CHAPTER 1

INTRODUCTION

Background and Significance of Research Problem

Fatigue is a universal complaint not only associated with most acute and chronic illnesses, but also with normal, healthy functioning and everyday life (Aaronson et al., 1999). Fatigue is such a complex, multicausal, multidimentional, nonspecific and subjective symptom that insight into this phenomenon is limited and hindered. As Tiesinga, Dassen, and Halfens (1996, p.51) stated, “Although fatigue is recognized as an extensive problem, it is still one of the least explained, understood and investigated of human responses”.

Fatigue is also a common complaint in employees. Approximately 20% of the working population report symptoms that fall under the concept of fatigue (Bültmann, Kant, Kasl, Beurskens, & Piet, 2002). Other surveys have reported prevalence rates of fatigue varying from 7% to 45%, depending on the instruments used and the applied cut off points (Lewis & Wessely, 1992). William (1999) reported that one of the most serious health-related problems at work was employee fatigue, which could lead to increased accidents and injuries, increased illnesses, and poor quality of life. In the nursing population, fatigue is also regarded as a long-standing problem (Taylor & Barling, 2004). Hardy, Shapiro, and Borrill (1997) reported that a higher level of fatigue was found in nurses compared to that in other groups, including ancillary staff, professional and technical staff, as well as administrative staff. Therefore, employee fatigue, especially fatigue in the nursing population, is a

significant problem that requires further investigation.

In China, several scholars have studied the fatigue situation in the nursing population. These investigations revealed that 91.27% to 98.87% of Chinese nurses had experience of fatigue (Xu, Zhang, Lin, Zheng, & Chen, 2005; Zhang, Luan, Gao, & Cao, 1993). Wang (2004) also proposed that nurses in China are prone to experience fatigue, a situation that merits attention not only from nursing managers but also from policy-makers. Furthermore, fatigue is a critical issue for Chinese nurses because it leads to other undesirable outcomes, such as medication errors, degradation in performance, decreased mental acuity, social problems and frequent requests to be removed from night shifts (Shi, Li, & Ma, 2001; Xu et al., 2005). Thus, a high prevalence of fatigue and its negative outcomes make the study of fatigue in Chinese nurses both interesting and significant.

Several Chinese nursing scholars have provided information that may help to explain why the prevalence of fatigue is so high among Chinese nurses. Holistic care is one of reasons accounting for fatigue in Chinese nursing population. Holistic health care considers the physical, emotional, social, economic, and spiritual needs of the patients, which requires nurses to become deeply involved in the field of human behavior (Cheng, 1998). The intense interaction with patients, as well as complex personal involvement and interaction with patients' families or significant others, members of the health team, administrators and the community at large, may produce fatigue in Chinese nurses (Li & Zhang, 2002; Xu et al., 2005).

Nursing shortage is a problem existing in Chinese nursing society (Li, 2006). Because of the nursing shortage, nurses are experiencing a high job demand, which has been viewed as a significant contributor to fatigue in Chinese nurses (Li, 2002; Li

& Zhang, 2002; Lv & Zhang, 2002; Xu et al., 2005). Turnover is another problem in the Chinese nursing profession (Cheng, Fang, & Jin, 2008; Wu, Zhang, & Gao, 2000; Yang, Wan, & Hou, 2006; Zhang & Zhang, 1994). Turnover could aggravate nursing shortage in China, then, contributing to a high job demand which can result in fatigue. (Lv & Lin, 2003). Moreover, Chinese society does not consider nursing work to be as important as that of physicians and nurses have a low socioeconomic status (Hong & Yang, 2004). These problems may result in high competition among nurses when opportunities for promotion occur. High competition may contribute to fatigue among Chinese nurses because it may threaten the interpersonal relations at work (He & Yang, 2005).

Additionally, there is rapid technological advancement, introduction of new medical equipment and use of various types of chemicals in the Chinese clinical setting. The noise of machines, coupled with nuclear radiation, unpleasant odors, and biological hazards are threats in the hospital environment. Exposure to hazards in hospital environments is prone to induce fatigue in Chinese nurses (Li, 2002).

Although fatigue is reported to be highly prevalent and has a large impact on Chinese nurses, there is still a lack of empirical of studies to investigate its causes. In order to gain a richer understanding and to develop proper interventions to reduce fatigue in Chinese nurses, factors influencing fatigue should be considered and studied. Based on the Job Demand Control model (Karasek & Theorell, 1990), a conceptual framework for a cohort study titled “Fatigue at Work” (Kant et al., 2003) and the results of previous empirical studies, the primary focus of this study was on the causes of fatigue that are related to work and are considered modifiable.

In the work context, the Job Demand Control Model (Karasek & Theorell,

1990) has been proposed to explain the underlying causes of fatigue in employees. In this model, job demand and job control were hypothesized to cause fatigue. A later addition concerning support at work broadened the model by including interpersonal relations with co-workers and supervisors. Karasek, Brisson, Kawakami, Houtman, and Bongers (1998) proposed that job demand, job control, and support at work were psychosocial characteristics of a job, which could predict job-related symptoms, such as fatigue.

A Maastricht cohort study titled “Fatigue at work” fits well with the work of Karasek and Theorell. In this study, the authors proposed the impact of work content, work condition, work relations, and perceptions of work on fatigue (Kant et al., 2003). Specific variables included psychological and physical job demand, decision latitude and skill discretion (job control), supervisor and co-worker social support, job dissatisfaction and hazards in working environments. In the cohort study, the definition of skill discretion and decision authority, which were the measures for work content, were very similar to the definition of job control in the Karasek’s model. Job dissatisfaction (the measure for perception of work), and exposure to hazards in work environments (the measure of working conditions) were not included in the model by Karasek and colleagues (1990). Supervisor and co-worker support (the measure for work relation in the Maastricht study) was included in both models.

There are some supports for combining the model of Karasek and Theorell (1990) and the work of Kant and colleagues (2003) into one conceptual framework. Previous empirical studies have verified that job demand, job control, and support at work are predictors of fatigue (Bültmann, Kant, Schroer, & Kasl, 2002; Bültmann, Kant, Van den Brandt, & Kasl, 2002; Eriksen, 2006; Jansseen & Nijhuis, 2004).

Exposures to hazards in work environments, and job dissatisfaction, have also been shown to influence the development of fatigue (Fang, 2007; Kant et al., 2003; Kristal-Bonch, Froom, Harari, & Ribak, 1996; Melamed & Bruhis, 1996). However, few studies have been conducted to verify the hypothesized relationship between fatigue and the above-mentioned variables in the nursing population.

There is some support for adding work schedule to a study of fatigue in nurses. Several research groups have proposed that shift work may be another work-related factor influencing fatigue because of frequent changes in schedule and disruption to circadian rhythms. Fatigue is frequently reported by nurses who work during nighttime hours (Shen et al., 2006; Winwood & Lushington, 2006; Xia et al., 2005).

Sleep quality, although not directly perceived as a work-related factor, has been identified as a major complaint of shift-workers (Rotenberg, Moreno, Benedito-Silva, & Menna-Barreto, 1998). Nurses who do shift work, especially night or evening shifts, are prone to sleep problems (Kunert, King, & Kolkhorst, 2007; Niedhammer, Lert, & Marne, 1994; Xia et al., 2005). Empirical studies have verified that poor sleep quality or disturbed sleep is a significant predictor of fatigue in nurses (Kunert et al., 2007; Ruggiero, 2003). Therefore, sleep quality is included in the present study.

Anxiety and depression are common psychological disturbances in shift workers (Costa, 1997; Prizmic, Vidacek, & Radosevic-Vidacek, 1995; Scott, Monk, & Brink, 1997). Nurses, especially those working during night time hours, may suffer anxiety and depression (Munakata et al., 2001). Some evidence supports that anxiety and depression are positively associated with fatigue in otherwise employees and

nurses (Libbus, Baker, Osgood, Phillips, & Valentin, 1995; Ruggiero, 2003; Theorell-Haqlow, Lindberg, & Janson, 2006; Zheng, Xie, & Xu, 2006). Therefore, anxiety and depression were also added to the present study to investigate the relation with fatigue.

Intershift recovery is included in the study because the relationships of chronic fatigue with intershift recovery and acute fatigue can provide an overall understanding of fatigue, and be useful for developing interceptive interventions.

In the proposed model, variables such as shift work, job demand, job control, support at work, and exposure to hazards in work environments are directly work-related factors perceived to influence fatigue. Other variables, including anxiety, depression, sleep quality, job dissatisfaction, and intershift recovery, are also closely associated with work and are likely to affect fatigue. Evidence also supported that variables including job demand, job control, support at work, and exposure to hazards in work environments, were influencing factors to variables such as anxiety, depression, sleep quality, job dissatisfaction and intershift recovery. Nevertheless, these variables have never been studied in one model in relation to fatigue, and therefore it is not clear how they interact with each other to produce fatigue. Thus, studying these variables in one model for predicting fatigue is both necessary and significant.

Moreover, previous models and studies regarding fatigue were designed to assess only direct effects on fatigue, and they were not designed to examine indirect effects. In addition, little is known about magnitude of effects and how these work to influence fatigue. As a result, appropriate interventions to manage fatigue cannot be designed. Furthermore, previous studies conducted in nurses were not intended to study acute and chronic fatigue at one time or to differentiate acute chronic fatigue

because there was a lack of existing fatigue measurement scales (Winwood et al., 2005). There has been a lack of research examining the effect of intershift recovery and acute fatigue on chronic fatigue. Research conducted on these relationships, however, is important for understanding how acute fatigue evolves into chronic fatigue and provides an overall understanding of fatigue, which is especially useful for developing appropriate interceptive interventions.

From the literature review focused on fatigue in Chinese nurses, there is no information regarding interaction between the above-mentioned factors and fatigue. In addition, there is no differentiation of acute fatigue and chronic fatigue. Hence, developing a model for predicting acute fatigue and chronic fatigue in Chinese nurses has a crucial role in expanding fatigue knowledge in the Chinese nursing population. The findings of this study can address the identified limitations of current knowledge regarding fatigue in Chinese nurses by enhancing the understanding of factors both affecting acute and chronic fatigue in Chinese nurses. Additionally, the findings show how these factors interact with each other to produce fatigue. This study, which investigated factors influencing acute and chronic fatigue respectively and examined the effects of acute fatigue and intershift recovery on chronic fatigue, is unique and differs from previous studies. This new knowledge serves as an important foundation for fatigue research development and will guide appropriate interventions to decrease both acute and chronic fatigue. In these ways, this study benefits Chinese nurses as well.fatigue and

Objectives of the Study

The objectives of this study are:

1. To examine the level of acute and chronic fatigue in Chinese nurses.

2. To determine the extent to which variables in the proposed model, including shift work, job demand, job control, support at work, and exposure to hazards in work environments, can explain acute fatigue in Chinese nurses.

3. To determine the extent to which variables in the proposed model, including shift work, job demand, job control, support at work, exposure to hazards in work environments, job dissatisfaction, sleep quality, anxiety, depression, intershift recovery and acute fatigue, can explain chronic fatigue in Chinese nurses.

Research Questions and Hypotheses

Research Questions

1. What is the level of acute and chronic fatigue in Chinese nurses?

2. To what extent do shift work, job demand, job control, support at work, and exposure to hazards in work environments explain acute fatigue in Chinese nurses?

3. To what extent do shift work, job demand, job control, support at work, exposure to hazards in work environments, job dissatisfaction, sleep quality, anxiety, depression, intershift recovery and acute fatigue explain chronic fatigue in Chinese nurses?

Research Hypotheses

The hypotheses derived from the hypothesized model are:

1. Shift work has a direct positive effect on sleep quality, job dissatisfaction, anxiety, depression, acute fatigue and chronic fatigue.

2. Exposure to hazards in work environments has a direct positive effect on job dissatisfaction, acute fatigue and chronic fatigue.

3. Job demand has a direct positive effect on sleep quality, job dissatisfaction, anxiety, depression, acute fatigue and chronic fatigue.

4. Job control has a negative direct effect on sleep quality, job dissatisfaction, anxiety, depression, acute fatigue and chronic fatigue.

5. Support at work has a direct negative effect on sleep quality, job dissatisfaction, anxiety, depression, acute fatigue and chronic fatigue.

6. Sleep quality has a direct positive effect on anxiety, depression and chronic fatigue, but a direct negative effect on intershift recovery.

7. Job dissatisfaction has a direct positive effect on anxiety, depression and chronic fatigue.

8. Anxiety has a direct positive effect on chronic fatigue.

9. Depression has a direct positive effect on chronic fatigue.

10. Intershift recovery has a direct negative effect on chronic fatigue.

11. Acute fatigue has a direct positive effect on chronic fatigue.

Scope of the Study

This study was conducted among the Chinese nurses who worked at the general hospitals in Chengdu city, Sichuan Province. Data collection was from August 2007 to October 2007.

Definition of Terms

Nurse refers to a person who graduated with a certificate from an approved

nursing education institution, and holds a registered nurse (RN) license granted by the Ministry of Health, P.R.China, and is currently working in a general hospital**.**

Fatigue is defined as a state of impairment and disinclination to undertake further non-work activities or job tasks. It includes acute fatigue and chronic fatigue. *Acute fatigue* refers to a lack of energy to engage with normal non-work activities as a direct consequence of previous working tasks; *Chronic fatigue* refers to an inefficient action pattern, declining interest, involvement and commitment, reduced concentration and negative emotions about one's work (Winwood et al., 2005). It was measured by the Acute Fatigue Subscale and the Chronic Fatigue Subscale derived from the Occupational Fatigue Exhaustion Recovery (OFER), which was originally developed by Winwood, Lushington, and Winfiled (2006) and translated into Chinese by the investigator.

Intershift recovery refers to the extent to which acute fatigue is perceived to have been recovered or dissipated by the time the next work shift is commenced (Winwood et al., 2005). It was measured by Intershift Recovery Subscale derived from the Occupational Fatigue Exhaustion Recovery (OFER), which was originally developed by Winwood, Lushington, and Winfiled (2006) and translated into Chinese by the investigator.

Shift work refers to a nurse's self-reported work schedule that includes day, night, and evening shift on a rotating basis. Shift work was an ordinal variable in the present study and measured by the number of night and evening shifts per month.

Job demand refers to the subjectively perceived psychological and physical requirements of the work (Karasek & Theorell, 1990). It was measured by the Job Demand Subscale derived from the Job Content Questionnaire (Karasek, 1985). The

Job Demand Scale was translated into Chinese by Sa, Liu, Li, and Na (2003).

Job control refers to the worker's ability to control his or her own activities and skill usages at the work (Karasek & Theorell, 1990). It was measured by the Job Control Subscale derived from the Job Content Questionnaire (Karasek, 1985). The Job Control Scale was translated into Chinese by Sa and colleagues (2003).

Support at work refers to an overall helpful social interaction available on the job from both co-workers and supervisors (Karasek & Theorell, 1990). It was measured by the Support at Work Subscale derived from the Job Content Questionnaire (Karasek, 1985). The Support at Work Scale was translated into Chinese by Sa and colleagues (2003).

Job dissatisfaction refers to an overall negative feeling that an individual has about her/his work. It was measured by the Job Dissatisfaction Scale (Karasek, 1985). The Job Dissatisfaction Scale was translated into Chinese by Cheng, Luh, and Guo (2003).

Exposure to hazards in work environments refers to nurse's self-report about the frequency of exposure to physical, chemical, and biologic hazards in hospital work environments. It was measured by the Exposure to Hazards in Hospital Work Environments Scale that has been modified from the Hospital Occupational Hazards Scale (Gillmore, 1990) and was translated into Chinese by the investigator.

Sleep quality is defined as a complex phenomenon that includes quantitative aspects of sleep, such as sleep latency, sleep duration, or number of arousals, as well as some purely subject aspects of sleep, such as depth or restfulness of sleep (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). It was measured by the Pittsburgh Sleep Quality Index (Buysse et al., 1989) and translated into Chinese by Liu and colleagues

(1996).

Anxiety refers to a subjective feeling of apprehension caused by an anticipation of internal or external threat, including affective, cognitive, behavioral and physiological elements. It is measured by the self-report Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown, & Steer, 1988). This instrument was translated into Chinese by Zheng and colleagues (2002), as well as Che and colleagues (2006).

Depression refers to a subjective mood of disturbance that includes somatic and cognitive symptoms, such as lack of pleasure, feeling of guilt, loss of appetite, and thoughts of death or suicide. It was measured by the self-report Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and translated into Chinese by Zhang, Wang, and Qian (1990).