CHAPTER III
RESEARCH METHODOLOGY

3.1   Study design

Cross-sectional descriptive study

3.2   Research site

Srinagarind Hospital (a teaching university hospital), Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

3.3   Study population

Study population was 712 registered nurses who worked at Srinagarind Hospital, Faculty of Medicine, Khon Kaen University in 2008. They composed of 678 female and 34 male nurses.

3.4   Sampling method and sample size

Simple random sampling was applied as the sampling method. The required sample size was determined using the following formulae. It was found that 248 registered nurses were required for the sample size.

$$n_0 = \frac{z_{1-\frac{\alpha}{2}}^2 \, pq}{d^2}$$

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

n_0 = required sample size for infinite population

n = required sample size for the study population of 712 registered nurses

α = alpha error = 0.05

$Z_{1-\frac{\alpha}{2}}$ = 95% confidence for conclusion = 1.96

p   = expected proportion of registered nurses with WMSD = 0.56 [62]

q   = expected proportion of the registered nurses without WMSD = 0.44

d   = acceptable error   = 0.05

N   = number of the study population = 712

3.5   Research instrument

This research involved an epidemiologic analysis of Thai registered nurse's WMSD, with data by means of an anonymous, self-reporting questionnaire.

For the symptoms of work-related musculoskeletal disorders, our questionnaire was based on modified the Nordic standardized questionnaire and similar investigations conducted among hospital nurses in various Asian countries [1, 61-63]. Our anonymous survey included demographic questions on topic such as age, sex, marital status, alcohol consumptions, tobacco-smoking habits, and the presence of regular period pain. Questions regarding workplace tasks and various other occupational factors were asked, including questions about departments of employment, number of patients' transfer of lift per shit, and the presence of excessive mental pressure during working hours, and whether medical advice have been sought or sick leave taken. The WMSD questions included an anatomical diagram with shaded areas, which focused on the on musculoskeletal disorder with respect to their occurrence over the previous 12 –month period and last 7 days. Body sites were divided into neck, shoulder, upper back and lower back, elbows, wrist/hand, hips/thigh, knees, ankle/feet parts.

The reliability of questionnaire has been tested by internal consistency of Cronbach's Alpha (0.71-0.83). The reliability and validity of Nordic standard's Questionnaire has been widely confirmed in all kinds of studies.

Cut-off points for some important working characteristics [61]

Table 5 Cut-off points for work mental demand

| Work mental demand	Strongly Agree (4)	Agree a Bit (3)	Disagree a Bit (2)	Strongly Disagree (1)
1. working demands good concentration				
2. working demands good memory				
3. working demands continuous concentration				
4. working demands strong responsibility				
5. not complicated, can accomplish task easily				
6. the work can be achieved without continuous concentration				

High mental demand

Explanation:

1. **High mental demand**: All answers of question 1-4 were "strongly agree" and all answers of question 5-6 were "strongly disagree"

2. **Low mental demand**: All answers of question 1-4 were not "strongly agree" and answers of question 5-6 were not "strongly disagree"

3. **Unclassified**: The answers of question 1-6 were not compatible with high or low mental demand

Table 6 Cut-off points for job control

| Job Control	Very Few (1)	A Few (2)	Moderate (3)	Very Much (4)
1. you are able to control various job-management				
2. you are able to deal with the important job				
3. you are able to handle time-management				
4. you can allocate task to working staff in the unit properly				
5. you can determine any task finished in time				
6. you participate in making policy and schedule in your work institute				
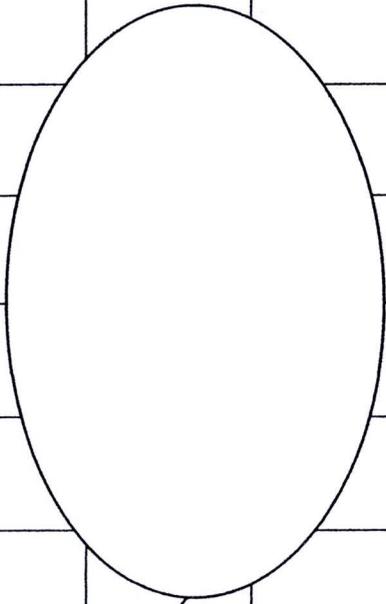
Low job control

Explanations:

1. **Low job control**: All answers of question 1-6 were "very few ", "a few" or "moderate"

2. **High job control**: The answers of question 1-6 were not compatible with low job control

Table 7 Cut-off points for social support

Social Support	Never (1)	Rare (2)	Sometimes (3)	Frequent (4)
1. supervisor is concerned				
2. friendly coworkers				
3. supervisor pays attention				
4. competent coworkers				
5. helpful supervisor				
6. helpful coworkers				
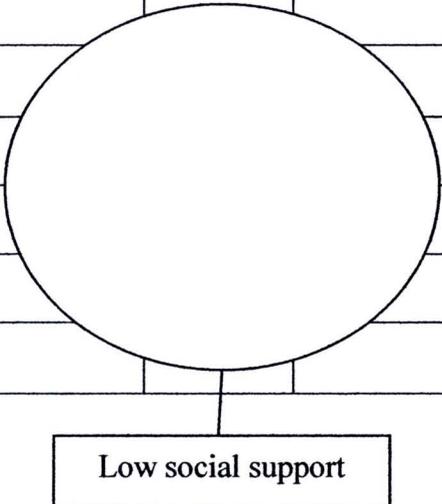
Low social support

Explanations:

1. **Low social support:** All answers of question 1-6 were "never", "rare" or "sometime"

2. **High social support:** The answers of question 1-6 were not compatible with low social support

3.6 Ethical considerations

This research was approved by ethical review committee of Khon Kaen University. The researcher asked permission to do the research from director of Srinagarind Hospital, informed registered nurses and related authorities about the research objectives, protocol and expected benefits. Participation in the research study was strictly voluntary. All participants were required to sign a formal consent document as a requirement of participation. Participants were able to quit at any stage for their preference. All collected data were treated as confidential and several strategies were taken to protect confidentiality of the data during processing. Publication and presentation of the data would be done in aggregation to prevent identification of any individual.

3.7 Data collection

Data will be collected by a set of self-administered questionnaire. These questionnaires comprises 4 section: demographic characteristics, work-related physical and psychosocial factors, self- recognition of severity of musculoskeletal disorders as well as assessment of 9 parts of body regions related to work-related musculoskeletal disorders in previous 12 months and latest 7 days.

The whole process of data collection will be done by 4 research assistants. They were trained on the protocol before and during data collection.

3.8 Data management

The collected data were checked for their completeness and correctness before the data analysis. Then they were coded and entered into computerized database. Double data entry was done then the computerized databases were validated using EpiInfo program for Windows version 3.5.1.

3.9 Data analysis

Frequency, proportion and percentage were used to describe qualitative variables. Minimum, maximum, mean & standard deviation or median & interquartile range were used to describe quantitative variables. Ninety-five percent confidence interval of proportion was used to extrapolate the event in the study population.

Pearson chi-square test, Fisher's exact test, linear-by-linear association and crude odds ratio were used to explore the association between WMSD and several qualitative variables while Mann-Whitney U test were used to explore association between WMSD and several quantitative factors, each factor at a time. Multiple logistic regression was used to analyze the association between WMSD and several factors simultaneously. A value of $p \leq 0.05$ on the two-sided test was considered statistical significance.