list the relationship e.g., father, spouse, friend, etc.)*
個案一般資料問卷

提示：請圈出”或“填入”一個正確的答案。

個案編號：

(1) 你的姓別是？1. 女性 2. 男性

(2) 你的出生年月日是？年 月 日。

(3) 你的婚姻情況是？1. 未婚 2. 已婚 3. 離婚 4. 分居

(4) 你平時的正常睡眠時間是自 到

(5) 在過去兩個月中，是否有任何疾病導致你失眠或破壞了你的正常睡眠時間？是 否

(6) 你是否需要任何例行的輔助才能睡覺，例如：收音機、電視、閱讀等？是 否

若你需要，請列出何種？

(7) 在最近兩個月中，你會否執夜班，而在白天睡覺？是 否

(8) 在未來的兩個月中，你是否計劃執夜班，而在白天睡覺？是 否

(9) 依你的看法，目前你是否正經歷任何壓力，這種壓力可能破壞你的正常睡眠型態？是 否

(10) 選出“一個”適當的答案，能代表你的身份？

1. 學生
2. 全時間聘僱
3. 部分時間聘僱
4. 退休
5. 無業

(11) 昨夜，是否有任何親友陪伴你？是 否

若有，請列出和你的關係如：父子、夫妻、叔姪或朋友等。
APPENDIX F

ENGLISH AND CHINESE VERSION OF THE SUBJECT INFORMATION QUESTIONNAIRE CHART FORM

SUBJECT INFORMATION QUESTIONNAIRE CHART FORM

SUBJECT NUMBER: __________________________

11. Day of Hospitalization: __________________

12. Day of Week: __________________________

13. Diagnosis: ______________________________


15. Sleeping medication night of study: YES NO
   Medication: ______________________________
   Dose: _____________________________________
   Time: _____________________________________

16. Hypnotics/Tranquilizers administered YES NO
   Medication: ______________________________
   Dose: _____________________________________
   Last Dose (before study night)
   Frequency of Dose (day before study night)

17. Chronic sleeper use: YES NO

(22-23)
(24)
(25-27)
(28)
(29)
(30)
(31)
個案特別資料問卷

個別編號：________________________

(1)住院日數：__________________________ (22-23)

(2)星期幾：__________________________ (24)

(3)個案診斷：__________________________ (25-27)

(4) 科別：1. 內科 2. 外科 (28)

(5)研究當晚有無服用安眠藥品：有____無____ (29)

藥名：__________________________
劑量：__________________________
時間：__________________________

(6) Hypnotics/Tranquilizer 的使用：有____無____ (30)

藥名：__________________________
劑量：__________________________
最後一次劑量：__________________________
使用次數：__________________________

(7) 習慣性安眠藥的使用：有____無____ (31)
REFERENCES


