

# Burden of Diseases among Nursing Staff in a Tertiary Hospital in Thailand

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**Abstract:** Nurses form the majority of the workforce for health care systems globally, but they face challenges including high turnover and mal-distribution. As a result of heavy workload, they experience health problems and burnout. This cross-sectional study measured the impact of illnesses among nursing staff at a tertiary hospital in Thailand. In July 2015, 780 staff members of the nursing department including registered nurses, nurse assistants and patient assistants, were asked to complete two parts of self-reported questionnaires including demographic data and prevalence and incident of diseases occurring during 2014. The number of deaths was collected from the human resource department. Disability weights and disease duration were derived from the Thai Burden of Diseases study and international resources. The total disease burden was calculated using an organizational perspective based on the Disability-Adjusted Life Years.

Our results showed that total disease burden among nursing staff at the hospital in 2014 was 48.3 Disability-Adjusted Working Years. The Years of Working with Disability was 48.2% of total disease burden. The top three leading causes of disease burdens were ovarian cancer, 45.8% anxiety disorders 14.6%, and osteoarthritis 13.9%. Anxiety comprised the highest nonfatal cause which occurred mostly among younger nurses and those working in the inpatient wards. Cancer was the only fatal disease, incurring the largest burden, and accounting for 51.8% of total disease burden. Our finding raises attention to psychological conditions occurring among the young and inpatient wards and musculoskeletal disorders. It suggested that further investment to improve working conditions and support for nursing staff should be done. Moreover, patient handling and ergonomic training programs for nursing students could be included in the nursing curriculum, as well as refresher courses for employed nurses.

***Pacific Rim Int J Nurs Res 2019; 23(2) 180-193***

**Keywords:** Anxiety, Cost of illness, Disease burden, Hospital nursing staff, Mental disorders, Nurses

Received 1 March 2018; Accepted 31 July 2018

## Introduction

Nurses are the largest workforce contributors to health care in most countries. They face shortages, intention to leave their careers<sup>1</sup> and inequitable distribution.<sup>2</sup> This problem is being taken into account through strengthening the World Health Organization's global strategy for using health resources.<sup>3</sup> Despite

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this, a study concerning the relationship between the nursing shortage and work outcome revealed that the current shortage among nursing staff has resulted in a heavy workload for the remaining staff.<sup>4</sup> Therefore, this can directly cause stress and burnout and lead to low job satisfaction.<sup>4</sup>

Nursing professionals play a significant role in the health care system. Normally, they serve as primary and specialty care providers for patients, but nurses work under risky conditions or environments that incur needle stick and other penetrating injuries.<sup>5</sup> In addition, nurses work long hours and have to take care of patients regarding repetitive activities. This can result in nursing professionals experiencing work-related illnesses such as musculoskeletal disorders.<sup>6</sup> According to a study among registered nurses in Thailand, musculoskeletal diseases were the most common health problems followed by dyslipidemia, hypertension and viral hepatitis. Clinical nurses experienced insomnia and job strain more than nonclinical nurses.<sup>7</sup>

In Thailand, about 90% of nurses take care of patients, while 10% work in other fields such as education, research and management.<sup>8</sup> Approximately 15.4% of Thai nurses aim to leave their job and 11.2% plan to leave in the next 2 years.<sup>1</sup> A total of 3.3% leave the job before retirement age. Hospital management should place importance concerning these critical problems as well as burnout and heavy workload impact on the remaining nurses' health. One of the ways to support nursing staff is to take care of their health. This includes not only helping nursing staff to be healthy and work more efficiently but also saving the hospital health expenditures more effectively. However, we should select reliable indicators to measure the impact on their health to prioritize best practices in the hospital setting.

In the past decade, traditional population health indicators such as the number of death,<sup>9</sup> the incidence of illness, do not combine the impact of nonfatal outcomes of disease and illness conditions with the impact from early death. Disability-Adjusted Life Years

(DALYs) was first introduced in the Global Burden of Diseases (GBD) study conducted in 1993 to estimate the impact on both premature death and disability in a single unit as "time" allows comparison across population subgroups at the population level.<sup>10</sup> This summary measure of population health is helpful in priority-setting in the health sector as well as useful in evaluating the cost-effectiveness of interventions in terms of cost per unit of disease burden averted.<sup>9</sup>

However, to estimate the magnitude of health impact on nursing staff at working age, we modified the calculation of DALY to estimate the burden of disease based on an "organizational perspective", not a population perspective as in the GBD study. The burden of disease in the GBD study is calculated using the life expectancy at birth; 82.5 years for female and 80.0 years for men.<sup>9</sup> This may be an overestimate in an employer's point of view. So, in this study we captured only the impact of diseases that happened during the working period before retirement age. The objective of this study was to understand disease burden among nursing staff in a tertiary hospital using employer's perspective. The proposed measure combines disease burden from both mortality and morbidity into a single measurement unit. It can support organization design and management by comparing diseases across population groups, e.g., disease category, age groups, hospital ward and disease group. Moreover, this new measure can be used to assess the cost-effectiveness of interventions for prevention in the future.

## **Conceptual Framework and Literature Review**

Traditional population health measures were designed in a period when majority of health burdens were related to acute illnesses or diseases and so, their focuses were mainly on the incidence or prevalence of disease or mortality. For example, the number or incidence of death, is not practical for policy makers

these days because this does not consider non-fatal health outcomes which are more predominant in the age of chronic and non-communicable diseases.

Disability Adjusted Life Years (DALYs) is a concept to measure the health gap between an unhealthy population and a healthy population without disease. DALYs are population-based measures that combine the impacts of premature death and disability as a unit of measurement in the number of health year loss.<sup>9</sup> There are two related studies which applied the DALY concept to estimate the impact of diseases in working people including General Motors (GM)<sup>11</sup> and North American Industrial Classification System (NAICS) code 113310 in the LCA study.<sup>12</sup> Both studies calculated the disease burden using the life expectancy at birth of the population sampled. This may be an overestimate in the employer perspective because they might include the impact of elderly diseases while employees have worked in an organization until their retirement. However, little has been done to quantify the disease burdens of health workers.

This study used the concept of quality of life (QoL) and population health metrics similar to DALY. The main difference from DALY in this study is that it uses an organizational perspective. Based on the latter, as researchers we focused on the healthy time lost while in productive working years. Our measure considers the burden of disease to an organization by combining years of working with disability (YWD) and years of work lost (YWL) due to premature mortality before retirement age. It includes loss from any diseases or conditions that happened during employment. For example, when applied to nursing personnel it means any loss that occurred during the period from the start of work in the hospital until retirement age or between 20–22 until 60 years of age, a shorter time period than what is used in the calculation of DALYs.

**Aim of Study:** To understand disease burden among nursing staff in a tertiary hospital using the employer's or the organization's perspective.

## **Methods**

**Design:** A cross-sectional study.

**Sample and Setting:** This study is a part of a research study<sup>13</sup> which proposed to develop a new health measurement for an organization to understand their staff's health burdens. A public tertiary hospital in eastern Thailand was the study site. It was chosen based on being a referral hospital with a large number of staff and their willingness to participate in the study. The study population included all staff under the nursing department such as registered nurses, nurse assistants and patient assistant in any hospital units. Those joining the hospital after 2014 were excluded.

**Ethical Considerations:** Ethics approval (IRB no. 082/57) was granted by the Institutional Review Board, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand. Informed consent was collected from each participant before data collection. Participants' rights were explained to them verbally and their privacy was protected throughout the study

**Measures:** The self-reported questionnaire consisted of two parts including a demographic part and the prevalence and incidence of diseases among nursing staff.

*The demographic part:* this contains questions on gender, age, marital status, job level and year of work.

*The prevalence and incidence of diseases occurring during 2014:* This part of questionnaire was developed based on the list of diseases of the Burden of Disease Thailand.<sup>14</sup> The questionnaire was tested for content validity using 5 experts including 2 burden of disease experts and 3 epidemiology experts. The pilot test was conducted with 30 nursing staff in a general hospital. The results showed that the questionnaire was too long list of diseases especially the list of acute diseases. As a result, we separated diseases in two groups;

*The chronic diseases* consist of 14 diseases such as diabetes mellitus, ischemic heart disease, and

hypertension. Other chronic diseases are identified in open-ended questions. In each disease, nursing staff were asked question, “Has a doctor ever told you that you have ... (disease)...?” The answers could be 1= “yes” or 0= “no” for each disease, with additional answers on the year of diagnosis for chronic diseases and the health status for some disease such as diabetes mellitus.

The acute disease component was further stratified into 7 groups of disease including digestive system, respiratory system, musculoskeletal system, excretory system, cardiovascular system, reproductive system, and other acute diseases being identified in open-end question. Nursing staff were asked question, “Has a doctor ever told you that you have ... (disease)... during 2014?”. The answers could be 1= “yes” or 0= “no” for each disease, with additional answers on the frequency of having that acute disease during 2014 and the health status for some diseases such as diarrhea.

**Data Collection:** The project staff explain the purpose and processes of study before signing the consent form. Next, primary data was collected in July 2015 gathering individual’s information about diseases that occurred during the 2014 calendar year by using self-reported questionnaire. It took approximately 10 minutes to complete the questionnaire. In addition, the data on disability weights were from the GBD study.<sup>14, 15</sup> Data on estimated duration of disease for each disease stage and severity was derived from the disease burden working group Thailand (Thai BOD study).<sup>14</sup> The number of cause-specific deaths in the study site was retrieved from the hospital’s human resource department.

## Data Analysis

The analysis was based on DALY calculation as used in the 1996 GBD study which is the measurement of the sum of the impact from premature death and from disability in one single unit.<sup>9</sup> However, we

modified the calculation of DALY to estimate the burden of disease of nursing staff in this study to reflect organizational perspective. This was based on the employer’s point of view, focusing on the impacts of the diseases that the employees have in their organization known as Disability-Adjusted Working Year (DAWY). DAWY captures the magnitude of the disease burden among working-aged staff by considering only Years Working with Disability (YWD) and Years of Work Lost (YWL).<sup>13</sup>

YWD is calculated by multiplying the incidence of each disease by disability weight and duration of disease (F1).<sup>13</sup> For diseases of long duration, we counted as the YWD until retirement age. The YWD uses an incidence-based approach which catches the future health consequences of new cases occurring in the study year. The formula for calculating YWD<sup>13</sup> is:

$$\text{YWD} = \text{Incident} * \text{Disability weight} * \text{Duration of disease} \dots \text{(F1)}$$

Disability weights indicate social preference or utility towards specific health or disease conditions. Disability weight is valued between 0 and 1, where 0 means perfect health and 1 means death.<sup>9</sup> In our study we used disability weights from the disease burden working group Thailand (Thai BOD study), relying on the person trade-off (PTO) elicitation method. Note that comorbidity was not considered in this study and disability weight was used independently for each disease.

To calculate the YWD in this study; first, we categorized all diseases and conditions using the International Classification of Diseases and Related Health Problem 10<sup>th</sup> Revision (ICD-10). Second, incident cases of chronic diseases were enumerated only from the people whose disease first occurred in 2014. For incidence of acute diseases, we calculated it from the survey data using the number of nursing staff’s visits in 2014. Third, to calculate the weighted time spent in disability, incidence cases were multiplied by disease weight, reflecting the severity level of each disease, and the duration of disease. For chronic

diseases with a duration of illness longer than one year, we estimated the YWD using the time until retirement age of 60 years. This is the public-sector retirement age in Thailand. Fourth, the YWD were calculated for three specific age groups, i.e., 15–29, 30–44 and 45–60 years. Moreover, the YWD results were presented by disease category and hospital service units. In this study we classified hospital service units in 6 inpatient wards and 13 other hospital service units including the emergency room, occupational health unit, and the health insurance center. Each staff generally worked at one specific ward or unit. Those with administrative roles working in more than one unit and in our analysis, were assigned to ward or unit they spent the most time in.

YWL was calculated considering the number of years one nursing staff member would have lived until retirement age if they had not died prematurely.<sup>13</sup> Our calculation of YWL required multiplying the number of cause-specific deaths using the duration between retirement age and average age at death (F2) as the

remaining working years of a staff.<sup>13</sup> The YWL were presented by disease as shown below. Age weight or discounting was not applied in the calculation.

YWL = Cause-specific death \* (Retirement age – Age at death) ..... (F2)

## Results

### Sample characteristics

Of 780 nursing staff, 98 were excluded from the study due to their short period of employment. Six hundred and seven questionnaires were returned making a response rate of 89%. Most participants were female, married and aged 30 to 44 years. Mean age was about 40 years. About two thirds of participants were registered nurses after that were patient assistant and nurse assistant, respectively. The average length of work was 15 years. Basic characteristics of the respondents are shown in **Table 1**.

**Table 1** Sample Characteristics

General data	Questionnaire (N=607)	
	Number	%
Sex		
female	577	95.1
male	30	4.9
Age in years		
15–29	94	15.5
30–44	298	49.1
45–60.	215	35.4
Mean 40.7 yrs. Max. 60 Min. 21 SD = 9.5		
Marital status		
single	174	28.7
married	340	56.0
other	93	15.3
Job level		
registered nurse	418	68.9
nurse assistant	13	2.1
patient assistant	176	29.0
Average years of work (yrs.)	Mean 14.8 yrs. Max. 40 min. 1 SD=10.3	

## Illnesses and deaths in the study year

### Illnesses

Of diseases occurring among nursing staff in 2014, back pain, upper respiratory infection and dental caries were among the top three illness conditions as shown in **Table 2**. Regarding the prevalence of a comorbidity, 33.4% of nurses had a comorbidity while 43.2% of nurses had none.

### Deaths & Years of Work Lost (YWL)

As shown in **Table 2**, two deaths were caused from ovarian cancer at age 38 years and intrahepatic bile duct carcinoma at age 57 years. The premature mortality at work or YWL among nursing staff totaled 25 years in 2014. Ovarian cancer had the greatest

impact on YWL, accounting for 22.0 years or 88% while intrahepatic bile duct carcinoma accounted for 3.0 years or 12.0%.

### Years Working with Disability (YWD)

#### By disease

The YWD in 2014 totaled 23.3 years. The top ten leading causes of YWD are shown in **Table 2**. Anxiety, osteoarthritis and hypertensive heart disease were the leading causes of YWD in the nursing department in 2014, accounting for 30.3%, 28.8% and 15.8%, respectively. When we considered the causes by classification of disease, mental disorders and musculoskeletal diseases were the leading causes of YWD for nursing staff, accounting for 33.9% and 32.6%, respectively.

**Table 2** Top 10 diseases among nursing staff in 2014 by disease prevalence versus by Disability Adjusted Working Year

Prevalence	Disease	Prev. Rank	DAWY Rank	Disease	YWD	YWL	DAWY
153	Back pain	1	1	Ovarian cancer	-	22.0	22.1
108	Upper respiratory infection	2	2	Anxiety disorders	7.1	-	7.1
54	Dental caries	3	3	Osteo–arthritis	6.7	-	6.7
31	Hypertensive heart disease	4	4	Hypertensive heart disease	3.7	-	3.7
31	Peptic ulcer	5	5	Intrahepatic bile duct carcinoma	-	3.0	3.0
30	Diarrheal diseases	6	6	Diabetes mellitus	2.1	-	2.1
25	Diabetes mellitus	7	7	Tuberculosis	1.2	-	1.2
17	Osteo–arthritis	8	8	Back pain	0.9	-	0.9
13	Periodontal disease	9	9	Depression	0.8	-	0.8
11	Asthma	10	10	Dental caries	0.2	-	0.2

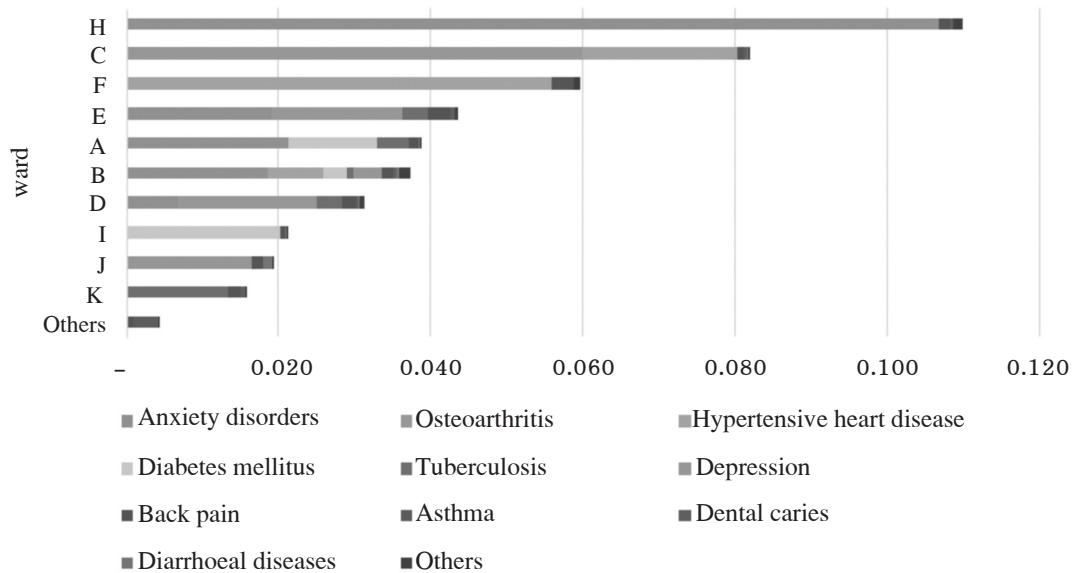
#### By ward

In consideration of YWD per person by ward, wards H, C, and F were the top three leading causes of YWD, accounting for 0.11, 0.08, and 0.06, respectively (see **Figure 1**). Anxiety disorders exhibited the highest health impact on most service units especially those with high workloads such as wards H, E, A, B and D. Osteoarthritis was the first and second leading cause of YWD in wards C, E, and D. Hypertensive heart disease was the first and second leading cause of YWD in wards C, F and B.

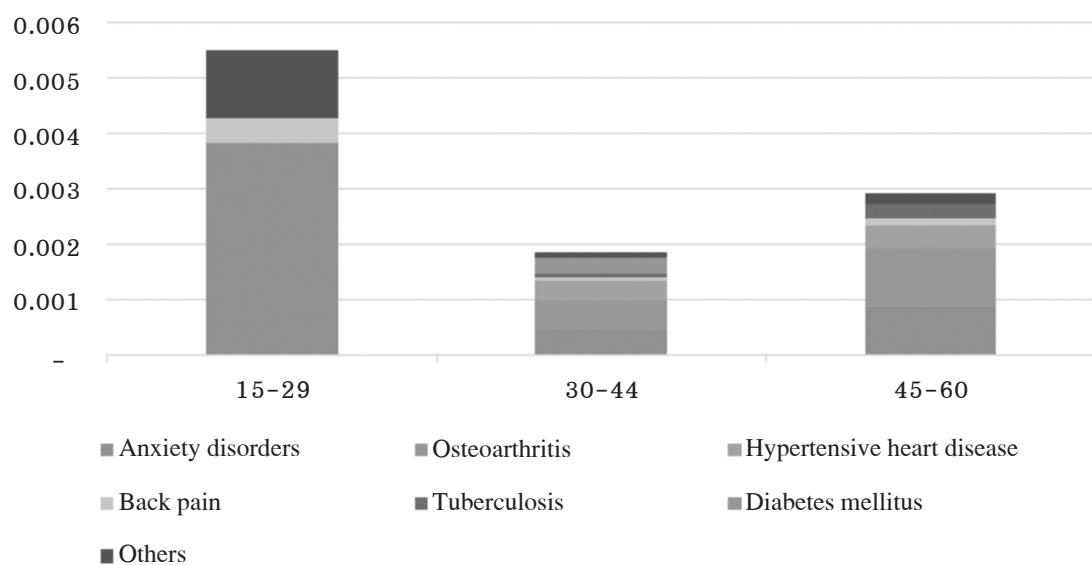
#### By age group

**Figure 2** shows the YWD per person by age group. The YWD was highest in age group 15 to 29, accounting for 0.0055, followed by age group 45 to 60 and 30 to 44, accounting for 0.0029 and 0.0018, respectively. Anxiety was the highest leading cause in age group 15 to 29. The top three leading causes of YWD for other age groups were the same, i.e., anxiety disorders, osteo–arthritis and hypertensive heart disease.

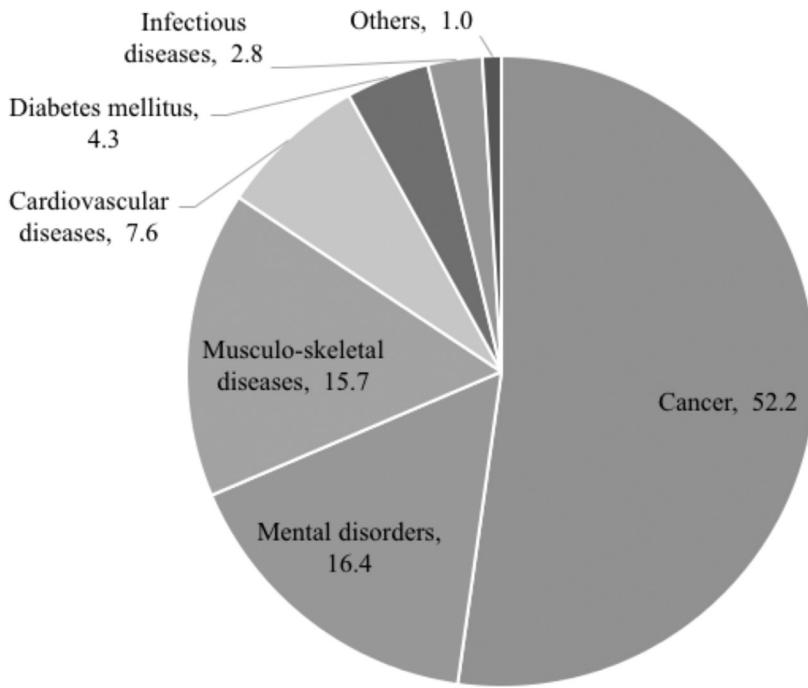
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**Figure 1** Top 10 leading causes of Years Working with Disability (YWD) by disease and ward



**Figure 2** The leading causes of Years Working with Disability (YWD) by disease and age group



**Figure 3** Proportion of total Disability Adjusted Working Years (DAWYs) for all staff by disease

#### The burden of diseases by disease and by disease group

The total disease burden of nursing staff including register nurse, nurse assistant and patient assistant from organizational perspective in 2014 totaled 48.3 DAWYs as shown in Table 2. The YWD or nonfatal outcome of diseases accounted for 48.2% of total DAWYs. The top three leading causes of the disease burden were ovarian cancer, 45.8%, anxiety disorders, 14.6% and osteo-arthritis, 13.9%.

Considering the DAWYs by disease group as shown in Figure 3, the top three leading causes were cancer, mental health and musculoskeletal diseases, accounting for 52.2%, 16.4% and 15.7%, respectively. Only cancer was affected by mortality by changing from the sixth YWD disease group to the first leading cause of DAWY (YWL=25.0 yrs., YWD=0.2 yrs.).

#### Discussion

Disease burden of nursing staff in a public sector tertiary hospital in southeast Thailand in 2014, when calculated as DAWY, totaled 48.3 years. This was on average, around one month of health lost per person. The majority of the burden came from noncommunicable diseases (NCDs) and nonfatal diseases. Cancer was the only fatal disease which incurred the largest DAWYs, almost all from early deaths. Mental disorders were the leading cause of the disease burden for nonfatal diseases. They occurred mostly in age group 15 to 29 years especially among those working in inpatient wards.

The results of this study indicated that traditional approaches of measuring the disease burden only by looking at the prevalence of illnesses or the number of deaths fragmentally may underestimate the health impacts of many key diseases that contribute to health

and productivity lost. As a result, wrong priorities are used to set the health prevention and intervention strategies for hospital nursing staff. The differences can be easily seen in the change in ranking between the rank based on disease prevalence and the rank based on DAWYs (Table 2). Mental health and chronic diseases such as anxiety disorders, osteoarthritis, hypertensive heart disease, diabetes mellitus and tuberculosis moved up to the top fifth rank of YWD while the ranks of common diseases such as back pain, upper respiratory infection and dental caries declined. This was because the calculation of DAWY, particularly YWD, considers the pattern of each disease, which differ in severity and duration. Other diseases that have high impact on DAWY are those that resulted in deaths as in the case of ovarian cancer and intrahepatic bile duct carcinoma.

One interesting finding from this study was the significant contribution of anxiety in overall disease burden especially among younger staff. Patient care, decision making, high responsibility and organizational/structural change are common causes of anxiety among nurses. Younger nursing staff generally face higher workloads and stress from their daily roles in the workplace. They are assigned to high intensity wards and may not receive adequate supervision and support.<sup>16</sup> They are also hired as temporary staff before they receive a permanent position due to the restriction on civil service positions in the Ministry of Public Health. Stress is experienced from a major life transition from previously being a student with limited responsibility and family expectation.

Job stress and burnout is shown to be significantly associated with high turnover<sup>17</sup> and in Thailand, nurses employed between 1 to 5 years had the highest turnover rate.<sup>18</sup> Another study found that about 38.6% of nurses, aged 25 to 29 years, intended to leave and change to a job unrelated to nursing.<sup>8</sup> There could be several contributing factors including the lack of adequate training and orientation and proper deployment and support systems within

the organization. Relationships between nursing staff and their supervisors including medical doctors<sup>19</sup> could be considered a contributing factor. Our results suggest that hospital management should provide adequate investment in good human resource management systems with particular attention to new or younger nursing staff that may include an effective orientation to the organization, clear job delegation, improvement in working conditions and support systems and other supportive measures.

In the non-fatal disease group, musculoskeletal diseases were the leading cause of physical illness after mental disorders. This was consistent with earlier studies concerning health problems among nurses in Thailand and other countries where musculoskeletal diseases were the most common health problems.<sup>7, 20</sup> Osteoarthritis could be due to occupational related factors such as inappropriate or intensive work style and repetitive tasks.<sup>21</sup> The strenuous works or job required physical effort constituted the third highest risks of musculoskeletal disorders (Odds ratio = 1.6; 95% CI: 1.5 to 1.8).<sup>22</sup> Besides, a meta-analysis study among hospital nurses and nursing aides showed that musculoskeletal disorders associated with psychosocial risk factors such as high psychosocial demands–low job control, effort reward imbalance, and low social support<sup>23</sup> Better occupational health support and training may be warranted. From recent systematic reviews about interventions to prevent and decrease musculoskeletal disorders among nurses between 2004 to 2016, it was found that most studies were of limited quality and they focused on patient lift systems and multi-component interventions include ergonomic program, patient handling, patient lifting, stress management and stretching exercise.<sup>6, 20</sup> High quality studies showed that unstable shoes,<sup>24</sup> stretch exercise,<sup>25</sup> and combining manual handling and ergonomics training<sup>26</sup> reduced pain and disability among nurses. Moreover, a study in the United States found that the knowledge of nurse educators and students could improve significantly with the inclusion

of safe patient handling and movement in the nursing school curriculum.<sup>27</sup>

The burden from other non-communicable diseases such as hypertension and diabetes mellitus are similar to what we see in the general public and are more likely the result of lifestyle and consumption behaviors. Job stress and burn out could be a contributing factor to this.

Our findings regarding the nursing staff are not totally different from the disease burden among the general female population of working ages as presented by the disease burden working group Thailand (ThaiBOD study); Depression, diabetes mellitus, and osteoarthritis were among the top three diseases in the age group 30 to 59 years for Thai females.<sup>28</sup> These three diseases were also among the top ten disease burden in our study.

One major difference is that the Thai BOD study showed that anxiety was not in the top-ten disease burden rank for 30 to 59 years old Thai females and it was in the fifth rank for those females 15 to 29 years old.<sup>28</sup> Our study, however, has anxiety in the second rank. This may be because hospital nurses have to cope with several major workplace stressors including workload, difficult relationship with other clinical staff, emotional needs of patients and their families, and shift working.<sup>16</sup>

The burden from road accidents among the nurses was much lower than those shown in the national statistics. This is likely because they mostly live in the hospital compound where a dormitory is provided. Because most of nursing staff are women and they have night shift work. Hospitals generally provide accommodation in the hospital areas to support shift work. In our study hospital, about 59 percent of the unmarried nurses stay in the residences provided within the hospital area. Furthermore, the study hospital has the reducing road accident policy. If nurses violent traffic law, it effects to their credit to promotion.

Even though mental illnesses were the second ranked in terms of DAWYs, it may still be underestimated for two reasons. First, because of stigmatization, it may be underreported in our self-reported questionnaires.<sup>29</sup> In another study that used self-reported surveys of mental health, about 36% of respondents underreported their conditions compared with medical records.<sup>30</sup> Second, they may be the root causes of other illnesses that were not properly investigated or diagnosed.<sup>29</sup>

In this study, dental caries ranked the third in term of disease prevalence. However, it was low (about 8.9%) comparing with Thai working age population 35–44 years (approximately 35%).<sup>31</sup>

In this study, we did not use age weight as in the GBD study because we used the organizational perspective among only working-age staff. However, age weight is a social preference, which values the young and older ages less than working ages.<sup>9</sup> Age weights slightly differ at working-age, so we assumed that the year of health life of nursing staff is equal. in addition, age weight did not affect the disease rankings by broad cause group.<sup>9</sup> Moreover, DAWYs differed from DALYs in the GBD study in that no discounting was used because a number of people have argued that discounting should not be applied to future health gains or losses.<sup>32</sup> Furthermore, when comparing the DALYs with and without age-weight and discounting in a related study, the main change only in rank order were mental illnesses revealing a minimal difference.<sup>9</sup> According to the impact of changing discounting in the GBD study, the DALYs were affected by discounting significantly, but it affected the older and younger age groups.<sup>9</sup> Moreover, the life cycle assessment (LCA) was applied to DALYs to present the disease burden in the workplace. They thought that the timing of release, exposure or health effect is the same so the years of life lived in the past, present or future do not differ<sup>12</sup>.

## **Limitation**

The major limitation of this study was from the use of a self-reported questionnaire, for this could cause underreporting because of recall bias of participants, especially regarding the number of visits concerning acute disease and year of diagnosis in regards to chronic diseases. Moreover, the results may not be generalizable to the broader system, since the study participants were from one hospital only. Another problem was the misreporting of disease severity due to the lack of information or ignorance. It may have led to miscalculation of the disease burden from the use of incorrect disability weights. However, we expected the problem to be minimal given our study population comprised nurses possessing technical knowledge about illnesses and medical care.

In this study, we did not calculate the disease burden from comorbidity, i.e., when two or more disease conditions appeared together, occurring together with a primary disease.<sup>33</sup> This may have resulted in a conservative estimation of overall disease burden. However, our intention was to avoid double counting the burden when we calculated all combined comorbidities. Additionally, the target population of our study comprised working age staff having fewer comorbidities compared with the general population or the elderly, so any existing bias should be minimal.

## **Conclusions and Implications for**

### **Nursing Practice**

This study showed that the leading causes of the disease burden among nursing staff were cancer, mental related disorders and musculoskeletal diseases. The majority of the burden came from non-communicable diseases. Mental disorders such as anxiety occurred among young staff and staff working in the inpatient ward.

Our findings have several policy implications for nursing practice. First, the method to calculate disease burden using an organizational perspective could be a model for other hospitals or organizations to follow as it can help prioritize diseases and identify areas for further investment in health prevention and promotion interventions.

Second, hospital management and nurse managers should pay more attention to good management practice specially to provide adequate support to new or younger nursing staff to reduce stress and burnout. This may include development of a team support mechanism and building positive relationship between nurse staff and their supervisors. Improving work conditions, suitable working hours, appropriate remuneration, and effort reward balance are additional areas of nursing workforce management to be considered.<sup>19</sup> The Thailand Nursing and Midwifery Council's upcoming residency training program for recent graduates could be another opportunity to strengthen staff competency and support to reduce their work-related anxiety.

Third, interventions to prevent musculoskeletal disorders are necessary for nursing staff. Hospital management should invest not only on physical interventions such as stretching exercise<sup>25</sup> and patient handling<sup>26</sup> but also on psychosocial interventions.<sup>23</sup> Some of multi-component interventions such as ergonomic training and safety handling of patients could be considered and prepared among the nursing staff since they are in nursing schools.<sup>27</sup>

## **Acknowledgements**

We are grateful to the staff of the study hospital. We thank the Thai BOD study group for useful information. Financial support from the Thailand Research Center for Health Services System, Chulalongkorn University is highly appreciated.

## References

1. Sawaengdee K, Tangcharoensathien V, Theerawit T, Thungjaroenkul P, Thinkhamrop W, Prathumkam P, et al. Thai nurse cohort study: cohort profiles and key findings. *BMC Nurs.* 2016 15:10.
2. U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. National and regional supply and demand projections of the nursing workforce: 2014–2030. Rockville: Maryland; 2017.
3. International Council of Nurses. Nursing input strengthens WHO global strategy for health human resources. *International Nursing Review.* 2016 63(2):153–160.
4. Toh SG, Ang E, Devi MK. Systematic review on the relationship between the nursing shortage and job satisfaction, stress and burnout levels among nurses in oncology/haematology settings. *Int J Evid Based Healthc.* 2012 10(2):126–141.
5. Ongete G, Duffy FJR. The impact of occupational splash, sharps and needlestick injuries (SSNIs) on the quality of life of healthcare workers in a Kenyan university hospital. *Work.* 2018 59(1):103–119.
6. Van Hoof W, O'Sullivan K, O'Keeffe M, Verschueren S, O'Sullivan P, Dankaerts W. The efficacy of interventions for low back pain in nurses: A systematic review. *Int J Nurs Stud.* 2018 77:222–231.
7. Thungjaroenkul P, Sawaengdee K, Theerawit T, Tungcharoensathien V. Health Problems and Health Care Behaviors Among Registered Nurses in Thailand. *Journal of Health Systems Research.* 2016 9(1):49–60. (in Thai)
8. Sawaengdee K. Supply of Registered Nurses in Thailand. Nonthaburi: Ministry of Public Health, Bureau of Nursing Department of Medical Services; 2009. (in Thai)
9. Murray CJL, Lopez AD, World Health Organization, World Bank and Harvard School of Public health. The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Geneva: World Health Organization; 1996.
10. Bank TW. World development report 1993 investing in health. New York: 1993.
11. Friedman C, McKenna MT, Ahmed F, Krebs JG, Michaud C, Popova Y, et al. Assessing the burden of disease among an employed population: implications for employer-sponsored prevention programs. *J Occup Environ Med.* 2004 46(1):3–9.
12. Scanlon KA, Gray GM, Francis RA, Lloyd SM, LaPuma P. The work environment disability-adjusted life year for use with life cycle assessment: a methodological approach. *Environ Health.* 2013 12:21.
13. Lertpitakpong C. Applying quality of life concept to employee health assessment in the organization [Doctoral thesis]. Bangkok: Chulalongkorn University; 2016. (in Thai)
14. Burden of Disease Thailand. Summary Measures of Population Health workshop. 1st ed. Nonthaburi: International Health Policy Program; 2014. 171 p. (in Thai)
15. World Health Organization. Global burden of disease 2004 update: disability weights for disease and conditions. Geneva: WHO. 2004 [cited 2017 Sep 22]. Available from: [http://www.who.int/healthinfo/global\\_burden\\_disease/GBD2004\\_DisabilityWeights.pdf](http://www.who.int/healthinfo/global_burden_disease/GBD2004_DisabilityWeights.pdf).
16. Nayomi WVP. Workplace stress in nursing: a literature review. *Journal of Social Statistics* 2016 03(01):47–53.
17. Mosadeghrad AM. Occupational stress and turnover intention: implications for nursing management. *Int J Health Policy Manag.* 2013 1(2):169–176.
18. Jaiboon P, Chiangnangarm P, Kuhiriyarah P. The Proportion and causes of resignation of nurses from Srinagarind Hospital, Khon Kaen University. *Srinagarind Med J.* 2011 16(3):233–238.
19. Sarafis P, Rousaki E, Tsounis A, Malliarou M, Lahana L, Bamidis P, et al. The impact of occupational stress on nurses' caring behaviors and their health related quality of life. *BMC Nurs.* 2016 15:56.
20. Richardson A, McNoe B, Derrett S, Harcombe H. Interventions to prevent and reduce the impact of musculoskeletal injuries among nurses: A systematic review. *Int J Nurs Stud.* 2018 82:58–67.
21. Yucesoy B, Charles LE, Baker B, Burchfiel CM. Occupational and genetic risk factors for osteoarthritis: a review. *Work.* 2015 50(2):261–273.
22. Thinkhamrop W, Laohasiriwong W. Factors Associated with musculoskeletal disorders among registered nurses: evidence from the Thai nurse cohort study. *Kathmandu Univ Med J (KUMJ).* 2015 13(51):238–243.

23. Bernal D, Campos-Serna J, Tobias A, Vargas-Prada S, Benavides FG, Serra C. Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: a systematic review and meta-analysis. *Int J Nurs Stud.* 2015;52(2):635-648.
24. Vieira ER, Brunt D. Does wearing unstable shoes reduce low back pain and disability in nurses? A randomized controlled pilot study. *Clin Rehabil.* 2016;30(2):167-173.
25. Chen HM, Wang HH, Chen CH, Hu HM. Effectiveness of a stretching exercise program on low back pain and exercise self-efficacy among nurses in Taiwan: a randomized clinical trial. *Pain Manag Nurs.* 2014;15(1):283-291.
26. Jaromi M, Nemeth A, Kranicz J, Laczko T, Betlehem J. Treatment and ergonomics training of work-related lower back pain and body posture problems for nurses. *J Clin Nurs.* 2012;21(11-12):1776-1784.
27. Nelson AL, Waters TR, Menzel NN, Hughes N, Hagan PC, Powell-Cope G, et al. Effectiveness of an evidence-based curriculum module in nursing schools targeting safe patient handling and movement. *Int J Nurs Educ Scholarsh.* 2007;4:Article26.
28. Burden of Disease Thailand. Disability-Adjusted Life Year : DALY. The graphicco systema co., ltd: International Health Policy Program, 2013.
29. Vigo D, Thornicroft G, Atun R. Estimating the true global burden of mental illness. *Lancet Psychiatry.* 2016;3(2):171-178.
30. Bharadwaj P, Pai MM, Suziedelyte A. Mental health stigma. *Economics Letters.* 2017;159(Issue C):57-60.
31. Department of Health. 8th National Oral Health Surveillance. Nonthaburi: Ministry of public health. 2017 [cited 2018 May 7]; Available from: [https://www.anamai.moph.go.th/ewt\\_news.php?nid=10623](https://www.anamai.moph.go.th/ewt_news.php?nid=10623).
32. World Health Organization. WHO methods and data sources for global burden of disease estimates 2000-2011. Geneva: World Health Organization, 2013.
33. Cohen A. Addressing comorbidity between mental disorders and major noncommunicable diseases Denmark: World Health Organization, 2017.

## ภาระโรคของกลุ่มการพยาบาลในโรงพยาบาลระดับติดภูมิแห่งหนึ่งในประเทศไทย

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**บทคัดย่อ:** กลุ่มการพยาบาลถือเป็นกำลังคนหลักในระบบบริการสุขภาพ ซึ่งต้องเผชิญกับปัญหาการลาออกและการระจากมีความเหลื่อมล้ำในแต่ละพื้นที่ ทำให้ต้องทำงานหนักและต้องเผชิญกับปัญหาสุขภาพและความเห็นอุยล้า การศึกษาแบบบัดดี้ของครั้งนี้จึงทำการวัดผลกระทบของการเจ็บป่วยในกลุ่มการพยาบาลของโรงพยาบาลในระดับติดภูมิแห่งหนึ่งในประเทศไทย เดือนกรกฎาคม พ.ศ. 2558 กลุ่มการพยาบาลจำนวน 780 คน ในฝ่ายการพยาบาลซึ่งประกอบด้วย พยาบาลวิชาชีพ ผู้ช่วยพยาบาล และผู้ช่วยเหลือผู้ป่วย ตอบแบบสอบถามแบบตอบด้วยตนเองซึ่งประกอบ 2 ส่วน ได้แก่ ข้อมูลด้านประชากร ความชุกและอุบัติการณ์ของโรคต่างๆ ที่เกิดขึ้นในระหว่างปี พ.ศ. 2557 ข้อมูลการตายรวมจากฝ่ายทรัพยากรบุคคล ค่าถ่วงน้ำหนักความพิการและระยะเวลาของโรคได้จากการศึกษาภาระโรคของประเทศไทยและแหล่งข้อมูลต่างประเทศ ภาระโรคทั้งหมดประมาณค่าโดยใช้การการสูญเสียปีสุขภาวะในช่วงทำงานในมุมมองขององค์กร ที่พัฒนาจากแนวคิดการสูญเสียปีสุขภาวะ

ผลการศึกษา พบว่า ภาระโรคทั้งหมดของกลุ่มการพยาบาล ณ โรงพยาบาลแห่งนี้ ปี พ.ศ. 2557 มีค่า 48.3 ปี ปีที่อยู่ด้วยการเจ็บป่วยในขณะทำงานคิดเป็นร้อยละ 48.2 ของภาระโรคทั้งหมด โรค 3 ลำดับแรกที่ทำให้เกิดภาระโรคมากที่สุด ได้แก่ โรคมะเร็งรังไข่ร้อยละ 45.8 โรควิตกกังวลร้อยละ 14.6 และโรคข้อเสื่อมร้อยละ 13.9 โรควิตกกังวลเป็นโรคที่ทำให้เกิดการสูญเสียมากที่สุดในกลุ่มโรคที่ไม่ทำให้เกิดการตาย ส่วนใหญ่เกิดขึ้นในกลุ่มพยาบาลที่อายุน้อยและอยู่ในหอผู้ป่วยใน มะเร็งเป็นโรคที่ทำให้เสียชีวิตเพียงโรคเดียวที่ทำให้เกิดความสูญเสียมากที่สุดคิดเป็นร้อยละ 51.8 ของภาระโรคทั้งหมด ผลการศึกษาชี้ให้เห็นว่าควรให้ความสำคัญกับภาวะด้านจิตใจที่เกิดขึ้นกับพยาบาลอายุน้อยในหอผู้ป่วย ในและโรงพยาบาลล้ามเนื้อและกระดูก โดยควรมีการดำเนินการลงทุนในการพัฒนาสภาวะการทำงานและการให้การสนับสนุนสำหรับกลุ่มการพยาบาล นอกจากนั้นควรพิจารณาเพิ่มการเรียนรู้ด้านการยศาสตร์ และการเคลื่อนย้ายผู้ป่วยอย่างถูกวิธีโดยอาจบรรจุในหลักสูตรการฝึกอบรมทั้งในกลุ่มนักเรียนพยาบาล รวมทั้งหลักสูตรบทวนความรู้สำหรับพยาบาลที่ทำงานแล้ว

*Pacific Rim Int J Nurs Res 2019; 23(2): 180-193*

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