

# **The Workplace Health and Safety Needs and Possible Solutions for Health Care Workers in Emergency Departments of Taiwanese Hospitals**

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## **ABSTRACT**

The occupational health and safety (OHS) risks encountered by health care workers (HCWs) in hospitals are significant. A hospital workplace is rife with numerous occupational hazards, yet hazard exposure does not occur uniformly to all HCWs because these hazards are diverse, with multiple interacting risk determinants. Many attempts have been made to identify and minimise the risk of hazard exposure individually; however, an integrative approach to address such complex and interconnected determinants has rarely been considered in strategy development. It is important to acknowledge that the single risk factor approach cannot adequately address the workplace health and safety needs of HCWs, particularly for those working in emergency departments (EDs).

An ED is one of the riskier workplaces in hospitals because the nature of the work and complexity of workplace conditions produce great threats to the physical and psychological health of HCWs in the process of care delivery. HCWs in Taiwanese EDs are no exception. Unfortunately, current data about the workplace health and safety needs of ED HCWs in Taiwan remain unclear. This increases the difficulty of further effective improvement of occupational health and reduction of workplace risk for this group of workers. In such complex ED workplaces, a setting-based approach may be suitable to comprehensively understand and address the specific issues related to workplace health and safety among HCWs in Taiwanese EDs.

Integrative workplace health promotion (WHP) is a setting-based approach that has been acknowledged as a cost-effective and essential measure in promoting health and safety for workers. A successful integrative WHP program meets the needs of the relevant stakeholders in a workplace, and addresses the multiple determinants of workplace issues via its integrative approach. In the Taiwanese context, the implementation of WHP has been suggested to address the specific needs of the target population in order to achieve the best outcomes. Unfortunately, current programs of worksite health promotion in hospitals seem less responsive to the significant problems of hazard exposure among

HCWs, particularly for those working in EDs. Therefore, this study aims to investigate the workplace health and safety needs of HCWs in the EDs of Taiwanese hospitals and to determine possible solutions by applying the model of integrative WHP.

A cross-sectional study of EDs in Taiwanese hospitals was conducted to explore these concerns. In addition to the qualified health care professionals working in EDs, the research subjects were also recruited from other relevant stakeholders with an interest in workplace health and safety in EDs. The research design combined qualitative and quantitative methods to identify the workplace issues and explore the risk determinants for further development of possible solutions. The techniques of data collection included questionnaire surveys, focus groups discussions, in-depth interviews, workplace observations, and secondary data reviews. The qualitative data were analysed using thematic analysis, while the quantitative data were analysed using descriptive statistical analysis and Chi-square tests.

The findings of this study indicate that—aside from unhealthy behaviours, including smoking and drinking alcohol—a high prevalence of work-related injuries and diseases affect the occupational health status of ED HCWs. Experiences of exposure to biological hazards, musculoskeletal injuries and mental health-related problems are common. In addition, job stress and workplace violence from patients or their family members were priority concerns for workplace health and safety in EDs. Concerning the workplace health and safety management in hospitals, some significant barriers and challenges to the efficiency of program implementation and outcomes in hospitals remain. These include the nature of the work, inadequate support from hospital management and problems of health program provision and access. Thus, an integrative approach for further strategy development was found necessary to deal with the workplace issues related to health and safety in EDs.

This study concludes that integrative WHP is feasible and essential for Taiwanese hospitals to meet the workplace health and safety needs of HCWs in EDs. The findings of this study contribute substantially to understanding the specific workplace issues related

to the health and safety of HCWs in EDs. In addition, it demonstrates the applicability of an integrative strategy to address multiple interacting determinants, which subsequently contributes to improving the practice of workplace risk management in hospitals. Finally, this study makes recommendations for future directions to address effective workplace health and safety improvement for HCWs in Taiwanese EDs.

## DECLARATION OF ORIGINALITY

*This work has not previously been submitted for a degree or diploma in any university.  
To the best of my knowledge and belief, the thesis contains no material previously  
published or written by another person except where due reference is made in the  
thesis itself.*

Signed:

Date:

# TABLE OF CONTENTS

<b>ABSTRACT.....</b>	<b>i</b>
<b>DECLARATION OF ORIGINALITY .....</b>	<b>iv</b>
<b>LIST OF TABLES .....</b>	<b>viii</b>
<b>LIST OF FIGURES.....</b>	<b>ix</b>
<b>LIST OF BOXES.....</b>	<b>x</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>xi</b>
<b>ACKNOWLEDGEMENT .....</b>	<b>xii</b>
<b>PUBLICATIONS .....</b>	<b>xiii</b>
<b>Chapter 1 Introduction .....</b>	<b>1</b>
1.1 Introduction.....	1
1.2 Background and Rationale.....	3
1.3 Aims of this study .....	6
1.4 Methodology and research plan .....	7
1.5 Structure of the thesis .....	8
1.6 Conclusion .....	9
<b>PART 1: LITERATURE REVIEWS .....</b>	<b>10</b>
<b>Chapter 2 Occupational Hazards among HCWs in Hospitals .....</b>	<b>10</b>
2.1 Introduction.....	10
2.2 Risk factors, consequences and interventions of common occupational hazards in hospitals.....	10
2.3 Current approaches in workplace hazard management: needlestick and sharps injury as an example .....	34
2.4 Conclusion .....	38
<b>Chapter 3 Issues of Workplace Health and Safety in EDs in Taiwanese Hospitals .....</b>	<b>40</b>
3.1 Introduction.....	40
3.2 Occupational injuries and diseases among HCWs and current interventions in Taiwanese hospitals.....	40
3.3 Challenges and difficulties in addressing OHS among HCWs in Taiwanese EDs ..	47
3.4 Conclusion .....	52
<b>Chapter 4 Setting-based Approaches to Improve Workplace Health and Safety .....</b>	<b>53</b>
4.1 Introduction.....	53

4.2 The concept of health promotion.....	53
4.3 WHP .....	58
4.4 Outcomes of WHP implementation in Taiwan .....	83
4.5 Conclusion .....	88
<b>PART 2: STUDY METHODOLOGY, FINDINGS AND DISCUSSIONS .....</b>	<b>90</b>
<b>Chapter 5 Conceptual Framework and Research Methodology .....</b>	<b>90</b>
5.1 Introduction.....	90
5.2 Rationale of research question.....	90
5.3 Conceptual framework of this study .....	91
5.4 Research aim and objectives .....	94
5.5 Research designs, data collections and analysis .....	94
5.6 Ethical issues.....	104
5.7 Conclusion .....	105
<b>Chapter 6 Profile of OHS Status among ED HCWs and Relevant Workplace Risk Factors .....</b>	<b>108</b>
6.1 Introduction.....	108
6.2 Reviewing government statistics of occupational injury and illness among health care participants .....	108
6.3 Self-reported occupational health status among HCWs in EDs .....	110
6.4 Workplace risk factors affecting OHS.....	122
6.5 The findings of ED workplace observation .....	128
6.6 Conclusion .....	130
<b>Chapter 7 Common Concerns about Occupational Hazards in ED Workplaces .....</b>	<b>132</b>
7.1 Introduction.....	132
7.2 The primary concerns about occupational hazards in EDs.....	132
7.3 WPV from patients or their family members .....	134
7.4 Job stress .....	142
7.5 Conclusion .....	153
<b>Chapter 8 Workplace Health and Safety Management in Hospitals .....</b>	<b>155</b>
8.1 Introduction.....	155
8.2 Health and safety programs for HCWs .....	155
8.3 Barriers and challenges to successful health and safety management .....	158
8.4 Importance of integrating various sources of data to identify workplace issues	170

8.5 Conclusion .....	171
<b>Chapter 9 Applying Integrative WHP to Address OHS among HCWs in EDs .....</b>	<b>173</b>
9.1 Introduction .....	173
9.2 SWOT analysis for workplace health and safety in Taiwanese EDs .....	173
9.3 The major workplace issues: identification and discussion .....	176
9.4 Risk determinants analysis and integrative strategy development for selected workplace issues of health and safety .....	187
9.5 Significance and limitations of the study .....	195
9.6 Recommendations of the study .....	196
9.7 Conclusion .....	200
<b>Chapter 10 Conclusion .....</b>	<b>202</b>
<b>Reference .....</b>	<b>210</b>
<b>Appendix A Checklists of Workplace Observation .....</b>	<b>238</b>
<b>Appendix B Ethical Clearance Certificate .....</b>	<b>239</b>
<b>Appendix C Certificate of Approval .....</b>	<b>240</b>
<b>Appendix D Healthy Workplace Questionnaire (Chinese vision) .....</b>	<b>241</b>
<b>Appendix E Healthy Workplace Questionnaire .....</b>	<b>247</b>
<b>Appendix F Guidelines for ED Workplace Violence Prevention .....</b>	<b>254</b>
<b>Appendix G Conference Publication .....</b>	<b>261</b>
<b>Appendix H Journal Publication .....</b>	<b>268</b>



## LIST OF TABLES

Table 4. 1	Benefits of a healthy workplace .....	65
Table 4. 2	A comparison of behaviourally driven health promotion and organisational approaches .....	68
Table 4. 3	The components of workplace profile .....	76
Table 4. 4	An integrative framework for evaluation and workplace needs assessment .	77
Table 5. 1	Participants for in-depth interviews (experts and key HCWs) .....	100
Table 5. 2	Numbers of focus groups and HCWs (N = 78) .....	101
Table 5. 3	Research matrix .....	106
Table 6. 1	Frequency of occupational injuries among workers of human health and social work services, by cause (2007-2011) .....	109
Table 6. 2	Frequency of occupational diseases among workers of human health and social work services, by cause (2007-2011) .....	110
Table 6. 3	Characteristics of the survey respondents (N = 326) .....	112
Table 6. 4	Frequency distribution of self-reported health status among respondents during the year prior to the survey being conducted (N = 326) .....	114
Table 6. 5	Frequency distribution of feelings about health and the job (N = 325) .....	117
Table 6. 6	Work-related injuries or diseases by personal variables .....	121
Table 6. 7	Relationships between absenteeism and work-related injuries or diseases among HCWs .....	122
Table 6. 8	Common concerns about workplace factors affecting OHS in EDs (multiple choice) .....	123
Table 6. 9	Associations between workplace factors and work-related injuries or diseases among HCWs (N = 322) .....	125
Table 6. 10	Logistic regression - risk factors related to occupational injuries or diseases .....	127
Table 7. 1	Summary comparisons of ED WPV prevention programs <sup>@</sup> in New Jersey and Taiwan hospitals .....	错误!未定义书签。
Table 7. 2	Associations between workplace issues and mental health-related problems .....	150
Table 8. 1	Levels of interest in participation in WHP among ED workers .....	157
Table 8. 2	Frequency distribution of common barriers to employing health plans (N = 323, multiple choice) .....	169
Table 9. 1	Workplace issues and sources of information by categories .....	177
Table 9. 2	Determinant analysis and strategy suggestion of WPV from patients or their family members.....	错误!未定义书签。
Table 9. 3	Determinant analysis and strategy suggestion of low compliance with the incident reporting procedures .....	191
Table 9. 4	Determinant analysis and strategy suggestion of heavy workloads resulting from ED overcrowding.....	193

## LIST OF FIGURES

Figure 2. 1 The OHS hierarchy of control .....	36
Figure 2. 2 Multiple interacting determinants and current measures to prevent exposure to blood-borne pathogens through needlestick or sharps injuries in hospitals .....	37
Figure 3. 1 Incident ratio <sup>1</sup> of nonfatal occupational injuries and illnesses among workers in human health and social work services in Taiwan (2005-2011) .....	41
Figure 3. 2 Profile of hospital medicine service visit by year .....	51
Figure 4. 1 A model of health determinants .....	55
Figure 4. 2 Determinants of workplace health .....	61
Figure 4. 3 An integrative strategy to address multiple determinants .....	64
Figure 4. 4 Four generations of WHP .....	67
Figure 4. 5 Workplace health model .....	70
Figure 4. 6 Planning and implementation cycle .....	73
Figure 5. 1 Conceptual framework of this study .....	93
Figure 5. 2 Overall research design of the study .....	96
Figure 5. 3 Techniques of data collection for the different types of needs assessment..	98
Figure 6. 1 Reasons inhibiting exercise (N = 185) .....	115
Figure 6. 2 Levels of perceived job challenge among participants (N = 324) .....	118
Figure 6. 3 Frequency distribution of plans to improve or maintain health (N = 325) ..	119
Figure 6. 4 Frequency distribution of the most common experiences of occupational injuries or diseases among participants.....	120
Figure 7. 1 Primary concerns about occupational hazards among HCWs in EDs (multiple choice, N = 321) .....	133
Figure 7. 2 The process of ED violence management .....	错误!未定义书签。
Figure 7. 3 Common workplace issues causing worry, nerves or stress (multiple choice) .....	142
Figure 7. 4 Frequency distribution for common methods of stress release .....	152
Figure 8. 1 Common health interests regarding WHP among HCWs (N = 326, multiple choice) .....	158
Figure 8. 2 Completion of an incident report by victims (N = 172).....	160

## LIST OF BOXES

Box 2. 1 Common risk factors of WPV in hospitals .....	错误!未定义书签。
Box 4. 1 Healthy workplace project in Shanghai, China .....	80
Box 4. 2 Good practice model of WHP in NIKE, Belgium .....	81
Box 4. 3 A successful program of WHP in the health care sector in British Columbia, Canada .....	82

## **LIST OF ABBREVIATIONS**

<b>BCG</b>	Bacille Calmette-Guerin
<b>BMI</b>	Body Mass Index
<b>CDC</b>	Centers for Diseases Control
<b>CT</b>	Computed Tomography
<b>ED</b>	Emergency Department
<b>ENWHP</b>	European Network for Workplace Health Promotion
<b>EPINet</b>	Exposure Prevention Information Network
<b>HCW</b>	Health Care Worker
<b>HP</b>	Health Promotion
<b>HPH</b>	Health-Promoting Hospital
<b>IOSH</b>	Institute of Occupational Safety and Health
<b>MSDs</b>	Musculoskeletal Disorders
<b>NHI</b>	National Health Insurance
<b>NIOSH</b>	National Institute for Occupational Safety and Health
<b>NOHSC</b>	National Occupational Health & Safety Commission
<b>OHS</b>	Occupational Health and Safety
<b>PCIs</b>	Percutaneous Injuries
<b>PPD</b>	Purified Protein Derivative
<b>PPE</b>	Personal Protective Equipment
<b>PTSD</b>	Posttraumatic Stress Disorders
<b>SARS</b>	Severe Acute Respiratory Syndrome
<b>SWOT</b>	Strengths; Weaknesses; Opportunities; Threats
<b>TB</b>	Tuberculosis
<b>VIP</b>	Very Important Person
<b>WHO</b>	World Health Organization
<b>WHO-WPRO</b>	World Health Organization-Western Pacific Regional Office
<b>WHP</b>	Workplace Health Promotion
<b>WPV</b>	Workplace Violence

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## PUBLICATIONS

Two publications have been developed from this thesis. My contribution to each co-authored paper included the initial concept and study design, data collection and analysis, and the writing of the whole papers. The papers are attached as Appendices G and H. The bibliographic details for these papers including all authors are:

Paper arising from Chapter 3:

Lin, L.-Y., Chu, C., & Bromwich, D. (2013). Occupational exposure to communicable diseases, violence and stress among emergency workers in Taiwanese hospitals - a literature review. Paper presented at the 2013 International Congress on Chemical, Biological and Environmental Sciences, Taipei, Taiwan.

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## **Chapter 1 Introduction**

### ***1.1 Introduction***

Occupational health and safety (OHS) among health care workers (HCWs) in hospitals is a significant concern for both workers and hospital managers. Due to the nature of this work, a complex variety of health and safety hazards—including biological, chemical, physical, ergonomic and psychosocial hazards—threaten the OHS of HCWs during their daily work (World Health Organization [WHO], n.d.b). The adverse effects of occupational exposure not only affect the health of individual workers (Gates et al., 2011; Karahan et al., 2009; Lawson et al., 2011), but also affect business operation in hospitals (Boden et al., 2012; Jackson et al., 2002; Pompeii et al., 2010). For these reasons, it is important for hospital managers to make efforts to minimise occupational hazard exposures for HCWs. Investigations into the causes of occupational exposure of HCWs to hazards have consistently indicated that occupational hazards are attributed to multiple interrelated determinants (Gillespie et al., 2010b; Golubic et al., 2009). For example, workplace violence (WPV) has often been induced by a combination of interrelated environmental and individual factors (Gillespie et al., 2010b). However, current workplace risk reductions for HCWs tend to address risk determinants individually, with little consideration of their interrelationships.

In addition, while the risk of occupational hazards in hospitals is significant, the problems of OHS among HCWs vary among different care units (Chiou et al., 2013). HCWs in emergency departments (EDs) are a particular group that requires greater attention paid to their OHS problems. In recent decades, issues of overcrowding (Bond et al., 2007), new communicable disease outbreaks (Chen, Cheng et al., 2005) and threats of biological and chemical terrorism (Greenberg et al., 2002; Wetter et al., 2001) have posed increasing challenges to the roles and functions of frontline health care in EDs. These work demands and work environment suggest that emergency HCWs may be more vulnerable to a variety of harmful hazards in the process of care provision. International studies indicate that emergency HCWs have significantly worse health and safety status than those working in other care units (Burbeck et al., 2002; Child & Mentis, 2010). Similar to EDs

around the world, HCWs in Taiwanese EDs may encounter threats to their physical and psychological health in their daily work. However, government statistics about work-related injuries and illness among HCWs do not distinguish between different groups of workers in human health and social work services (Taiwan Bureau of Labor Insurance, 2012). The scarcity of studies investigating workplace problems and risks in Taiwanese EDs increases the difficulty in understanding the specific issues related to workplace health and safety among this particular group of workers. Further, this may also affect the direction and efficiency of workplace interventions intended to promote health and reduce risk for HCWs. In this regard, a setting-based approach to address the specific issues related to workplace health and safety in Taiwanese EDs may be suitable.

The model of integrative workplace health promotion (WHP) is a setting-based approach to deal with specific issues related to health and safety in the workplace by addressing multiple interrelated determinants. Integrative WHP has been acknowledged as an effective and essential measure to improve organisational and working conditions, and encourage development of personal skills and lifestyles for health. Thus, it is undertaken as part of the workplace health and safety management to promote occupational health and minimise workplace risks (Chu & Dwyer, 2002; Western Pacific Region of WHO [WHO-WPRO], 1999). Studies have suggested that programs of WHP implemented in Taiwan must address the specific needs of the target population (Hsu, Lin et al., 2009; Huang et al., 2010). Unfortunately, the majority of WHP programs targeting HCWs in Taiwanese hospitals have tended to focus on lifestyle changes and individual physical health management (Lee, Chen & Chu, 2012). It is difficult to find evidence of worksite health promotion programs developed to respond to the specific needs of HCWs, particularly for those working in EDs.

This study aims to investigate the workplace health and safety needs of HCWs in Taiwanese EDs by applying the key features of the model of integrative WHP, as well as to provide recommendations for integrated strategies to address these issues. This chapter briefly introduces the background and rationale for the research question, the scope and



aims of this study, and the application of the methodology and research plan. It concludes by presenting the structure of the thesis.

## ***1.2 Background and Rationale***

### **1.2.1 Occupational hazards among HCWs in hospitals**

OHS among HCWs is a significant concern for both workers and hospital managers. Studies have continually indicated a significant prevalence of occupational hazard exposure among health care practitioners, including musculoskeletal disorders (MSDs), violence, stress and blood-borne pathogens (Bos et al., 2007; Chen & Jenkins, 2007; Child & Mentis, 2010; Dougherty et al., 2009). The subsequent effects of work-related injuries or diseases not only cause physical disability and mental illness in individual HCWs (Gates et al., 2011; Jaworek et al., 2010), but also affect hospitals in regard to compensation, work productivity, absenteeism (Boden et al., 2012; Pompeii et al., 2010) and staff recruitment and retention (Jackson et al., 2002). It is crucial to develop effective interventions to address hazard exposures in workplaces in order to ensure the best interests for both individual workers and hospitals.

In hospitals, current workplace interventions to address OHS among HCWs seem inadequate. Many researchers have acknowledged that the risk determinants causing the problems of OHS among health care practitioners are complex and interrelated (Gillespie et al., 2010b; Golubic et al., 2009). However, mainstream workplace interventions tend to address only one or two risk determinants (Luck et al., 2007; Lee et al., 2009; Lin et al., 2010), while ignoring their interrelationships. This significant gap suggests that an integrative approach to address multiple interacting risk determinants may be an effective way to solve the problems of OHS for health care practitioners.

The problems of OHS among HCWs in hospitals are different for different care units (Chiou et al., 2013). HCWs in EDs are at great risk of certain occupational hazard exposures, such as stress and violence. A study conducted in Singapore found that ED nurses reported a higher level of stress than general ward nurses (Yang et al., 2002).

Moreover, a Michigan study found that about three fourths of emergency physicians experienced at least one verbal threat. More than one fifth reported being victims of a physical assault (Kowalenko et al., 2005). Nevertheless, the causal relationship between the work characteristics in EDs and the prevalence of occupational exposure among HCWs has not been explored in depth. In response to the global concerns of OHS among emergency HCWs, it is essential to understand the specific work environment, job demands and common work-related injuries and diseases in EDs, particularly in the context of Taiwanese hospitals, for further development of successful strategies.

### **1.2.2 Issues of workplace health and safety in EDs in Taiwanese hospitals**

HCWs in EDs are one particular group that needs more attention to be given to their problems of OHS. An ED is a health care unit that provides frontline and multidisciplinary medical service for the public. However, the meaning of an ED to a HCW is a workplace with an unpleasant environment (Applebaum et al., 2010), excessive disruption and high unpredictability of clinical work (Hoff, 2008). In addition, there have been discussions in recent decades about EDs' specific work demands, such as overcrowding (Bond et al., 2007), direct contact with patients suffering from new communicable diseases (Chen, Cheng et al., 2005) and dealing with the victims of biological and chemical terrorism (Greenberg et al., 2002; Wetter et al., 2001). Such job demands and workplace conditions suggest that emergency HCWs may be more vulnerable to various hazard exposures in the process of care delivery.

EDs should be the priority care unit in Taiwanese hospitals when addressing workplace health and safety because of the high exposure to hazards. International studies have indicated that emergency HCWs have significantly worse health and safety status than those working in other care units (Burbeck et al., 2002; Child & Menten, 2010). This raises a concern about OHS among emergency HCWs in Taiwan. In addition, hospitals have received less funding after the National Health Insurance (NHI) programs implementation in Taiwan (Hsu & Wu, 2009). To survive in a competitive health care market, hospitals' management may be tempted to neglect or sacrifice the rights and wellbeing of health care practitioners in the effort to reduce costs. However, addressing a

healthy and safe workplace for HCWs in EDs is crucial in all Taiwanese hospitals because the quality of frontline care services is reliant on delivery by healthy HCWs.

Adopting an effective model of intervention to investigate and address the specific issues related to workplace health and safety is essential. Similar to EDs around the world, Taiwanese EDs are rife with various hazards that threaten the physical and psychological health of HCWs in their daily work. However, government statistics about work-related injuries and illness among HCWs do not distinguish between different groups of workers in human health and social work services (Taiwan Bureau of Labor Insurance, 2012). A scarcity of studies have investigated the problems of HCWs' health and safety resulting from the nature of job demands and working conditions of EDs in Taiwan. This has increased the difficulty in understanding the specific problems of OHS among this particular group of workers. Since an ED workplace is complex, a setting-based approach to investigate and address the specific issues related to workplace health and safety in Taiwanese EDs may be an appropriate measure.

### **1.2.3 Setting-based approaches for improving workplace health and safety**

The model of integrative WHP is a setting-based approach to prevent occupational injury and promote health for workers. A successful integrative WHP aims to prevent and manage physical and mental health problems, reduce workplace hazards, and address better quality and productivity of work. It is thus undertaken as part of workplace health and safety management (Chu & Dwyer, 2002). The experiences of many international cases have suggested that the key to successful WHP is an integrative approach to meet the needs of stakeholders, and reinforce the outcomes of OHS (European Network for Workplace Health Promotion [ENWHP], 2001; WHO-WPRO, 1999).

From the perspective of a setting-based approach, the model of WHP has not been well implemented in Taiwanese hospital settings. A hospital is regarded by the community, patients and employees as a setting with diverse roles and functions of health promotion (Pelikan et al., 2001; WHO-Europe, 2006). However, studies have found that projects of health promotion targeting HCWs have tended to focus on personal lifestyle changes to

address health issues related to obesity, metabolic syndrome and physical fitness, followed by management of individuals' abnormal health, such as hypertension and smoking cessation (Lee, Chen & Chu, 2012). Little attention has been paid to workplace hazard reduction. Although studies have suggested that programs of WHP implemented in Taiwan must address the specific needs of the target population (Hsu, Lin et al., 2009; Huang et al., 2010), it is difficult to find evidence of worksite health promotion programs developed to respond to the health and safety needs of HCWs in different care units by minimising exposure to hazards. In addressing the interests and wellbeing of HCWs, it is appropriate to apply the model of integrative WHP to improve occupational health and reduce workplace risk in Taiwanese hospitals, particularly in EDs.

### ***1.3 Aims of this study***

The purpose of this study is to apply the model of integrative WHP to address the issues of workplace health and safety among ED HCWs in Taiwanese hospitals. According to the *Regional Guidelines for the Development of Healthy Workplaces* suggested by WHO-WPRO (1999), a comprehensive workplace needs assessment is a crucial and initial step for the successful planning and implementation of programs. Thus, this study will focus on conducting a comprehensive needs assessment to identify the specific workplace issues and their determinants, and to provide recommendations for solutions. The results of this study can assist hospital managers, policymakers and practitioners of OHS in decision making and program design for an integrative approach to improve occupational health and safety among HCWs in EDs. Therefore, this research seeks to **investigate the workplace health and safety needs and possible solutions for healthcare workers in the emergency departments of Taiwanese hospitals** through a comprehensive needs assessment.

The specific objectives constructed to achieve the aim of the study are:

1. to examine the profile of OHS status among HCWs in EDs, and the relevant workplace risk factors

2. to investigate the common concerns of key stakeholders about occupational hazards in ED workplaces
3. to identify the challenges of implementing workplace health and safety programs in hospitals
4. to explore the applicability of the integrative WHP model to identify and analyse the workplace health and safety needs in EDs, and provide possible solutions
5. to make recommendations for future directions for the improvement of workplace health and safety for HCWs in Taiwanese EDs.

#### ***1.4 Methodology and research plan***

This is a mixed methods empirical study. A systematic workplace needs assessment requires both quantitative and qualitative research methods to identify the concerns of an ED workplace, explore causations and develop possible solutions. Hence, a variety of data collection techniques—including questionnaire surveys, in-depth interviews, focus group discussions, workplace observations and secondary document reviews—will be applied to ensure the data can provide comprehensive and objective evidence.

A cross-sectional study has been designed to approach the aims of the research. The research plan begins with a preliminary study to understand the problems of OHS among emergency workers in Taiwan, and enquire about the level of interest among hospital executives in supporting the study. During this stage, key stakeholders affected by the issue, or parties interested in workplace health and safety in EDs, were identified to participate in the questionnaire survey, group discussions and in-depth interviews. After data collection, this study applies descriptive statistical analysis and Chi-square and logistic regression tests for quantitative data, and thematic analysis for qualitative data. Three identified issues related to workplace health and safety are selected to serve as examples to test the applicability of an integrative WHP model for risk determinant analysis. Finally, drawing on five strategies suggested in the Ottawa Charter (WHO, 2010a), this study provides recommendations for integrative and feasible solutions to deal with the issues.

### ***1.5 Structure of the thesis***

This thesis consists of two parts. Part 1 focuses on the literature review of the common occupational risks among hospitals' HCWs in general, and the workplace health and safety concerns of Taiwanese EDs in particular, followed by a review of setting-based approaches to improve workplace health and safety. In Part 1, Chapter 2 discusses risk factors, consequences and interventions according to different types of occupational risks among HCWs in hospitals. Concerning the effectiveness of risk intervention, needlestick/sharps injury is selected as an example to examine current approaches and gaps in the management of hazard exposure in hospitals. Chapter 3 reviews the most common work-related injuries and diseases among HCWs in Taiwan. It also examines the special work characteristics of EDs and the potential influences of the health care environment in the Taiwanese context on OHS among HCWs in EDs. Chapter 4 introduces the concept of WHP that was initiated by WHO, and the rationale and successful applications of the model of WHP to reduce workplace risks and improve occupational health. It also discusses current practices of WHP in Taiwan, and analyses challenges and barriers to program planning and implementation in hospital settings.

Part 2 focuses on the methodology of this study, and the research findings, discussions and recommendations. Chapter 5 begins with the study's rationale, conceptual framework and research question. It describes the overall research design, and the process of conducting the study. This chapter also presents the details of research measures for quantitative and qualitative data collection and analysis. Chapter 6 examines the status of OHS among emergency HCWs and the relevant risk factors through reviewing the governmental statistics of occupational injury and disease among health care participants, and analysing the questionnaire survey about self-reported occupational health status among emergency HCWs. Chapter 7 presents the common occupational hazards in Taiwanese ED workplaces. Among these hazards, WPV from patients or their family members and job stress are considered in detail. Chapter 8 examines the current efforts to improve occupational health and reduce workplace risk for HCWs, as well as barriers to the design and implementation of programs in hospitals. The last chapter of this part identifies the major workplace issues related to health and safety in EDs, discusses the

main findings of this study with the existing literature, and identifies this study's new contributions to the literature and practice. Importantly, this chapter assesses the applicability of an integrative approach of WHP to address the issues of workplace health and safety. Finally, it also makes recommendations for future directions to improve workplace health and safety for ED HCWs in Taiwanese hospitals.

## ***1.6 Conclusion***

This chapter has provided an overview of this thesis. It briefly presented the background information of the research, and defined the research question and methodology. Three contextual fields were discussed: occupational hazards among HCWs in hospitals, issues of workplace health and safety in EDs in the context of Taiwanese hospitals, and setting-based approaches to improve workplace health and safety. Regarding the prevalence of occupational exposure among HCWs in hospitals, as well as a lack of integrative approaches to deal with the multiple interacting risk determinants, this study suggests that applying the model of integrative WHP to promote occupational health and reduce workplace risk for HCWs, particularly those working in Taiwanese EDs, may be useful. The next chapter presents an examination of the common occupational exposures to hazards among HCWs in general.

## **PART 1: LITERATURE REVIEWS**

### **Chapter 2 Occupational Hazards among HCWs in Hospitals**

#### ***2.1 Introduction***

A hospital is a health care institution providing medical treatment and promoting health for the public. For this purpose, HCWs are the most crucial asset in hospitals because their contributions to advanced care provision are irreplaceable. However, their work demands and workplace environment are characterised by a variety of occupational hazards—including biological, chemical, radiation, ergonomic and psychosocial hazards—that threaten their physical and psychological health (Chen, Cheng et al., 2005; Child & Menten, 2010; Perhats et al., 2012; WHO, n.d.b). The effects of poor OHS not only affect individual workers, but also have adverse effects on hospitals with respect to increasing compensation claims made by injured workers, reducing work productivity (Pompeii et al., 2010) and affecting staff recruitment and retention (Jackson et al., 2002). Although the effects of OHS among HCWs have been recognised, studies have continually indicated a high prevalence of work-related injuries and illnesses among this group of workers (Chen & Jenkins, 2007; Dougherty et al., 2009; Lee et al., 2010). This suggests that there is a need for a comprehensive understanding of occupational hazard exposure among HCWs. This chapter presents the current knowledge about common occupational hazards in terms of the risk factors and consequences of exposure. It also reviews and critiques the literature on the existing interventions to prevent or manage incidents of hazards exposure in hospitals. The final section of this chapter uses needlestick and sharps injuries as an example to explain the inadequacy of common suggestions and approaches in workplace hazard management.

#### ***2.2 Risk factors, consequences and interventions of common occupational hazards in hospitals***

A hospital workplace is rife with a variety of occupational hazards, including biological, chemical, ionising radiation, musculoskeletal and psychosocial hazards; however, hazard exposure does not occur uniformly for all HCWs due to diverse and interacting risk



determinants. To minimise risk, workplace interventions for different hazards have been implemented. This section examines the risk determinants, consequences and workplace interventions of the common occupational hazards in hospitals.

### **2.2.1 Biological hazards**

The risk of exposure of HCWs to biological hazards such as blood-borne pathogens is significant in the process of care delivery. In clinical practice, exposure to blood-borne pathogens has often occurred through needlestick and sharps injuries, and sometimes through the mucous membranes (Hills & Wilkes, 2003). According to the World Health Report in 2002, ‘37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) in HCWs around the world are due to needlestick injuries’ (WHO, n.d.c). Such significant data indicate that needlestick or sharps injuries remain a concern in protecting HCWs from exposure to blood-borne pathogens.

Diverse factors including risk behaviour, work environment/condition and organisational support lead to the occurrence of needlestick or sharps injuries among HCWs. In terms of the risk behaviours associated with needlesticks, there is some disagreement. A study investigating the prevalence of percutaneous injury in Taiwan hospitals found that recapping is the most dangerous behaviour and most common mechanism of needlestick injury among HCWs (Shiao et al., 2008). In contrast, a Korean study found that the actions of opening an ampoule or vial and disassembling needle kits were the most frequent cause of exposure incidents (Smith, Choe et al., 2006).

Despite these differing findings about the risk mechanisms, the determinants of working environment or condition certainly increase the risk of needlestick or sharps injury. Some special care units—including operation rooms, intensive care units and EDs—have high prevalence of incidents (Taiwan Institute of Occupational Safety and Health [IOSH Taiwan], 2008). However, the causal connections between work context and incidents have not been discussed in great detail. Concerning the question of devices in workplaces, hollow-bore syringe needles cause the greatest proportion of needlestick injuries (Ng et

al., 2002), and approximately 64% of those needles have been used on a patient (Smith, Smyth et al., 2006). This evidence indicates that protecting HCWs from occupational exposure is an urgent need because using needles to perform medical care is an intrinsic part of the daily work of nurses in particular.

The association between organisational factors and incidents of needlesticks/sharps injuries has been discussed in the literature (Clarke, Sloane et al., 2002). Clarke, Sloane et al. (2002) investigated the effects of organisational characteristics on the needlestick injuries of hospital nurses and found that nurses with poor leadership, weak resource support and great levels of emotional exhaustion were more likely to incur occupational exposure. Insufficient staffing and heavy workloads were also identified as contributing factors to needlestick injury in hospitals, causing an increase of 50% of the likelihood of injury to hospital nurses (Clarke, Rockett et al., 2002). The effects of other variables such as an individual's occupation (nurse or doctor) (Leigh et al., 2008), working mixed shifts (Smith, Mihashi et al., 2006) and work experience (Clarke, 2007) have been widely examined; however, due to varied research designs and study purposes, no consistent conclusions have been reached.

Alongside blood-borne infectious diseases acquired from work, communicable diseases by airborne pathogens, particularly tuberculosis (TB) and severe acute respiratory syndrome (SARS), are another form of biological hazard that threatens the health of HCWs. For decades, the transmission of TB in hospitals has been considered an occupational risk because ineffective control methods and failure to diagnose promptly have resulted in the infection of various HCWs (Charney & Fragala, 1999, p. 72). This may suggest why the prevalence of TB infection among health care practitioners is three times higher than that among the general population (Kilinc et al., 2002). In general, close and direct contact with people who have infectious TB or SARS increases the risk of infection (Hasselhorn et al., 1999, p. 93; Loeb et al., 2004). Loeb et al. (2004) examined the factors of SARS transmission in nurses and found a 6% probability of infection during therapeutic procedures, such as intubation and suction. Lau et al. (2004) did not find a significant risk in workers who performed high-risk medical procedures;

however, inadequate protective equipment supply, less than two hours of infection control training and inconsistent use of personal protection equipment (such as surgical or N95 mask, gloves and goggles) were suggested to be significant determinants of infection.

Reporting an incident of exposure to biological hazards among HCWs is important for OHS management in hospitals. Frequently, psychological stress is an immediate reaction after an incident due to a fear of contracting blood-borne or airborne diseases (Bai et al., 2004; Hills & Wilkes, 2003). Even so, the majority of such incidents are not officially documented in hospitals. The common reasons for underreporting among HCWs include being too busy, encountering excessive paperwork or believing there was no risk from exposure (Au et al., 2008; Kessler et al., 2011). In addition, issues about the health service provided by the organisation can affect workers' intention to report. For instance, Hills and Wilkes (2003) and Ko et al. (2011) suggested that service by untrained staff and lack of convenient time for follow-up cause unsatisfactory perceptions of exposure management among HCWs. This increases the likelihood of underreporting and decreases the likelihood of completing post-exposure health surveillance schemes (Ko et al., 2011). To enhance the efficiency of workplace risk management, addressing underreporting is essential. Hills and Wilkes (2003) suggested that a more accessible and rapid reporting procedure needs to be developed to ensure each incident can be accurately reported to the department of OHS. Such a report system would not only provide crucial information to predict occupational health among health care participants, but also help managers evaluate the outcome of current interventions.

Due to the nature of their work, HCWs may be unable to avoid exposure to biological hazards; however, the probability of risk can be minimised by effective workplace interventions. According to the recommendation from the Centers for Disease Control and Prevention (CDC), occupationally acquired blood-borne pathogen infections, including HIV/AIDS, Hepatitis B and other blood-borne pathogens, can be prevented through compliance with universal precautions (CDC–MMWR, 1998). Unfortunately, poor practice of universal precautions among HCWs is common in health care settings. A study of physicians in the United Kingdom (UK) measuring knowledge of, attitudes

towards, and compliance with universal precautions found that, although the majority of physicians knew that using protective equipment was important to protect themselves from blood-borne pathogens exposure, around three fourths (71%) did not wear gloves when taking blood samples (Stein et al., 2003). This study clearly presents a gap between what these HCWs knew and what they actually did. Kermode et al. (2005) explained that levels of compliance are associated with risk perception, workplace safety climate and perceived barriers to safe practice. In another words, HCWs may perceive the universal precautions as an optional practice, rather than a compulsory procedure.

In addition to universal precautions, many interventions to reduce the risks of occupational exposure to biological hazards have been adopted in hospitals. For example, if equipment such as sharps containers, gloves and needle devices are available and conveniently placed, this can help meet the needs of HCWs in their work process (Lau et al., 2004; Stein et al., 2003). In addition, researchers have acknowledged the preventive effects of education programs on occupationally acquired viral infections (Wicker et al., 2008; Yang et al., 2007). A convincing statistic in Yang et al.'s (2007) study showed that, after educational interventions, the incidence of sharps injuries declined 25% among nursing students. Indeed, education plays an irreplaceable role in enhancing individuals' behaviour and knowledge. Efforts to minimise the effects of organisational determinants are also being increasingly recognised as important. Both Gershon et al. (2000) and Clarke, Sloane et al. (2002) suggested that improving the organisational climate of safety by remedying problems of inadequate staffing and administrative support makes workers more likely to comply with safety practices and correctly use barrier protective devices (eye shields, disposable face masks and gloves), thereby reducing exposure incidence.

Providing direct care for patients with communicable diseases is common for HCWs. In this regard, vaccination is an important measure to improve individual workers' immunity against such infectious diseases. In clinical practice, the Hepatitis B vaccination is strongly recommended for those non-immune workers who are at risk of contact with blood or other body fluids (Hasselhorn et al., 1999, pp. 59–61). Moreover, the influenza vaccination is essential to protect HCWs during the seasons of influenza pandemic.

Influenza vaccinations protect workers from significant morbidity, prevent healthcare system disruption and protect vulnerable patients from transmission (Poland et al., 2005); however, concerns of possible side effects, doubts about efficacy and perceived risk of contracting the infection contribute to a low acceptance rate of this vaccination among HCWs (Chor et al., 2009). In terms of the vaccination against TB, the Bacille Calmette-Guerin (BCG) vaccine for HCWs may be controversial because its protective effects among adults is very low, and it causes a positive Purified Protein Derivative (PPD) skin test reaction for years, which may increase the difficulty of diagnosing infection with TB (Hasselhorn et al., 1999, pp. 94–98).

### **2.2.2 Ionising radiation hazards**

Ionising radiation hazards—including both photonic radiation (x and r rays) and charged particle radiation ( $\alpha$  and  $\beta$  rays) (Gestal, 1987)—are identified as another type of occupational hazard exposure among HCWs. In addition to unsealed radio elements, such as iodine, nitrogen, carbon and fluorine, which are the primary causes of high incidence of radiation exposure in HCWs (Lin & Mao, 2004), the growing medical use of radiological technologies—including nuclear medicine, computed tomography (CT) and gamma rays—for advanced diagnosis, screening or therapy has also raised concerns about occupational exposure to ionising radiation (Hasselhorn et al., 1999, p. 143). More attention has been given to the HCWs who are directly involved with radiological tasks. Evidence shows that nursing personnel and physicians are also subject to an increased risk of radiation exposure (Ciraulo et al., 1994; Hui et al., 2009). Moreover, many authors have speculated that HCWs working in EDs and trauma centres have a high risk of exposure because they are usually closer to the field of irradiation when performing care and administering medications for patients, or stabilising unstable fractures during radiological procedures (Dorevitch & Forst, 2000; Tan & Van Every, 2005).

There is agreement that the amount of radiation received by HCWs does not exceed the recommendations for occupational radiation exposures (Ciraulo et al., 1994; Hui et al., 2009; Tan & Van Every, 2005). Evidence from a recent Australian study examining the

staff risk from ionising radiation in a major trauma centre estimated that during a 30-year working life, radiation exposure for doctors working in trauma resuscitation is equivalent to two cervical spine x-rays (Tan & Van Every, 2005). Similarly, a study in an American teaching hospital found that, although residents had longer working hours and may receive more radiation than ED physicians and nurses, the levels of exposure among residents was consistently lower than the maximum dose set by the National Council of Radiation Protection and Measurement (Ciraulo et al., 1994). These conclusions seem to indicate that a potential risk of radiation exposure does indeed exist in hospital settings, but that the total of doses received is too low to induce a health concern in HCWs. However, these studies would have been more convincing if they had included consideration of the effect of the protective equipment used and work environment control on the levels of radiation exposure.

The adverse health consequences of ionising exposure cannot be overlooked. HCWs may suffer from somatic and genetic stochastic effects, including haematopoietic system, hypoplasia, dermatological and eye problems (cataracts), resulting from massive exposure to radiation (Gestal, 1987; Lin & Mao, 2004). A study conducted in Taiwan found that radio-diagnosis operators and radioisotope operators have abnormal leukocyte counts and elevated levels of thyroid-stimulating hormone compared with cancer therapy department personnel who experience ionising radiation exposure (Lin & Mao, 2004). This information indicates the importance of reducing the risk of ionising radiation exposure for HCWs.

In clinical practice, certain measures for protecting HCWs and mitigating exposure to ionising radiation have been considered. For example, the intensity of x-rays and radioisotope materials decreases by the square of the distance from the sources (Hasselhorn et al., 1999, p. 148). Thus, at 160 centimetres from the radiographic beam, the intensity of exposure is negligible (Grazer et al., 1987). The National Occupational Health and Safety Commission (NOHSC) (2002) in Australia also suggests that workplaces can be designed as 'controlled areas' and 'supervised areas' to avoid unreasonable exposure. In controlled areas, workers are required to comply with special

procedures for controlling radiation exposures. Supervised areas are those in which the working condition may have moderate risk of exposure, but do not require special procedures, and these areas may be used to limit the access of workers whose work does not involve exposure to radiation. In addition, the recommended dose limits for occupational exposure to ionising radiation are less than 50mSv in any single year for most body tissues and organs (NOHSC, 2002). However, Gestal (1987) argued that HCWs may underestimate their risk of somatic and genetic stochastic consequences from chronic low intensity radiation.

For effective risk management, a hierarchy of control measures for radiological protection and mitigation has been recommended by NOHSC (2002):

- avoid exposure
- apply shielding, containment and remote handling techniques to isolate the sources of radiation
- employ engineering control, such as exhaust ventilation to remove contaminants from the workplace
- adopt safe work practice, such as appropriate distance and shielding, to minimise exposure
- when the above control measures are not possible, it is essential to use approved personal protective equipment (PPE), such as special clothing or respiratory equipment.

In hospital settings, the intervention levels are likely to vary from case to case. Researchers have stated that using a personal dosimeter to monitor a worker's external exposure can provide more accurate and continuous data of personal radiation exposure (Lin & Mao, 2004). Additionally, using lead gloves while stabilising unstable fracture patients can prevent unnecessary exposure (Smith et al., 1992). Such studies provide evidence of the contribution of individual skills and knowledge to mitigate the possibility of exposure to ionising radiation. However, no single study exists that adequately examines the influence of supportive environment, workplace policy and health service for early prevention and protection.

### **2.2.3 Musculoskeletal hazards**

Musculoskeletal disorders (MSDs) are the most common work-related injuries among health care professionals in hospitals. Studies indicate that more than 80% of all work-related injuries in health care settings are MSDs, which cause significant time and financial loss to individuals and organisations (Jensen et al., 2010; Lipscomb et al., 2012; Ngan et al., 2010). Among the body regions, the lower back, neck–shoulders and knees are frequently complained of by HCWs (Andersen et al., 2012; Bos et al., 2007).

The prevalence of exposure to musculoskeletal hazards among HCWs is determined by a number of risk factors in their daily work. Recent evidence indicates that the characteristics of the work environment—such as excessive workloads, low job control and frequently accepting emergency patients—increase the risk of exposure to musculoskeletal injuries (Campo et al., 2009; June & Cho, 2011; Yeung et al., 2005). Moreover, nurse personnel have the highest prevalence of musculoskeletal symptoms among health care professionals (Boyer et al., 2009; Ngan et al., 2010). This can be interpreted as resulting from the fact that nurses are more engaged in direct patient care activities, such as manual handling of patients, applying strong force during transferring or positioning patients, and using awkward or asymmetric postures during the care process (Trinkoff et al., 2003; Yip, 2001). It is worth recognising that manual handling of aggressive patients or dealing with violent incidents contributes to work-related MSDs among HCWs (Miranda et al., 2011; Stubbs, 2009). For instance, Miranda et al. (2011) investigated the relationship between WPV and musculoskeletal symptoms among HCWs and concluded that the prevalence of low back pain increased from 40% among non-assaulted staff to 70% among those had been assaulted. If this conclusion is valid, HCWs working in unsafe work environments, such as EDs, are at a high risk of MSDs.

Several significant personal factors can predict the probability of MSDs. Evidence suggests that obesity can increase the burden on muscles and joints and impair physical fitness, which all increase the risk of low back pain (Shiri et al., 2010). In addition, some MSDs develop as a consequence of the aging process; however, Karahan et al. (2009) found that younger hospital staff had a higher prevalence of low back pain. They



speculated that younger individuals were less experienced in undertaking heavy, physically demanding work. Hence, these data must be interpreted with caution because other confounding factors—such as training status and job content—must be considered. In addition to the physical risk factors, many studies have confirmed the correlation between psychosocial factors and musculoskeletal complaints. For example, Smith, Choe et al., (2005) found that Korean nurses who were experiencing depression reported three times more musculoskeletal problems than those who were not depressed. Similarly, Reme et al. (2012) evaluated associations between MSDs and HCWs' physical and psychological health, and found that the respondents with MSDs had high levels of distress (such as nervousness, feeling hopeless and fatigue). However, these studies have failed to explain clearly why psychological factors increase the risk of musculoskeletal injuries. Thus, further investigations of this topic may be worthwhile.

The effects of work-related MSDs on HCWs and hospitals are obvious. Pain is the common complaint among HCWs suffering from musculoskeletal disorders; however, in some cases, neurologic symptoms—including numbness and tingling—are also reported (Pompeii et al., 2010). These uncomfortable symptoms can force HCWs to take sick leave for recovery, and may cause disability in their personal life. In addition, the adverse effects of this occupational injury on organisations are being recognised. According to Australian compensation statistics between 2008 and 2009, sprains and strains of joints and adjacent muscles resulted in 54% of serious claims in the health and community service industries (Safe Work Australia, 2011). However, many researchers consider that musculoskeletal problems among health care practitioners have been underestimated. In Yip's (2001) study, one third of the 377 nurses tended to self-prescribe treatment, such as taking analgesia, to alleviate pain because they accepted low back pain as part of the job, or because they did not recognise the symptoms as serious enough to be an occupational injury. If HCWs who experience MSDs do not take sick leave or report the problems, possible consequences may include underestimation of the real prevalence of MSDs, and restricted working capability of individuals. Thus, heavier workloads may fall on other colleagues and compromise the outcomes of team work (Pompeii et al., 2010).

A variety of workplace interventions to reduce the occurrence of work-related musculoskeletal injuries among HCWs have been implemented in hospitals. For example, health care sectors have adopted a ‘no lifting policy’ that emphasises safe lifting approaches by properly using manual lifting and transferring devices (such as hoists) to reduce physical workloads and strains among health workers (Collins et al., 2004; Martin et al., 2009). Martin et al. (2009) evaluated the effect of introducing this ‘no lifting policy’ in health care settings, and found that this ergonomic principle successfully reduced back injury claims by 24% among fulltime nursing staff in Victoria, Australia. This finding indicates that safety devices can facilitate the implementation of a safety policy.

Education is another crucial measure for behaviour and perception changes that can also facilitate implementation of ergonomic interventions in hospitals (Kindblom-Rising et al., 2011; Smedley et al., 2003). For instance, some equipment designed to reduce the risk of low back pain, such as slide sheets to reposition a patient in bed, may increase the risk of neck and shoulder injuries because of the inappropriate application of muscle strength and posture. Such problems can be addressed by improving staff’s knowledge of the standard for manipulation, or by providing training in manual handling techniques to operate equipment (Smedley et al., 2003). This example indicates that appropriate education interventions enhance the outcomes of using safe devices, as well as improving staff’s awareness of exposure to musculoskeletal injury in clinical practice.

For successful MSD prevention, risk management should adopt a more comprehensive approach. As the evidence presented above shows, policymaking, equipment and knowledge improvement can address the determinants of the individual and work environment for MSDs. However, the organisational and cultural aspects of work—such as staffing levels and a workplace culture that emphasises ‘patient first’—can significantly compromise HCWs’ adoption of safety instructions (Myers et al., 2012; Schoenfisch et al., 2011). In addition, overemphasising the importance of education and safety devices may detract from the focus on addressing organisational determinants. Therefore, an integrative approach that considers multiple factors is essential for the development of effective workplace interventions.

#### **2.2.4 Chemical hazards**

There are concerns regarding the health of HCWs who work with hazardous substances such as sterilants, anaesthetic gases and antineoplastic drugs; however, identifying such pharmaceuticals as chemical hazards is inconsistent and depends on personal perceptions (McDiarmid, 2006). With regard to OHS among HCWs, exposure to chemical hazards remains a serious occupational concern in health care facilities.

There may be more than one route of exposure in hospital settings; however, skin contact and inhalation have been recognised as the primary routes (Connor, 2006). The contamination level of hazardous drugs has also been associated with the amount of drug preparation, use of protective equipment, and frequency and duration of drug exposure (National Institute for Occupational Safety and Health [NIOSH], 2004; Yoshida et al., 2011). Generally, pharmacy and nursing personnel are likely to be at a greater risk of occupational exposure than other health professionals because they are frequently engaged in care activities, such as preparing hazardous drugs, disposing waste and cleaning up spills. These activities may result in exposure through directly touching contaminated surfaces and inhaling vapours (Connor & McDiarmid, 2006). These findings may have implications for the intervention development of chemical exposure among HCWs.

The adverse health effects resulting from exposure to hazardous drugs—including skin irritations, reproductive problems and possibly cancers—have been previously described (NIOSH, 2004; Skov et al., 1992). Evidence from previous studies shows an increased risk of spontaneous abortion, premature birth and congenital malformation among individuals who work with or near antineoplastic drugs (Stucker et al., 1990; Valanis et al., 1999). In contrast, Skov et al. (1992) did not find a statistically significant risk of reproductive outcomes among nurses handling antineoplastic drugs during pregnancy. However, the results did demonstrate an increased risk of leukaemia. Regarding these inconsistent conclusions, more current research investigating the negative health effects of exposure to hazard drugs for HCWs is required.

To minimise these potentially acute (short-term) and chronic (long-term) effects of exposure to hazardous drugs at work, NIOSH (2004) made recommendations for employers and HCWs as follows:

1. Assess the hazards in the workplace:
  - Evaluate the workplace to identify and assess hazards before anyone begins working with hazardous drugs.
  - Regularly review the current inventory of hazardous drugs, equipment and practices, seeking input from affected workers.
  - Conduct regular training reviews with all potentially exposed workers in workplaces where hazardous drugs are used.
2. Handle drugs safely:
  - Implement a program for safely handling hazardous drugs at work, and review this program annually on the basis of the workplace evaluation.
  - Establish procedures and provide training for handling hazardous drugs safely, cleaning up spills, and using all equipment and PPE properly.
  - Establish work practices related to both drug manipulation techniques and general hygiene practices, such as not permitting eating or drinking in areas where drugs are handled (the pharmacy or clinic).
3. Use and maintain equipment properly:
  - Develop workplace procedures for using and maintaining all equipment that functions to reduce exposure, such as ventilated cabinets, closed-system drug-transfer devices, needle-less systems and PPE.

PPE and health surveillance are essential in risk management. PPE (including gloves; gowns; respiratory protection; eye and face protection; and sleeve, hair and shoe covers) is a crucial protective measure that should be adopted in the context of overall health care activities and adherence to practical standards in order to protect HCWs from occupational exposures (NIOSH, 2008a). Further, medical surveillance should be routinely monitored and included in occupational safety and health programs. This is because medical surveillance provides the data for early detection of changes in the

health status of workers who are potentially exposed to hazardous drugs (Connor & McDiarmid, 2006).

There are other factors that may compromise the optimal outcomes of workplace interventions with respect to chemical hazards in hospitals. Burm (2003) stated that, despite using an evacuation system, anaesthetic gas in the operating and recovery rooms cannot be completely eliminated from the air because of leaks from the patient's face mask or ventilator, as well as exhalation after termination of anaesthesia. Although this statement lacks supporting data, it may raise concerns that chemical exposures are ubiquitous and unavoidable in hospital work environments, despite safety precautions. Additionally, current health care institutions are facing complex and rapid changes inducing excessive workloads for health care practitioners, as well as high staff turnover and insufficient staffing levels, which also affect the outcomes of administrative controls (Connor & McDiarmid, 2006; Ramsay et al., 2006). Undeniably, there are some limitations on the environmental prevention measures, and these will affect the efficiency of chemical hazard prevention for HCWs. Therefore, it is essential to implement workplace interventions that consider a comprehensive approach.

### **2.2.5 Psychosocial hazards**

According to the category of occupational hazards among HCWs by WHO (n.d.b), psychosocial hazards include violence, shift work and stress. There is increasing concern about the risk of exposure to these psychosocial hazards because their influence on the OHS of HCWs is hard to ignore.

#### *2.2.5.1 Violence*

**{Following section includes the published paper, “The needs and potential solutions for improvement of workplace violence management in emergency departments in Taiwanese hospitals” have been removed from this copy for copyright reasons.}**

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#### 2.2.5.2 *Shift work*

Shift work is a major feature of work in hospitals that provide a 24-hour continual health service for patients. However, shift work can lead to negative consequences for work safety and performance, and affect the personal health and life of HCWs.

Shift work affects work safety and job performance. Findings from previous studies have demonstrated that there is a consistent tendency of higher incidence of occupational injuries or clinical errors during the night shift than during the day shift (Folkard & Tucker, 2003; Horwitz & McCall, 2004; Shao et al., 2010). A possible explanation for this might be that shift work can impair levels of alertness, which decreases cognitive skills, prolongs reaction time and decreases the coordination of workers (Berger & Hobbs, 2006). Several studies have also argued that the interference of certain underlying factors—including staffing levels, task differences and number of successive night shifts—may affect job performance and injury risk among night shift HCWs (Folkard & Tucker, 2003; Horwitz & McCall, 2004).

Rotating shifts, particularly during the night, have significant effects on the personal health of HCWs. Elevated triglyceride levels have been detected among workers performing shift work, and this may increase the risk of cardiovascular disorders (Karlsson et al., 2003). Moreover, hormone adjustment during the night, including cortisol and melatonin, can be interrupted by exposure to frequent shift changes (Berger & Hobbs, 2006). A correlation between the morbidity of certain cancers, such as breast

and skin cancer, with shift work has been recognised in a number of studies (Schernhammer et al., 2001; Schernhammer et al., 2011).

Of the many health-related effects of shift work, gastrointestinal malfunction and sleep disruption are the most common among hospital workers. Hasselhorn et al. (1999, p. 188) found that shift workers have a higher prevalence of constipation and diarrhoea as a result of alterations in eating habits. This is because altered eating habits can cause the appetite and gastrointestinal functions to have difficulty following the normal biological system. Sleeping problems have also been identified as a more immediate disturbance and common complaint related to shift work (Lin et al., 2012). According to a recent study in Taiwan, approximately 60% of nurse participants experienced poor quality of sleep due to rotating shift work (Shao et al., 2010). This may induce nurses to increase their consumption of caffeine, alcohol or sleeping pills to adapt to shift work (Berger & Hobbs, 2006). Such unhealthy behaviours can induce more serious problems associated with health and work performance. Unfortunately, researchers have not addressed this topic in great detail thus far.

Alongside the disorders of circadian rhythm and metabolic systems, shift and night work may have more adverse effects for women in terms of their reproductive health and family role. Lawson et al. (2011) examined cross-sectional data collected in 1993 to investigate the rotating shift work and menstrual cycle patterns of 71,077 nurses aged 28 to 45 years, who were menstruating and not using oral contraceptives. Lawson et al. argued that shift work is associated with menstrual function and has possible implications for cycle-related aspects of women's health. In addition, Lawson et al. (2009) published a paper discussing occupational risk factors and preterm birth in female nurses, in which they reported that working the night shift is a more significant risk for early preterm birth than other occupational factors, including physical demands and exposure to chemicals or x-rays. Although current studies about the association between shift work and reproductive health are rare, it seems reasonable to advise managers to pay attention to these adverse effects on pregnant workers, and ensure their health and wellbeing are protected.

Data from several sources have indicated concerns about the difficulty of HCWs maintaining a work–life balance when undertaking varied shift work schedules (Drake et al., 2004; Portela et al., 2004). Portela et al. (2004) examined the influence of shift work and found that HCWs who work night shifts more than four times per fortnight are more likely than day workers to complain about having insufficient time for nonprofessional activities, including leisure, rest and being with family. Further, participating in social activities can be problematic for rotating shift workers due to fatigue, lack of sleep and irregular work times (Drake et al., 2004). In a study investigating the factors influencing nurses' intention to leave the profession, Flinkman et al. (2008) found that work–family conflicts and the inconvenience of shift work/work hours influenced nurses' intentions to leave. In addition to providing information about the influence of shift work on individual workers, these data also have important implications for hospital managers in retaining and recruiting HCWs.

Although the adverse effects associated with shift work are significant, the working style of rotating shifts is unavoidable in hospital facilities. In this regard, several attempts have been made to create a supportive environment and improve workers' adaptation to shift work (Folkard & Tucker, 2003; Shao et al., 2010). For example, a long night shift that includes frequent rest breaks is suggested to be safer than a shorter night shift with less frequent breaks (Folkard & Tucker, 2003). Considering the personal needs of shift workers, as well as improving their ability to adapt to rotating shifts and manage their own life, have also been identified as essential for developing organisational interventions (Shao et al., 2010). However, the literature review found that existing studies have tended to focus on the effects of shift work, rather than on developing effective interventions to address the problems. For the best outcomes of health promotion and risk reduction among HCWs in hospitals, issues related to shift work must be taken seriously.

#### 2.2.5.3 *Stress*

Occupational stress has been identified as ‘the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker’ (NIOSH, 2008b). Although health care personnel are educated in professional knowledge to address health, diverse stressors exist in current health care work environments that challenge workers’ physical and psychological tolerance daily. Such health outcomes of HCWs may also lead to adverse consequences for health care institutions. Occupational stress has become a significant issue related to the OHS of HCWs.

In recent years, there has been increasing literature investigating the determinants of occupational stress among HCWs. Studies show that HCWs with certain demographic characteristics, such as being younger, being single, having insufficient social support and having lower education achievement, tend to report high levels of work stress (Shen et al., 2005; Yang et al., 2004). However, interestingly, Adeb-Saeedi (2002) and Mojdeh et al. (2008) did not find significant correlations between these demographic variables and perceptions of work stress. This disagreement may be anticipated because stress perception is highly subjective. Regarding risk determinants, organisational factors may have strong influences on the job stress of HCWs. The common stressors perceived by HCWs are professional responsibility and role, job control, and access to support and resources (Dougherty et al., 2009; Li et al., 2008). In addition, job stress can be attributed to a wide range of environmental determinants, such as insufficient staffing levels to deal with heavy workloads, and dealing with end-of-life issues (Currid, 2009; Embriaco et al., 2007). Such daily work content means that job stress among HCWs may be difficult to remove.

A considerable amount of literature has identified EDs as stressful workplaces for HCWs in hospitals (Adeb-Saeedi, 2002; Adriaenssens et al., 2011; Gillespie & Melby, 2003; Laposa et al., 2003; Ross-Adjie et al., 2007). Although no large-scale studies have examined work stress levels among HCWs in different care units, a number of studies have suggested that the nature of the work and specific job demands in EDs—such as time restraints, dealing with multidisciplinary cases or seriously ill patients, and

unpredictable patient flow—distinguish their specific environmental stress factors from other care units (Adeb-Saeedi, 2002; Ross-Adjie et al., 2007). This may indicate that workplace interventions should address the different sources of stress according to the specific work characteristics of each care unit in hospitals.

Interpersonal conflicts and the risk of hazard exposure at workplaces have also been recognised as major sources of stress. Evidence indicates that problems of collaboration between health professions, poor communication with supervisors, and issues of public criticisms—such as lawsuits, patients’ inappropriate expectations and incorrectly informed patients—affect the levels of work stress perceived among HCWs (Golubic et al., 2009). It may be interpreted that, since hospitals operate on a teamwork model and emphasise satisfactory care service for the public, interpersonal conflicts at the workplace may pose additional stress for clinical staff. Further, the findings that bullying and sexual harassment are prevalent also support the suggestion that interpersonal conflicts between colleagues can cause stress (Longo & Smith, 2011; Pai & Lee, 2011).

The correlation between the risk of occupational exposure and work-related stress among HCWs has been widely investigated (Conway et al., 2008; Ross-Adjie et al., 2007; Wang et al., 2012). For example, a cross-sectional descriptive study by Ross-Adjie et al. (2007) concluded that WPV was the top ranked stressor among ED nurses in Western Australian. In addition, Wang et al. (2012) investigated the relationship between sharps injuries and job burnout in China nurses. They found a significant difference in emotional exhaustion and depersonalisation between nurses who had experienced sharps injuries and those who had not. It can be concluded that the determinants of occupational stress among HCWs are complex and interrelated. Workplace interventions should aim for a comprehensive approach to ensure the best outcomes of stress reduction for HCWs.

Prolonged exposure to workplace stress has profound effects on staff’s health. Many studies have pointed out that high levels of work stress affect more than half of clinical staff who suffer from burnout (Embriaco et al., 2007; Lasalvia et al., 2009). Further, Gillespie and Melby (2003) examined three dimensions of burnout syndrome among

nursing staff: emotional exhaustion, depersonalisation and a sense of low personal accomplishment. They found that there was a high prevalence of emotional exhaustion among nurses working in acute medicine units. However, the overall levels of depersonalisation and personal accomplishment did not affect the clinical practice or personal lives of the participants. These data must be interpreted with caution as they were derived from a small number of samples and cannot be extrapolated to all HCWs. To alleviate the common symptoms of headaches resulting from work stress, resting or self-prescription are often applied by HCWs (Lin et al., 2007). However, a striking finding from a previous study (Callaghan et al., 2000) indicated a prevalence of using alcohol and smoking among clinical staff to cope with pressure at work. The reasons for these unhealthy individual behaviours are unclear; however, such passive coping measures (avoiding problems or waiting to see what happens) are more related to self-perceptions of poor health among HCWs (Schreuder et al., 2012).

Apart from the health effects, higher levels of perceived stress could be negatively correlated with job satisfaction, work performance, absence from work and staff turnover. For example, an empirical study investigating turnover propensity and its causes among Singapore nurses found that stress is a significant predictor of intention to leave the job (Fang, 2001). Similarly, a Canadian study concluded that seeking support and considering job change were the most frequent reactions to stress in emergency department personnel (Laposa et al., 2003). Issues about occupational stress among clinical staff have appeared to be difficult to handle and may be a response to severe staff shortage in health care institutions. Hence, developing feasible stress interventions can be the first step to enhancing occupational health among health care practitioners.

Personal coping strategies dominate stress management among HCWs. Previous studies have found that HCWs tend to manage stress in individual ways (such as sleeping and undertaking leisure activities) or via social support (such as talking to family, friends or colleagues), but rarely seek professional help (Callaghan et al., 2000; Lin et al., 2007). Although personal coping behaviours and social supports have been proved to moderate the effects of job stress on HCWs (AbuAlRub, 2004; Lin et al., 2010), there may be a

question about organisational interventions to minimise the sources of stress and assist HCWs to adapt to job stress. As respondents from a Western Australian study by Ross-Adjie et al. (2007) suggested, debrief programs for stress management should be conducted by well-trained professionals, and should consider staff's privacy and available time. This suggestion highlights the importance of developing concrete and feasible workplace interventions with respect to stress management.

The features of the work environment in hospitals produce a variety of stressors for HCWs. In this regard, the NIOSH (2008b) made some suggestions regarding organisational change interventions for job stress in hospitals:

- ensure that the workload aligns with workers' capabilities and resources
- clearly define workers' roles and responsibilities
- give workers opportunities to participate in the decisions and actions affecting their jobs
- improve communication
- reduce uncertainty about career development and future employment prospects
- provide opportunities for social interaction among workers.

Further, to ensure these organisational interventions will succeed, empowerment of employees, development of supportive culture and periodic evaluation of the stress intervention are required (NIOSH, 2008b).

### ***2.3 Current approaches in workplace hazard management: needlestick and sharps injury as an example***

Current approaches to occupational exposures seem to be inadequate. Many researchers have acknowledged that workplace hazard exposures in health care settings are attributed to various interacting determinants (Adriaenssens et al., 2011; Chen et al., 2009; Courvoisier et al., 2011). Nevertheless, current models of intervention have tended to deal with the problems by addressing one or two determinants, and only a few have considered that workplace incidents result from multiple interacting determinants. An approach that has often been applied in other industries for preventive and protective



measures against occupational accidents and diseases in workplaces is the OHS ‘hierarchy of control’ (see Figure 2.1). The order of priority of controls includes the following:

1. Eliminating the risk:

Eliminating risk can be achieved by engineering controls. In addition to building protection into the design of the workplace, the use of a machine to undertake dangerous work, rather than exposing a worker to the hazard, is also suggested for risk elimination in workplaces.

2. Substituting a less hazardous substance:

In some cases, a hazardous substance may need to be replaced by other materials and products that are less harmful in order to reduce exposure to hazardous substances as much as possible.

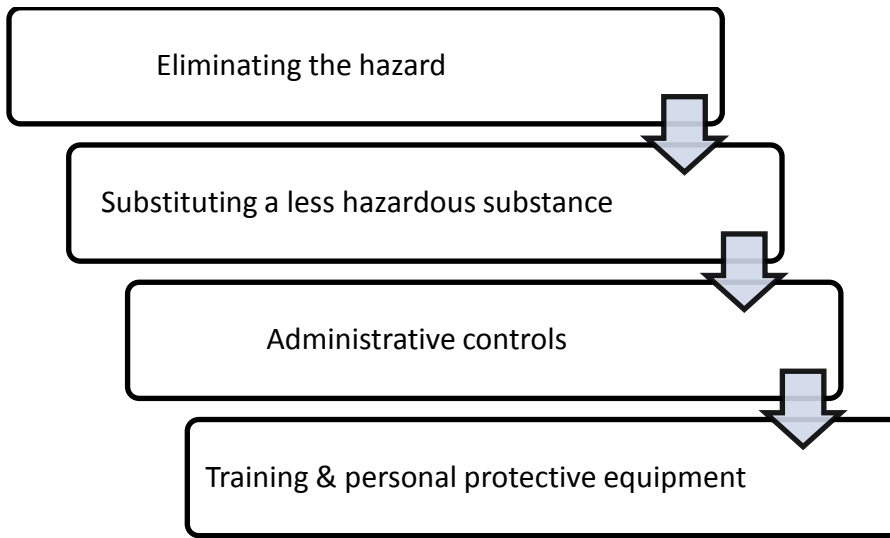
3. Administrative controls:

When the elimination of risk and substitution of materials are both impracticable, administrative controls—including appropriate work practices and arranging work time to minimise exposure—should be implemented.

4. Training and PPE:

When the above approaches are unfeasible or inadequate, providing exposed workers with appropriate training and PPE is required. However, this is the least preferred measure of risk management because it relies on the active cooperation and compliance of individual workers (Benjamin, 2008, p. 106–108; Mayhew & Peterson, 2005, p. 137).

**Figure 2. 1 The OHS hierarchy of control**

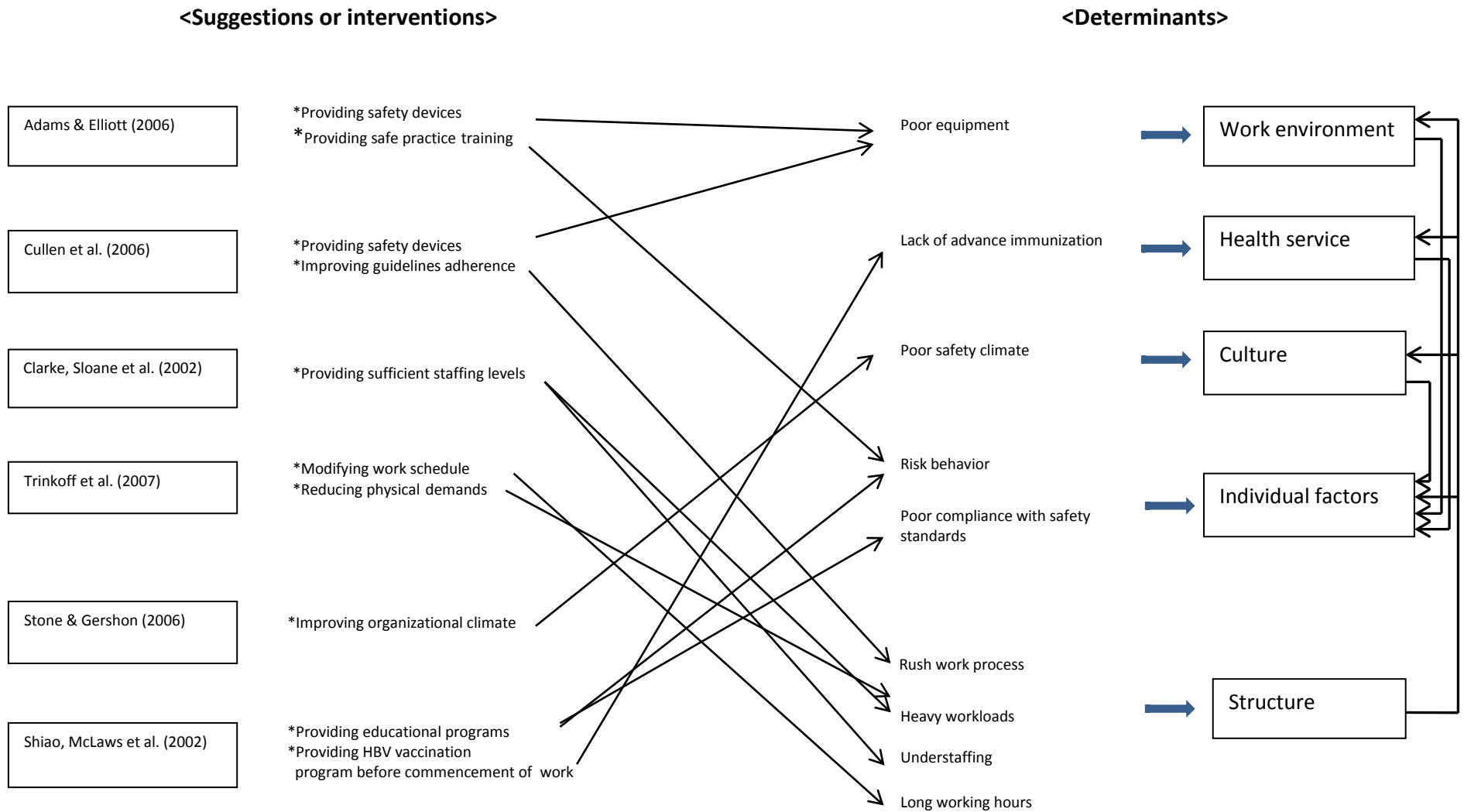


Modified from Benjamin (2008, p. 106-108) and Mayhew & Peterson (2005, p. 137)

The available evidence suggests that this hierarchy of control has not been widely and properly adopted in hospitals, since the majority of risk prevention and management strategies have concentrated on lower-order strategies, rather than the top of the hierarchy of control options (Mayhew & Peterson, 2005, p. 8). This may raise a question about the effectiveness of workplace hazard management in hospitals. The following section uses needlestick and sharps injury as an example to explain the limitation of current approaches to address risk.

The determinants of exposure to needlestick and sharps injuries are complex. As the literature has shown, the levels of safe practice are more associated with the effects of wider organisational determinants, such as safety climate (culture), workloads (organisational structure) and equipment provision (work environment) at the workplace (Clarke, Rockett et al., 2002; Kermode et al., 2005). If individual behaviour directly causes a needlestick or sharp injury, then organisational and environmental factors can be identified as contributors to forming the behaviour and enhancing the exposure of risk (see Figure 2.2). Hence, without an integrative approach to address multiple interrelated determinants, the outcome of hazard prevention may be limited.

**Figure 2. 2 Multiple interacting determinants and current measures to prevent exposure to blood-borne pathogens through needlestick or sharps injuries in hospitals**



As illustrated in Figure 2.2, the existing preventive measures to reduce needlestick or sharps injuries for HCWs are inadequate to address multiple interrelated determinants. For example, Adams and Elliott (2006) suggested providing safety devices and safety practice training to deal with poor equipment provision at the workplace and individual risk behaviours. This appears to be a reasonable suggestion and may be feasible in hospitals; however, such approaches only deal with one or two determinants in isolation. These suggestions would be more valuable if they involved organisational support, such as workload reduction. With respect to current workplace interventions to minimise the risk of needlestick or sharps injuries in hospitals, although some measures have had significant outcomes, the results have not been consistently supported by other studies. It is important to recognise that each determinant has only a partial effect on the risk of hazardous exposure—a single approach is unlikely to minimise risk successfully. In fact, an integrative approach to deal with multiple interrelated factors has been strongly recommended for workplace interventions to reduce the risk of hazard exposure among HCWs (Koppelaar et al., 2013; Papadopoulos et al., 2010). Unfortunately, this suggestion does not seem to be implemented in hospitals. For effective workplace hazard management, future intervention development will need to move in this direction.

## ***2.4 Conclusion***

To summarise, HCWs are exposed to a wide range of biological, chemical, radiation, ergonomic and psychosocial hazards in their daily work. Studies in the field of OHS among HCWs have been dominated by investigations of multiple interacting determinants of hazards exposure, as well as of the adverse effects on individual workers and organisations. Although a few studies have investigated possible sustainable interventions to minimise the risks of hazardous exposure in hospitals, there has been little consideration that exposure to workplace hazards can be attributed to multiple and interrelated determinants. Thus, these attempts to reduce risk exposure rarely have satisfactory outcomes, and exposure to workplace hazards has remained a significant concern among HCWs. In this regard, an integrative approach for workplace hazard management is required.

Exposure to occupational hazards is common among HCWs in hospitals; however, the ED has been suggested as a particularly risky workplace for HCWs. Studies have not described in much detail the causations between the workplace conditions in EDs and the risks of occupational exposure among HCWs. This may indicate that broadly exploring the working environment and job demands of EDs is necessary. In response to global concerns about OHS among HCWs in hospitals, there will be considerable benefit in comprehensive reviews of the workplace problems in Taiwanese hospitals, particularly in EDs, for further development of effective and feasible interventions to improve occupational health and reduce hazard exposure for HCWs.

## **Chapter 3 Issues of Workplace Health and Safety in EDs in Taiwanese Hospitals**

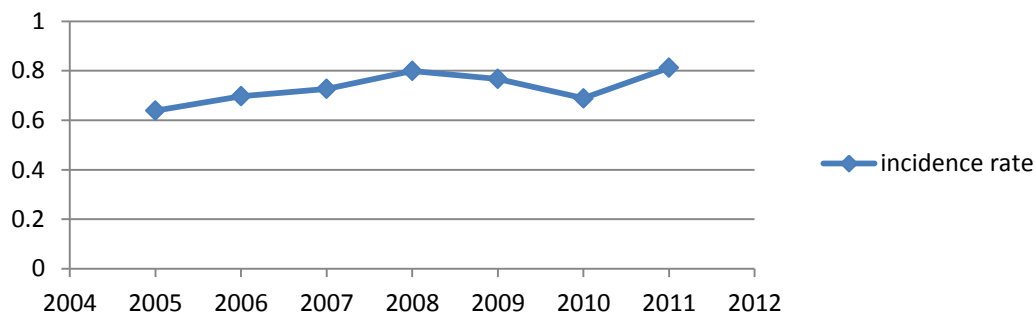
### ***3.1 Introduction***

EDs are recognised as risky workplaces for HCWs in hospitals (Kansagra et al., 2008; Ross-Adjie et al., 2007). Although published studies have described the problems of occupational exposure among HCWs in Taiwan (Chen, Wu et al., 2005; Lin et al., 2012; Shiao et al., 2009; Wang et al., 2011), there is a scarcity of studies investigating workplace problems and risks, particularly in EDs. This chapter reviews the existing literature to gain a better understanding of workplace health and safety in the context of Taiwanese hospitals. More importantly, it reviews in detail the special work environment and job demands in EDs in common situations around the world, as well as the potential challenges and difficulties in addressing OHS among HCWs in Taiwanese EDs.

### ***3.2 Occupational injuries and diseases among HCWs and current interventions in Taiwanese hospitals***

In Taiwan, data about work-related injuries and illness among HCWs are classified under the group of ‘human health and social work services’ (Council of Labor Affairs, Taiwan, 2012). Although the incidence of occupational injury and disease among this combined group is lower than for other occupations—such as manufacturing or professional, scientific and technical services—the incident ratio in the group of human health and social work services climbed from 0.639 in 2005 to 0.812 in 2011 (Council of Labor Affairs, Taiwan, 2012) (see Figure 3.1). This raises a concern about the prevalence of work-related injuries and diseases among HCWs in Taiwan.

**Figure 3. 1 Incident ratio<sup>1</sup> of nonfatal occupational injuries and illnesses among workers in human health and social work services in Taiwan (2005-2011)**



1: Per 1000 employees

Note: Based on Standard Industrial Classification System of R.O.C. from January 2010, the group of “Health care & Social welfare services” was reclassified as “Human health & social work services”.

Source: Council of Labor Affairs, Taiwan (2012)

As in other countries, HCWs in Taiwan experience threats to their health from exposure to various hazards in their daily work. A national investigation revealed that the top three potential hazardous exposures in Taiwanese hospitals are needlestick, musculoskeletal injury and biological infections (IOSH Taiwan, 2010, p. 42). In addition, certain severe occupational incidents involving Taiwanese HCWs have been reported in the media. Examples include an emergency department physician suffering serious head injury from a patient’s violent assault; young physicians suspected to have died suddenly from high levels of stress and excessive workloads in the office or home; and an entire organ transplant team being exposed to blood contamination with HIV pathogen during an operation, without any advance warning. These situations cannot be treated simply as stories. They imply a need for a comprehensive understanding of work-related injuries and diseases among HCWs, and current interventions of exposure to workplace hazards in Taiwanese hospitals. Most Taiwanese studies in the field of OHS among HCWs have focused on issues related to biological hazards, WPV and stress. The following section will analyse these hazard exposures separately.

### **3.2.1 Biological hazards**

Health care is a special profession that requires frequent exposure to biological hazards at work. Exposure to blood-borne pathogens has become a significant concern for the occupational health of HCWs in Taiwan. A recent national study about the incidence of percutaneous injuries (PCIs) in Taiwan showed that approximately 8,200 PCIs were reported annually in hospitals. These included 1,168 cases who had been exposed to Hepatitis B, 1,263 cases of exposure to Hepatitis C and 59 cases of exposure to HIV (Shiao et al., 2008). To estimate the frequency of PCIs among HCWs and provide valuable information for developing effective interventions, the Chinese Exposure Prevention Information Network (EPINet) is applied as part of the OHS approach (Shiao et al., 2008).

Underreporting remains common in Taiwanese hospitals. A study that investigated the proportion and reasons for underreporting PCIs among HCWs in Taiwan found that nearly four in five PCIs were not officially documented due to the complexity of the reporting procedure, incorrect knowledge about transmission risks or time constraints (Shiao et al., 2009). The reasons cited by respondents were similar to those in other international studies (Burke & Madan, 1997; Kessler et al., 2011). With respect to the prevalence of blood-borne exposures and underreporting among HCWs, the benefits of educational approaches have been emphasised. Yang et al. (2007), who evaluated the effectiveness of a training program on reducing needlestick and sharps injuries among nursing students in southern Taiwan, found that, after knowledge improvement, there was a significant decline in needlestick/sharp injury rates, from 50.5 to 25.2%. Further, the incident report rate rose by about 20%.

Once injury has occurred, it is important to comply with post-exposure management that aims to monitor the health condition and provide prompt treatment for victim workers. However, numerous reasons affect Taiwanese HCWs' intentions to comply with post-exposure management. For example, Ko et al. (2011) found that personal attitudes and perceptions regarding the follow-up procedure, as well as social pressure, caused only 60% of exposed nurses to complete their serology monitoring after a contamination



incident. In addition, it is important to pay attention to the effects of safety climate on OHS management. Mearns and Flin (1999) described 'safety climate' as related to employees' perceptions, attitudes and beliefs about risk and safety in workplaces. Safety climate is an organisational element that enhances the traditional occupational risk management in safe work practice and hazard control in hospitals. In most instances, when employees perceive that the organisation supports and values safety rules and procedures for accident prevention and healthy workplace improvement, they are more willing to engage in safety-related activities (Clarke, 2006). Evidence in a previous study clearly showed that HCWs in hospitals that have strong safety climates have fewer exposure incidents (Gershon et al., 2000).

After the SARS outbreak in 2003, there has become concern about the effective management of risks of exposure of HCWs to airborne pathogens. Such unpredictable and fatal occupational hazard increases levels of stress and concerns of life threat among both emergency physicians and nurses in care provision, particularly during emergency resuscitation (Chen, Cheng et al., 2005). Before the SARS epidemic, the common concern regarding airborne transmission of disease among HCWs was TB. There were estimated to be 14,265 TB cases (62 cases/10,000 population) during 2008 and 13,336 cases (58 cases/10,000 population) during 2009 in Taiwan (CDC, Taiwan, 2010). Although the number of infectious people has declined, about 10% of open TB cases are not detected, which negates the efforts of medical and public health interventions (CDC, Taiwan, 2007), and threatens the occupational health of HCWs. A series of workplace interventions have been implemented in hospitals to protect HCWs from risk of exposure to airborne pathogens. Common interventions include adherence to barrier precautions in terms of gowns, gloves, goggles, N95 masks and hand washing, as well as health surveillance (Twu et al., 2003). Tzeng (2005) argued that HCWs may be vulnerable to TB exposure prior to the results of chest x-ray and sputum tests being released because, in clinical practice, HCWs are seldom informed and followed up if the patient for whom they have directly provided care is confirmed with TB infection. This may indicate inadequate occupational risk management in hospitals.

### **3.2.2 Violence**

**{Following section includes of the published paper, “The needs and potential solutions for improvement of workplace violence management in emergency departments in Taiwanese hospitals” have been removed from this copy for copyright reasons.}**

### **3.2.3 Stress**

Work stress is prevalent among HCWs. Yang et al. (2004) investigated the relationship between job strain and psychiatric disorders among nurses (n = 890) in Taiwanese hospitals. They found that one quarter of nurses perceived high levels of stress at work, and nearly half of those participants had suffered from some psychological disorders. In an investigation of occupational stress and depression among hospital physicians in Taiwan, Wang et al. (2011) reported that work demands and job control greatly affected levels of stress among physicians. In addition, a higher prevalence of depression rate was found in physicians (13.3%) than in other occupations (3.7%). HCWs perceived that high levels of work stress were more likely to increase intention to leave the job (Liu et al., 2010). The evidence clearly indicates that health care in Taiwan is a stressful occupation that can have adverse effects not only on workers' health, but also on staff retention in hospitals.

The work environment in health care is rife with various sources of job stress. Liu et al. (2010) investigated job stressors among ED nurses in Taiwan and found that a massive casualty event, delayed physician support, overloads of routine work or assignments, and

annoying paperwork are common stressors. Among these, excessive workload was identified as the primary source of stress. Workplace stressors also result from exposure to occupational hazards. Previous Taiwan studies show that the threat of assault at work was perceived as a stressor by nurses in psychiatric units (Shen et al., 2005), and acute stress disorders appeared among HCWs during the epidemic of SARS (Bai et al., 2004). Although stress is a personal experience that can be interpreted in different ways, primary job stressors have been identified consistently by HCWs in other countries (Currid, 2009; Dougherty et al., 2009). This is because their work in EDs has similar characteristics.

Personal measures have predominated in the coping strategies for work stress among Taiwanese HCWs. A cross-sectional study of job stress by Lin et al. (2007) reported that stress is associated with primary headaches among nursing staff. The methods used to deal with headaches include sleep, taking medicine and resting. However, nursing staff rarely seek professional help. Moreover, frequent alcohol consumption was found to be an indicator of job stress and depression among hospital physicians in Taiwan (Wang et al., 2011). Certain individual coping measures, such as substance abuse, are not very encouraging, and specifically indicate an inadequacy of professional support and stress reduction in hospital workplaces. It is important to recognise that the features of the work environment are major determinants of job stress. Although organisational interventions have been suggested as the best way not only to address occupational stress, but also to develop effective health promotion programs to assist HCWs (Yang et al., 2004), current efforts and outcomes of organisational interventions have not been documented in much detail. Taken together, the existing knowledge about workplace health and safety among HCWs in Taiwan is limited. This is because most Taiwanese research to date has tended to focus on defining the phenomenon and risk factors of occupational exposure, rather than developing integrative strategies to deal with problems.

Among the various factors of occupational exposure, the care unit is one important determinant. Chapter 2 discussed a number of international studies that have suggested that an ED is a risky workplace in hospitals (Adriaenssens et al., 2011; Gacki-Smith et al., 2009; Peek-Asa, Valiante et al., 2007; Perhats et al., 2012). Although it is impossible to

compare the prevalence of occupational injury and disease among different care units in Taiwanese hospitals, due to incomplete data and research, some studies have particularly focused on the problems of workplace hazard in EDs (Chen, Cheng et al., 2005; Liu et al., 2010). This implies that a comprehensive understanding of the challenges and difficulties in addressing OHS among HCWs in Taiwanese EDs is essential.

### ***3.3 Challenges and difficulties in addressing OHS among HCWs in Taiwanese EDs***

An ED is the frontline care unit in a hospital. It provides multidisciplinary and prompt medical service for the public 24 hours a day, 7 days a week. This significant function of care service distinguishes ED special working conditions from other care units, and means that emergency workers may be more vulnerable to hazard exposure during their daily work.

To provide prompt health assessment and timely delivery of appropriate treatment for the various patients with complex medical needs, the work environment in EDs is in turn complex. In recent decades, more attention has been paid to the phenomenon of ED overcrowding. Derlet and Richards (2000) argued that ED overcrowding results from multiple complex issues. For example, increased complexity and acuity of patients presenting to the ED, overall increase in patient volume, lack of beds for patients admitted to the hospital, and staff shortages can all contribute to overcrowding of the ED. Studies also found that the growing number of people with mental disorders and substance abuse problems presents a significant burden on emergency care services (Charalambous, 2002; Larkin et al., 2005). Overcrowded conditions in EDs have resulted in a number of adverse consequences. In addition to long waiting times and patient dissatisfaction with the care service, HCWs are negatively affected in a number of ways, including excessive workloads and stress, incidents of WPV, miscommunication, declining job productivity, and increasing mortality among ED patients (Bond et al., 2007; Derlet & Richards, 2000; Sprivulis et al., 2006).

Dealing with unpredictable patient flows and health conditions is a notable characteristic of jobs in EDs. As an ED is a multidisciplinary and prompt care unit, its working conditions have rapid pace and low predictability. Patients are moved on quickly—either discharged from the hospital or transferred to other care units. In addition, it is impossible to know what kind of patient will present at the ED at any time. Such working conditions distinguish the ED environment from intensive care units and general wards (Hoff, 2008). In clinical practice, the patient–staff ratio has frequently been considered an objective reference for workload among HCWs, and this ratio has significant correlation with job satisfaction, psychological health and perception of hospital management among HCWs (Burke, 2003). However, patient–staff ratios may be inappropriate for the ED situation because the unpredictable patient flows and variability of patient acuity may influence the effects of patient–staff ratio on staff’s health and work perception. This suggests that there are unreasonable workloads for HCWs in EDs.

To address inconsistent patient flow in EDs, HCWs may have to deal with numerous patients simultaneously. Interruptions are common in the daily work of ED HCWs. In an analysis of communication loads on clinical staff in EDs, Spencer et al. (2004) found that 90% of clinicians’ time was spent in communication, including face-to-face or telephone conversations. However, one third of communication events were classified as interruptions. Coiera et al. (2002) argued that the combination of interruptions and multiple concurrent tasks is likely to produce clinical errors by disrupting memory processes. While it has been found that interruptions may compromise workflow and job efficiency in EDs (Brixey et al., 2008), further research about the effects of interruptions on the risk of occupational exposure among ED HCWs is required.

The ED physical environment is often unpleasant and frightening to patients and their families. Gulrajani (1995) argued that a major aspect of the ED environment is that it addresses the convenience of care delivery for staff, but rarely considers the privacy protection and psychological needs of patients. One observable example is that curtains, instead of doors, are used to separate patients. Consequently, patients and families are more likely to be affected by end-of-life issues and loud or disturbing noise (such as

crying, shouting and groaning) in the surrounding environment. Such an uncomfortable environment probably creates a stressful experience and may give negative perceptions about EDs.

Due to their responsibility for frontline health care, the work demands of EDs may produce significant concerns about dealing with the victims of biological, chemical and radiological terrorism, as well as patients suffering from new communicable diseases, such as SARS, even though such incidents have rarely occurred to date. In 2005, Chen, Cheng et al. published a paper in which they described that ED physicians and nurses in Taiwan experienced high levels of job stress during the SARS outbreak. However, studies have consistently demonstrated deficiencies of preparedness in terms of personnel training, policymaking and resource availability in EDs to deal with such incidents (Greenberg et al., 2002; Hammad et al., 2011; Wetter et al., 2001). An Australian study about ED staff's knowledge and perceptions of their role in disaster response found three major themes (Hammad et al., 2011). First, the staff had minimal disaster experience. Second, the staff questioned the appropriateness of their disaster education and training. Third, the level of disaster knowledge among the emergency staff was very low. Thus, HCWs in EDs may have poor confidence in protecting themselves or providing care for victims while encountering these threats.

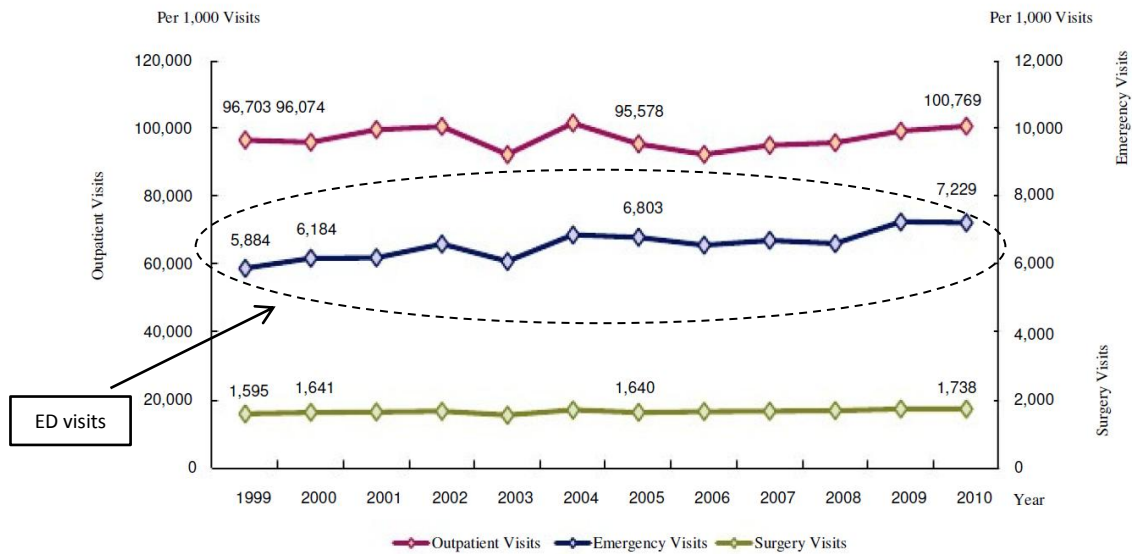
The characteristics of EDs increase concerns about OHS of HCWs. In an ED, the specific job demands and physical environment—such as rapid pace of work, threats of unpredictable communicable disease, overcrowding and an uncomfortable atmosphere—have resulted in this workplace becoming so complex that it is difficult to control the risk of occupational exposure for HCWs. Numerous studies have attempted to explain the causal relationships between ED working conditions and the risk of hazard exposure among HCWs (Adriaenssens et al., 2011; Chen, Cheng et al., 2005; Tang et al., 2007). This highlights the importance of improving OHS among HCWs in EDs by addressing these specific workplace characteristics.

To understand the factors influencing OHS among HCWs, the features of the health care system should be taken into account. These features represent a set of underlying determinants of the working conditions, working procedures and personal safety of HCWs. In Taiwan, the health care environment has undergone significant changes since the universal NHI program was introduced (Cheng, 2003; Hsu & Wu, 2009). This health insurance program ensures equality and freedom of access to the health care system, while also encompassing comprehensive health services for all citizens in Taiwan, such as inpatient care, laboratory tests, diagnostic imaging, traditional Chinese medicine, dental care and emergency care (Cheng, 2003). Undeniably, NHI has produced great benefits for citizens; however, the operation of NHI affects the allocation of medical resources and the functioning of hospitals.

Under the NHI program, people share in minimal medical expenditure. Recent data showed that the average cost of each ED visit was NT\$1,792 (US\$54.3) for insurers. Further, the average treatment- and drug-associated expenditures in EDs were NT\$1,155 (US\$35.0) and NT\$190 (US\$5.8), respectively (Yang et al., 2009). In comparison, the average cost per visit for trauma and non-trauma patients in America was US\$192 and US\$126, respectively (Bamezai et al., 2005). Obviously, the cost of ED service in Taiwan is much lower than in America. In addition, common misconceptions and expectations of an integrative and prompt medical service in Taiwan have led to the number of ED visits continuing to grow in recent years. According to recent statistics of hospital medical services in Taiwan (Ministry of Health and Welfare, Taiwan, 2012), the number of emergency visits increased by 22.9% between 1999 and 2010. This trend of ED visits is rising faster than outpatient visits and surgery visits (see Figure 3.2). Ng et al. (2011) investigated patient acuity in a five-level ED triage system among 10,533 ED visits and found that only 4% of ED visits were classified as level one (resuscitation or immediate threat to life), while nearly 40% were non-urgent (level four or five). The large number of non-urgent visits may exacerbate the problem of ED overcrowding, and thus negatively influence the capability of advanced service provision and staff's physical and psychological tolerance (Bond et al., 2007; Sprivulis et al., 2006).



**Figure 3. 2 Profile of hospital medicine service visit by year**



Cited from: Ministry of Health and Welfare, Taiwan (2012)

In most hospitals, maintaining a flexible financial operation has become difficult since the implementation of the Global Budget Payment System to transfer the deficit finance from NHI to health care institutions. This payment system resulted in 33% of hospitals closing down between 1994 and 2008 (Hsu & Wu, 2009). The health care environment in Taiwan has become a competitive market. The restricted financial support means that hospitals may find it difficult to care for the health and wellbeing of HCWs.

Nevertheless, more attention to workplace health and safety in Taiwanese EDs is essential. The rights and general health of health care practitioners have been protected by the Taiwanese legislation for OHS since 1991 (IOSH, Taiwan, 2010); however, there has never been a requirement to report occupational accidents to the appropriate authority, unless the incident causes a death or an injury to more than three workers (Chu et al., 2010). Thus, occupational exposures in hospitals may be poorly detected, and the rights and wellbeing of hospital workers are more likely to be neglected or sacrificed. Alongside the characteristics of ED work, these challenges and difficulties make concerns for OHS among HCWs in EDs more significant than before. Hospital management must recognise

that, without the contributions of healthy and productive HCWs in EDs, the advanced emergency care service cannot be delivered properly. Hence, hospital efforts to improve the health and wellbeing of HCWs in EDs are an urgent priority, especially in the contemporary health care environment in Taiwan.

### ***3.4 Conclusion***

Much of the Taiwanese research until now has described the phenomenon of occupational exposure among HCWs. Fewer attempts have been made in Taiwan than in other countries to develop effective interventions to improve workplace health and safety in hospitals. In the Taiwanese context, the contemporary health care environment produces great challenges to the physical and psychological health of HCWs, particularly for those working in EDs. Although some OHS approaches operate well in Taiwanese hospitals to minimise occupational exposures, such as the EPINet and universal precautions for PCIs, current strategies to address workplace health and safety for HCWs seem inadequate to deal with multiple determinants. Moreover, due to restricted resources and funding, hospitals are now frequently in a dilemma to both provide a health care service to the public and create a healthy workplace for HCWs. In addition, the specific work demands and conditions of EDs create difficulty in controlling the risk of hazard exposure in ED workplaces.

Previously, no single study has comprehensively investigated the specific problems of workplace health and safety among HCWs in Taiwanese EDs. To bridge this gap in the current knowledge about the specific workplace issues related to health improvement and risk reduction for this group of workers, and to develop integrated risk interventions, a setting-based approach to address this complex ED workplace may be suitable. The following chapter will introduce the model of WHP as a setting-based approach to improve OHS among HCWs in Taiwanese EDs.

## **Chapter 4 Setting-based Approaches to Improve Workplace Health and Safety**

### ***4.1 Introduction***

Multiple interrelated determinants affect the OHS of HCWs in Taiwanese EDs. However, the specific issues related to their workplace health and safety remain unclear. It is appropriate to adopt a setting-based approach to comprehensively investigate the workplace issues and develop integrative interventions or strategies for health improvement and risk reduction for this group of workers. WHP is a setting-based approach that focuses on integrative strategies to address the combined influences of personal, environmental, organisational, community and societal factors on an employee's health (WHO, 2010a; 2010b). This chapter introduces the concept of health promotion, followed by an exploration of the integrative WHP model, with a focus on the factors that lead to successful program implementation. In addition, this chapter examines current applications and outcomes of health promotion in Taiwanese workplaces, as well as the gaps in program implementation to create healthy workplaces in Taiwanese hospitals.

### ***4.2 The concept of health promotion***

It is useful first to clarify the concept of health promotion. The health of individuals is attributed to the direct and indirect effects of various factors. Figure 4.1 illustrates the relationship between individual health and multiple interactive risk factors according to the socio-environmental model of health. In this model, Labonte (1997, pp. 16–18) explained that people living in risk conditions, such as having low social status and dangerous jobs, are more likely to experience less social support and low perceived power. These psychosocial experiences may increase physiological malfunctions, such as hypertension and heart diseases, while these physiological factors may compromise a person's ability to be active in community groups or the processes concerned with improving risk conditions. In addition, people experiencing socio-environmental risk conditions and psychosocial risk factors are more likely to engage in unhealthy behaviours, such as smoking, which reflects the absence of social support or a sense of

control and power in their lives. Further, unhealthy behaviours worsen the effects of physiological risk factors on health. The link between multiple interrelated socio-environmental determinants and health outcomes of individuals or populations are well explained in this model. In this regard, the concept of health promotion is developed to address the multi-causal nature of health via a range of different, but complementary, approaches to improve health (WHO, 2010a).

**Figure 4. 1 A model of health determinants**

Cited from: Labonte (1997, p.13)

The initiative of health promotion enables people to increase control over and improve their health through a wide range of social and environmental interventions (WHO, 2010a). The five strategies set out in the Ottawa Charter (WHO, 2010a) for health promotion are essential for success. These strategies are building healthy public policy, creating supportive environments, strengthening community actions, developing personal skills and reorienting health services. The explanation of each strategy is as follows.

#### **4.2.1 Build healthy public policy**

Health promotion goes beyond health care. It places health on the agenda of policymakers in all sectors and at all levels, directing them to be aware of the health consequences of their decisions and to accept their responsibilities for health. Health promotion policy combines diverse, but complementary, approaches, including legislation, fiscal measures, taxation and organisational changes. It is coordinated action that leads to health, income and social policies that foster greater equality. Health promotion policy requires the identification of obstacles to the adoption of healthy public policies in non-health sectors, and provides ways of removing these obstacles.

#### **4.2.2 Create supportive environments**

The inextricable links between people and their environment constitutes the basis for a socio-ecological approach to health. The overall guiding principle for the world, nations, regions and communities, alike, is the need to encourage reciprocal maintenance—to take care of each other, our communities and our natural environment. Changing patterns of life, work and leisure have a significant effect on health. Work and leisure should be a source of health for people. The way society organises work should help create a healthy society. Health promotion generates living and working conditions that are safe, stimulating, satisfying and enjoyable.

#### **4.2.3 Strengthen community actions**

Health promotion works through concrete and effective community action to set priorities,

make decisions, and plan and implement strategies to achieve better health. At the heart of this process is the empowerment of communities—ownership and control of their own endeavours and destinies. Community development draws on existing human and material resources in the community to enhance self-help and social support, and develop flexible systems to strengthen public participation in, and the direction of, health matters. This requires full and continuous access to information, learning opportunities for health, and funding support.

#### **4.2.4 Develop personal skills**

Health promotion supports personal and social development through providing information, providing education for health, and enhancing life skills. By so doing, it increases the options available to people to exercise more control over their own health and environment, and to make choices conducive to health. It is essential to enable people to learn throughout life to prepare themselves for all of life's stages and to cope with chronic diseases and injuries. This has to be facilitated in school, home, work and community settings. Action is required through educational, professional, commercial and voluntary bodies, and within the institutions themselves.

#### **4.2.5 Reorient health services**

The responsibility for health promotion in health services is shared among individuals, community groups, health professionals, health service institutions and governments. They must work together towards a health care system that contributes to the pursuit of health. The role of the health sector must move increasingly in a health promotion direction, beyond its responsibility for providing clinical and curative services. Reorienting health services also requires stronger attention to health research, as well as changes in professional education and training. This must lead to a change of attitude and organisation of health services that refocuses on the total needs of the individual as a whole person.

The Ottawa Charter was an important milestone towards integrative approaches to promoting health. Building on this, the 1997 Jakarta Declaration emphasised the value of setting-based approaches for implementing comprehensive strategies to address the challenges of promoting health in the twenty-first century (WHO, 2010a). The workplace is one of the priority settings for health promotion.

### **4.3 WHP**

The influence of the workplace on occupational health is significant. As discussed in Chapter 2, a variety of workplace determinants can directly cause occupational injuries or diseases. Nevertheless, a workplace can provide a wide range of resources to improve health. To create ‘healthy people in healthy organisations’, the WHO-WPRO (1999) listed the aims of a healthy workplace, including:

- creating a healthy, supportive and safe work environment
- ensuring that health promotion and health protection become an integral part of management practice
- fostering work styles and lifestyles conducive to health
- ensuring total organisational participation
- extending positive effects to the local and surrounding community and environment

In the European Union, the Luxembourg Declaration on Workplace Health Promotion is also recognised as important for a setting approach. The principles set out in this declaration state that organisations should include:

- company codes of conduct and guidelines that view employees not merely as cost factors, but as important success factors
- a company culture and management policies that include the participation of employees, and encourage them to assume responsibility



- a work organisation that enables employees to balance the demands made by the job with their own personal skills, and to control their own work and social support
- personnel policies that incorporate health targets into all other areas of the company
- integrated OHS services
- inclusion of employees in health issues at all levels (participation)
- systematic implementation of all measures and programs (project management)
- linking risk reduction strategies with the development of safety factors and health potentials (a comprehensive approach) (ENWHP, 2007)

#### **4.3.1 Determinants of workplace health**

Workplace health is profoundly affected by multiple interrelated determinants. WHO (2010b) stated that a healthy workplace requires workers and managers to collaborate in a continual process to protect and promote the health, safety and wellbeing of all workers, and the sustainability of the workplace. It does this by considering the needs of health and safety in the physical and psychosocial work environment, as well as personal health resources in the workplace, and ways of increasing community participation to improve health. This definition expands the determinants of occupational health from an almost exclusive focus on the physical work environment to extensive psychosocial and personal health practice factors (WHO, 2010b). Figure 4.2 illustrates the multiple and overlapping determinants of workplace health. Brief descriptions of each determinant are provided below (WHO, 2010b).

##### *4.3.1.1 The physical work environment*

The physical environment refers to the structure, materials and production process in the workplace. Problems related to the physical work environment typically include:

- chemical hazards (such as solvents, pesticides and tobacco smoke)
- physical hazards (such as noise, radiation and excessive heat)
- biological hazards (such as Hepatitis B, HIV and TB)

- ergonomic hazards (such as awkward posture, repetitive motions and heavy lifting)
- mechanical hazards (such as machine hazards related to nip points, cranes and forklifts)
- energy hazards (such as electrical injury)
- mobile hazards (such as driving on ice, in rainstorms or in unfamiliar or poorly maintained vehicles)

#### *4.3.1.2 The psychosocial work environment*

The psychosocial environment includes organisational culture, attitudes, values, beliefs and daily practices in the workplace. Factors that are often recognised as workplace stressors include:

- poor work organisation (problems with work demands, time pressure, decision latitude, support from supervisors and communication styles)
- organisational culture (lack of policies and practice related to respect for all workers, harassment and bullying, and lack of support for healthy lifestyles)
- command and control management style (lack of negotiation, consultation, constructive feedback and respectful performance management)
- lack of support for work–life balance
- fear of job loss

#### *4.3.1.3 Personal health resources in the workplace*

Personal health resources include the health service, information, opportunities, support and motivations provided in the workplace to improve or maintain health. Employment conditions may make it difficult for workers to adopt healthy lifestyles or remain healthy.

These negative conditions can include:

- physical inactivity, which may result from long work hours, high cost of fitness facilities or equipment, and lack of flexibility regarding the timing and length of breaks

- poor diet, which may reflect lack of access to healthy snacks or meals at work, lack of time to take breaks for meals, lack of refrigeration to store healthy foods, or lack of knowledge
- smoking, if it is allowed or enabled by workplace environments
- illnesses, which may remain undiagnosed or untreated due to lack of accessible, affordable primary health care

#### *4.3.1.4 Enterprise community involvement*

Enterprises affect the communities in which they operate, and are affected by their communities. Enterprise community involvement refers to the activities in which an enterprise might engage or the expertise and resources it may provide to support the social and physical wellbeing of a community in which it operates. This particularly includes factors affecting the physical and mental health, safety and wellbeing of workers and their families.

### **Figure 4. 2 Determinants of workplace health**

Cited from: WHO (2010b)

In addition, the WHO in the Western Pacific Regional Network for the development of healthy workplaces indicates six major determinants of a healthy workplace. A brief description of each determinant is below (WHO-WPRO, 1999).

#### I. Workplace policy

A workplace health policy is recognised as a commitment to the health of workers by addressing the whole range of health factors. Moreover, it justifies the allocation of resources to efforts of workplace improvement, and guides the actions to deal with particular health issues.

#### II. Organizational environment

The organisational environment refers to the culture of an organisation, which includes leadership and management style, communication and teamwork, opportunities for professional and social development, protection from occupational exposure to hazards, empowerment and accountability, and reward for good work. In addition, the structure and sequence of work tasks—such as types of work, workloads, speed of work process and rotating shifts—have a profound effect on workers' health and safety.

#### III. Physical environment

The physical environment includes buildings, equipment, materials and work processes, both indoors and outdoors. Adherence to the principle of 'hierarchy of controls' in terms of engineering controls, administrative controls and use of PPE is required for hazard reduction in a workplace.

#### IV. Lifestyles and personal health skills

Personal lifestyle and behaviours, particularly in the areas of diet, exercise, stress, smoking and alcohol abuse, can multiply the negative health effects of multiple risk factors in the workplace. For example, workers who are exposed to asbestos and who also smoke are much more likely to develop lung cancer than asbestos-exposed workers who are non-smokers.

## V. Health service

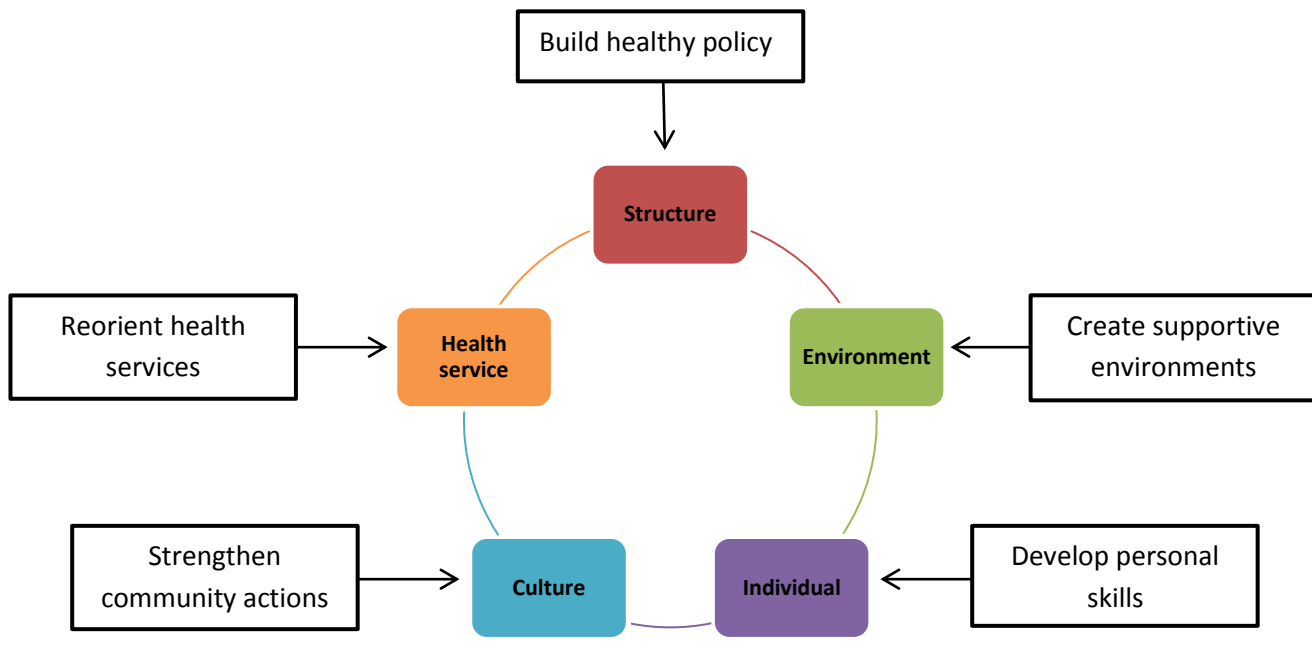
Onsite health services enable workers to access primary and preventive care, and play an important role in the management of occupational injuries and diseases.

## VI. Effect on the external environment

Workplaces are not isolated from the external environment. Problems in the external environment, such as pollution, energy consumption, waste and recycling, can detract from the health and safety of the workplace.

According to these two WHO documents (WHO, 2010b; WHO-WPRO, 1999), the determinants of workplace health may need to be integrated to encompass structural, environmental, individual, cultural and health service aspects. A healthy workplace acknowledges all the elements influencing workers' health in developing relevant policies and programs to improve the health and wellbeing of its workers (WHO-WPRO, 1999). Figure 4.3 illustrates an integrative approach that comprises the five strategies of the Ottawa Charter to address different determinants of workplace health and safety.

**Figure 4. 3 An integrative strategy to address multiple determinants**



Realigned from: WHO (2010a; 2010b), WHO-WPRO (1999)

#### **4.3.2 The importance of combining WHP with OHS**

The role and condition of a workplace is significant in the health improvement of employees. The workplace offers an ideal setting and infrastructure not only to reduce the risk of hazards exposure, but also to promote the concept and implement the programs of health promotion for the following reasons:

1. Structures already exist within the workplace for OHS requirements. These can be easily used to deliver health promotion activities.
2. The workplace offers enormous potential to reach large numbers of people with information and assistance to improve their health and wellbeing. Some of these people are in groups that are otherwise hard to reach.
3. It is in the common interest of employers and employees to promote health at work.
4. Forward-thinking organisations recognise that the management of their human capital is equally important to, if not more important than, the management of

their financial and other resources. Employee health and fitness for work are closely linked and are key factors in any organisation's drive towards greater effectiveness, competitiveness and productivity (ENWHP, n.d.a).

Successful WHP offers greater health and wellbeing for individual workers. It also provides organisations with financial benefits through reducing absenteeism, turnover, direct and indirect medical expenditures, and improving productivity and competitiveness (Baicker et al., 2010; ENWHP, n.d.b; Goetzel & Ozminkowski, 2008; WHO-WPRO, 1999). Table 4.1 lists the benefits of a healthy workplace to the organisation and employees.

**Table 4. 1 Benefits of a healthy workplace**

Cited from: WHO-WPRO (1999)

Regrettably, WHP has been poorly integrated into the legislation and practice of OHS. Hymel et al. (2011) discussed workplace health protection and promotion and argued that the programs of OHS and WHP have operated independently in the workplace. This is because health protection has often been seen as the programs that protect workers from occupational exposures, ranging from basic safety training to work environment modifications. In contrast, WHP has been viewed as activities that maintain or improve

personal health, ranging from health assessments to wellness initiatives. Mainstream OHS endeavours seek to ensure the health of workers, while also contributing to productivity, work motivation and job satisfaction (WHO, 2004). In fact, WHP has the consistent purposes of OHS in addressing the best benefits to both organisations and employees. Therefore, WHP should be included in OHS programs to enhance the best outcomes of health improvement and risk reduction in the workplace.

#### **4.3.3 The evolution of WHP**

Reflecting changes in understandings of health determinants, the concept and development of WHP has undergone an evolutionary process, moving from a focus on individual behaviour modifications to a comprehensive and integrative consideration of the broader social, environmental and organisational determinants of health (Chu et al., 1997; Chu & Dwyer, 2002) (see Figure 4.4).



#### **Figure 4. 4 Four generations of WHP**

Source: Chu et al. (1997); Chu & Dwyer (2002)

Figure 4.4 suggests that the evolutionary process of WHP has moved from merely relying on individual behavioural changes, to integrated organisational approaches, by changing the environment, culture and management of the workplace to address workers' health and wellbeing. The programs of WHP cover health promotion, disease prevention, occupational hazard reduction, safety management and organisational development (Chu & Dwyer, 2002). A recent study by Baicker et al. (2010) reported that contemporary workplace disease prevention and wellness programs focus on health risk assessment, self-help education materials, individual counselling, classes/seminars and group activities, as well as incentives to increase the participation of employees. Among these, health risk assessment is the most frequently used method of WHP delivery. Nevertheless, in some cases, WHP has remained an attempt to modify individual behaviours without considering the effects of working conditions on workers' ability to adopt and sustain healthy behaviour (Noblet & LaMontagne, 2006). Noblet and LaMontagne (2006)

criticised such individual-orientated approaches for blaming the victim for having inadequate knowledge and skills. In addition, an individual behavioural approach may force workers to adjust to adverse working conditions. This can breach OHS legislation because employers have the responsibility to protect workers from potential hazards by checking and changing working conditions. Table 4.2 indicates the differences between individual behavioural modifications and integrative organisational approaches for WHP (Baum, 2002, p. 381).

**Table 4. 2 A comparison of behaviourally driven health promotion and organisational approaches**

Cited from: Baum (2002, p. 381)

**4.3.4 Planning and implementation WHP**

Although the purpose of WHP is to address the best benefits for both individual workers and organisations through effective risk reduction and health improvement, the models of

planning and implementation for WHP can be different, depending on interpretations about responsibility for personal health, as well as countries' policies (Burton, 2010). This section describes the models in America, Finland and the region of the Western Pacific.

In America, the systematic process of building a WHP program emphasises four steps:

**Step 1: Workplace health assessment.**

An assessment defines factors in the levels of individual, work environment and organisation that can influence employee health. This assessment presents current workplace health activities, as well as capacity and needs for workplace health improvement.

**Step 2: Planning the program.**

This requires a basic governance structure or infrastructure to administer and manage health promotion activities. Moreover, determining program goals, selecting priority interventions, and building organisational support are essential for developing a workplace health program.

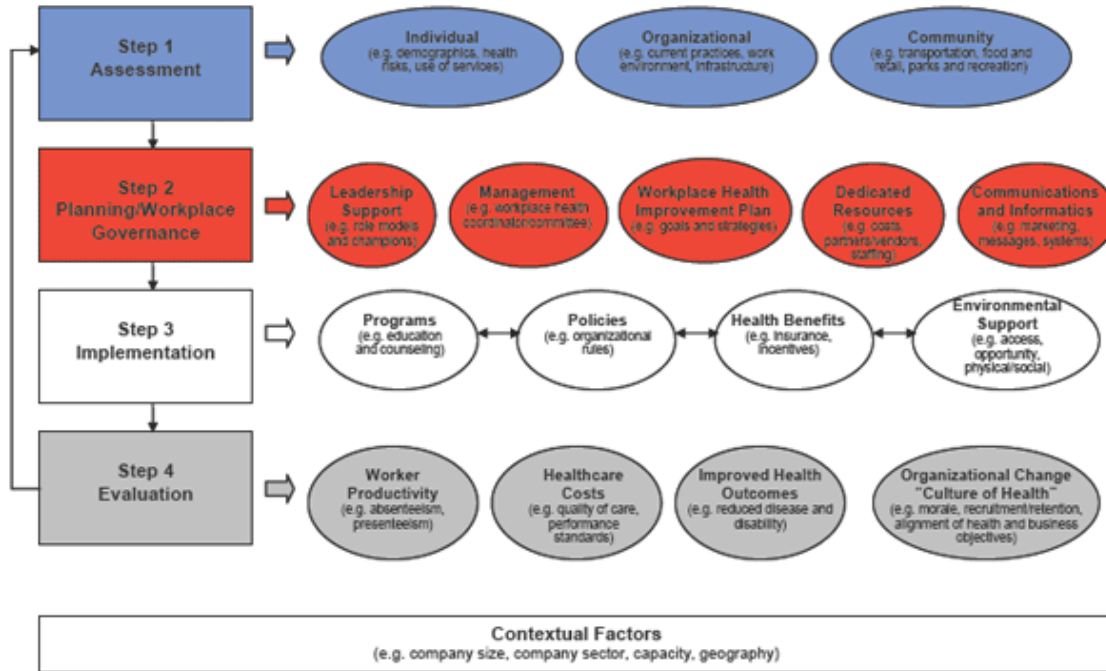
**Step 3: Implementing the program.**

Program implementation must involve strategies and interventions at different levels of the organisation, and make them available to employees.

**Step 4: Determine effect through evaluation.**

This evaluation should focus on a continuous quality improvement loop to improve and strengthen existing activities, identify potential gaps in current offerings, and describe the efficiency and effectiveness of the resources invested for organised health promotion activity (see Figure 4.5) (CDC, US, 2013).

**Figure 4. 5 Workplace health model**



Cited from: Division of Population Health/Workplace Health Promotion (CDC, USA, 2013)

‘Maintenance of workability’ in Finland is one example of an integrative approach to deal with traditional workplace hazards and improve general health issues in the European Union (Finnish Institute of Occupational Health, 2010). This model contains four steps:

#### Step 1: Preparations

- the commitment of all parties, including employees, supervisors and management, is necessary
- a group responsible for planning, supporting and undertaking the activities is nominated
- it is good practice to document the decision to begin

#### Step 2: Planning

- a plan of WHP describes the aims, targets, responsible actors, timetable, follow-up and evaluation of the program

- it is essential to collect information about the individuals' health, workplace hygiene and safety, organisational health services, training needs, and available programs

#### Step 3: Realisation

- it is useful to divide the planned activities into smaller processes to be realised according to an agreed timetable
- WHP should be an integral part of the everyday routines in the workplace
- the process should reach everyone, and everyone should have an opportunity to contribute
- a work group can improve their internal cooperation, mutual support and communication to achieve better information exchange and a better organisation climate

#### Step 4: Follow-up and evaluation

- continuous monitoring of the progress and results form the basis for evaluation and improvements
- evaluation of the outcomes may be either formal or informal
- a systematic evaluation of the program provides information to reach the goals not yet achieved

It is important to recognise different approaches to workplace health between the US and Europe. In 2010, Burton published a paper in which he mentioned that, in the US, employers have a significant role in providing and paying for health care for their employees due to inequity in access to primary health care. To reduce the health care costs that employers must bear, WHP in the US tends to focus on addressing traditional OHS in response to strong labour legislation, and encourages employees to develop healthy lifestyles on an individual basis. In comparison, the approach for WHP in Europe is more comprehensive because it combines the efforts of individual workers, employers and communities to improve the health and wellbeing of employees (Burton, 2010).

Similar to the integrative approaches for WHP in the European Union, the Western Pacific Region of the WHO has also suggested an eight-step process to address the

principles of the approach being comprehensive, participatory, empowering, multi-sectoral, multidisciplinary, cooperative, socially just and sustainable (WHO-WPRO, 1999). The guideline points out that gaining management support for the initiative and commitment to change is the initial and necessary step in this process. The next step is establishing a coordinating team that involves representatives from all levels and sectors in order to prioritise the needs and provide support for program development and implementation. Conducting a workplace needs assessment is the core part of the process. In this stage, relevant data are collected to identify potential health risks or concerns, and to generate the interest of stakeholders. The committee then prioritises the problems and interests to develop and implement an action plan, including achievable goals, objectives, strategies, activities, budgets and timetables according to the available resources and special concerns. Finally, a process and outcome evaluation is conducted to determine how well the program is progressing. The evaluation findings facilitate redesigning the program, or become the basis of a new action planning cycle (WHO-WPRO, 1999). Figure 4.6 shows the planning and implementation cycle of this eight-step process.

#### **Figure 4. 6 Planning and implementation cycle**

Cited from: WHO-WPRO (1999)

The Jakarta Declaration stated that comprehensive approaches that use combinations of the five strategies in the Ottawa Charter for health promotion are more effective than single-track approaches (WHO, 2010a). Moreover, since the current study is conducted in Taiwan, the model of integrative approaches for WHP guided by the Western Pacific Region will be applied. The next section discusses the core parts of this model.

#### **4.3.5 The components of a comprehensive needs assessment in workplaces**

In the model of WHP guided by the Western Pacific Region, conducting a comprehensive needs assessment is crucial because it provides the basic information and rationale for the

successful planning and implementation of programs to address workplace health and safety.

A needs assessment is a systematic process to determine the gap between the real and desired conditions, which includes defining the issues, investigating causations and determining possible solutions (Gupta, 2007, p. 14–15). In 1972, Bradshaw (cited in Robinson & Elkan, 1996, p. 20–21) defined four types of needs: normative needs, felt needs, expressed needs and comparative needs. At the practical level, these four types of needs offer a useful framework to gather information for a comprehensive understanding of a workplace (Chu, 2009, p. 24–25). Chu (2009, p. 24–25) described these needs as follows.

#### *4.3.5.1 Normative needs*

Normative needs are often defined by experts based on research or considered opinions. Normative needs are related to established standards or guidelines developed through experience and consultation.

#### *4.3.5.2 Felt needs*

Felt needs are defined by workplace members themselves. Information on felt needs can be gathered through community consultation methods, such as focus group discussions, informal interviews and questionnaire surveys. Importantly, this process provides opportunities for community members to actively participate in workplace needs assessment.

#### *4.3.5.3 Expressed needs*

Expressed needs are often inferred by examining service use records, such as the usage of recreational facilities, or occurrences of workplace injury and absenteeism. In addition, through workplace observation, actual and real needs can be revealed. This is because expressed needs not only relate to a function of service availability, but are also close to the interests of the more powerful sub-groups of the community, rather than a whole community. Hence, expressed needs may not directly link to felt needs.



#### *4.3.5.4 Comparative needs*

Comparative needs can be obtained through literature reviews, secondary data or case study reports to examine the similarities and differences in health issues, solutions, services and determinants between comparable populations, organisations or communities. Thus, the problems of occupational exposure can be predicted, or sustainable policies and strategies can be learnt from other workplaces with similar characteristics and developmental stages.

Further, a comprehensive needs assessment collects data about a workplace profile, health and safety record and summary of the needs and concerns of members of the workplace (WHO-WPRO, 1999). Details of each element are presented below:

- **Workplace profile:**  
The workplace profile provides details about the workforce, physical working environment, organisational issues, work processes and available resources for health (see Table 4.3).
- **Health and safety record:**  
The relevant data are compiled and reviewed, including the health status of the workforce, results of occupational health screening, figures of occupational morbidity and mortality, statistics of occupational injuries and compensation, details of accidents taking place, and records of environmental inspection and training provided.
- **Perceptions of members in the workplace:**  
It is essential to ascertain the perceptions regarding workplace needs and priorities among people related to a workplace, including workers, employers, health service providers, and occupational and health promotion experts (WHO-WPRO, 1999).

**Table 4. 3 The components of workplace profile**

Cite from: WHO-WPRO (1999)

A comprehensive needs assessment is the core and essential part of WHP because it provides a broader range of information for program design and direction. The assessment may focus on key workplace problems identified by employees or employers, or may include a more extensive analysis of the work environment, OHS records and input from health practitioners and occupational health experts (WHO-WPRO, 1999). Chu et al. (1997) suggested an integrative framework for baseline data collection at a specific workplace to assess health needs and evaluate outcomes of WHP programs (see Table 4.4).

**Table 4. 4 An integrative framework for evaluation and workplace needs assessment**

Cited from: Chu et al. (1997)

#### **4.3.6 International successful examples of integrative WHP**

The main objectives of a healthy workplace are not only to make it free of hazards, but also to enable employers' and employees' cooperation to create a supportive environment and workplace culture to improve workers' health and wellbeing, and ensure quality and productivity of work (Chu et al., 2000; WHO, 2010b; WHO-WPRO, 1999). The regional networks of WHO, particularly in Europe and the Western Pacific, have provided many successful projects for integrative WHP (ENWHP, n.d.b; WHO-WPRO, 1999). This section presents three international cases of successful worksite health promotion. Case study one, from the Western Pacific Regional Network, is the experience of four industries in Shanghai that improved the working environment and workers' health (see Box 4.1). Case study two, from the European Network, is the experience of WHP in Nike in Belgium (see Box 4.2). In addition to these two regions, case study three, from British Columbia, Canada, is a successful program to address cost benefits and OHS problems specifically in the health care sector (see Box 4.3).

#### **Box 4. 1 Healthy workplace project in Shanghai, China**

##### Background

Shanghai is the largest industrial city and economic centre in China. It is faced with many adverse health issues, such as environmental pollution, occupational health risks and the threat of communicable diseases. These issues pose a significant threat to the health of the city. In response to these issues, between 1993 and 1995, the Shanghai Health Education Institute, Ministry of Health and WHO launched a pilot project concerning worksite health promotion to create a healthy working environment, encourage healthy lifestyles and reduce the risks of occupational exposure. Four different industries were selected to participate, namely shipbuilding, metallurgy, textile and chemical manufacturing.

##### Program implementation

1. Firstly, a centralized steering committee was established to manage and guide the program implementation.
2. Data were collected from surveys and focus group discussions to establish baseline data and guide the development of an action plan.
3. Worksite plans were developed according to the workers' health needs focusing on promoting healthy lifestyles (smoking and drinking behaviours), controlling common diseases (hypertension, ulcers, laryngitis and cervical erosion), reducing occupational health risks (exposure to noise, carbon monoxide, silica and cotton dust), improving the general work environment (expanded green space) and strengthening basic and occupational health services.
4. Finally, the project outcomes were evaluated.

##### Significant outcomes

- ✚ reduced smoking rates and increase in physical exercise among males
- ✚ decreased noise and dust levels
- ✚ development of health-promoting policies (smoking, occupational protection and diet)
- ✚ reduced salt content in canteen food
- ✚ improved health services (hypertension management program)
- ✚ cleaner environment (improved toilet facilities and waste disposal)
- ✚ decreased prevalence of target diseases (ulcers, laryngitis)
- ✚ integration of health promotion and protection into ongoing management practices

Source from: WHO-WPRO (1999)

#### **Box 4. 2 Good practice model of WHP in NIKE, Belgium**

##### Background

NIKE is a company producing sports goods and materials which has 1500 employees in Belgium. It has corporate principles that include WHP for continuous improvement in working conditions.

##### Program implementation

- The NIKE company determines the need for health-related activities on the basis of regular analyses of absenteeism and industrial accidents.
- A risk management team was formed to provide the various health-related activities and programs, and to inform all employees about the details.
- The results of a regular survey about working conditions were incorporated into a program designed to improve working conditions and individual behaviour.
- The health centre informed the employees about their general health status, and provided a fitness program for them.
- All the employees received training about back health, which includes practical training in lifting techniques and theory.
- The WHP programs at NIKE are subject to constant quality checks.

##### Significant outcomes

- ✚ The continuous training process for back health is regarded as a very effective measure to prevent accidents, strains and illnesses among employees.
- ✚ An increasing number of employees feel completely fit and healthy, and more than 20% of employees participate in activities to promote their health.
- ✚ Absenteeism, days lost due to illness, and industrial accidents have fallen dramatically at NIKE.

Source from: ENWHP (n.d.b)

#### **Box 4. 3 A successful program of WHP in the health care sector in British Columbia, Canada**

##### Background

Health care workplaces are complex and dangerous, and induce high rates of work injuries, illnesses and absences from the work, and increased difficulties in recruitment and retention of health care practitioners. In British Columbia, the average injury rate in the health care sector was higher than for all other industries. More than 10% of nursing assistants sought professional help for mental health problems, compared to 7% of other Canadians in 2001. The incidence of exposures to biological, chemical, physical ergonomic and psychological hazards among HCWs was escalating costs in Canada's health system.

##### Program implementation

- The Occupational Health and Safety Agency for Healthcare (OHSAH) was formed to share concerns related to increasing injury rates and their financial impacts, as well as to consolidate efforts to address workplace issues from the perspective of both employers and the individual workers.
- The needs assessment identified musculoskeletal disorders (MSDs) resulting from patient handling as the top cause of morbidity and time loss from work. Initiatives to prevent MSD included developing a “no lift” policy and best practice guidelines, as well as promoting a culture of safety, improving physical / environmental conditions.
- The prevention and early active return-to-work safely (PEARS) program provided funding to integrate primary and secondary prevention, and combined local best practice with what has been shown to work in other jurisdictions.
- A web-based incident tracking system provided healthcare stakeholders with comprehensive performance indicators on workplace health and safety.
- Community Alliance for Health Research (CAHR) contributed to the development of healthy lifestyles and policy. Some of the initial research programs were: an exploration of work organizational factors and their influence on injury rates in care settings; a study of decision-making regarding substitution of toxic chemical substances; and an evaluation of ceiling-mounted lifting devices and other lifting aids to reduce MSDs.

##### Significant outcomes

- ✚ The incidence of lift / transfer injuries decreased by about 60 %, and the costs were reduced by about 70%.
- ✚ The injury rates fell about 30%, time losses due to injuries fell about 40%, and the cost savings totalled over \$51 million to the healthcare sector between 2002 and 2004.



✚ Programs were expanded to better meet stakeholder needs, and offered a range of other models including incident investigations, inspection, hazard & risk identification, prevention of violence in the workplace, and interest based problem solving.

Source from: Yassi (2005)

The experience of these case studies suggests that the key to successful WHP is an integrative approach to meet the needs of stakeholders, and reinforce the outcomes of OHS. The ENWHP (2001) summarised the typical factors for a successful WHP as follows:

1. workplace health action should be based on an analysis of the health requirements and needs of an enterprise
2. health actions should involve all stakeholders in the enterprises, especially the workers, and representatives of intermediary organisations (a participative approach)
3. WHP actions should seek to improve the quality of working life and conditions, as well as focusing on the behaviour of the individual worker
4. workplace health action should become an integral part of management practices and daily working life at all levels of an enterprise

As mentioned earlier, an evolutionary process has led to the model of WHP moving from individual behaviour modification towards an integrative organisational approach to address the best interests of employees and employers. The model of WHP seems to be a useful measure to address OHS among ED workers in Taiwan. Before employing this model, it is necessary to understand current outcomes of WHP implementation in Taiwan.

#### ***4.4 Outcomes of WHP implementation in Taiwan***

In the Jakarta Declaration on Health Promotion, a setting-based approach is seen as crucial for holistic and sustainable health improvement (WHO, 2010a). The typical advantages of WHP not only prevent occupational exposures and promote the concept of

healthy lifestyle and behaviours, but also facilitate organisational development (Whitehead, 2006). Following the international movement, the concept and programs of WHP have been launched in Taiwan, but the outcomes and implementation appear to be limited (Hsu, Lin et al., 2009; Lin & Lin, 2011). This section examines current efforts and challenges of program design and implementation in workplaces. Most importantly, it explores the barriers to implementation of WHP in hospitals.

#### **4.4.1 Challenges for effective WHP implementation in Taiwan**

The scope of WHP has expanded from changing the particularly risky practices of individual workers to proactively promoting health by considering multiple health determinants, workers' participation and empowerment, and multi-sectoral and multidisciplinary cooperation in program design to respond to the needs of workers (Chu et al., 1997; WHO-WPRO, 1999). Although the Taiwan Bureau of Health Promotion (2011) has undertaken a series of programs designed to address an integrative improvement of health and wellbeing in the workplace, some significant gaps in current planning and implementation of WHP exist.

First, the initiative of WHP has not been fully implemented in Taiwan. A cross-sectional study by Hsu, Lin et al. (2009), investigating the perception of WHP among employees of 30 workplaces in Taiwan, found that, despite the improvement of personal health skills, the responses indicated low scores of perception with respect to the workplace health policy, supportive environment and effectiveness of WHP activities and services. This study may indicate the need for more comprehensive approaches and better multi-sectoral and multidisciplinary cooperation in program design in order to enhance the effectiveness of WHP.

Second, the program design lacks flexibility or choices to address the specific needs of the target population. The programs of WHP are generally designed on an organisational level in coordination with the trend or movement proposed by the Bureau of Health Promotion, such as tobacco hazards prevention and weight management. Huang et al.

(2012) argued that the prevalence of health problems among workers is not uniform, but varies in different occupational categories. For instance, machine operations are more likely to suffer from muscle pain, while a high prevalence of psychological stress is found among technical workers. Addressing specific health issues among workers is essential for effective workplace health improvement. In addition, lacking consideration of workers' opinions in program design is another issue that challenges WHP implementation. One significant example is that workers are frequently required to attend a healthy lifestyles seminar after work, regardless of their tiredness and eagerness to go home (Fan & Yen, 2008). This situation may lead to employees being reluctant to participate in WHP programs. To ensure that the specific concerns and problems about workplace health and safety among different groups of workers can be effectively addressed, a detailed needs assessment of the nature of the workplace settings, as well as the perceptions of employees, should be taken into account in planning sustainable WHP programs.

Third, WHP is incorporated into the legislations of workplace health and safety in Taiwan. However, lacking effective auditing standards has caused employers to evade responsibility, and has reduced their intention to promote the health of employees (Fan & Yen, 2008).

These issues indicate that current WHP implementation in Taiwan has lost sight of the importance of a comprehensive approach, workers' participation and multidisciplinary cooperation, as well as development of sustainable programs to respond to the needs of workers. These can be significant barriers to achieving the expected outcomes of WHP. In consequence, workers may be reluctant to participate in WHP activities, and enterprises may implement the programs without appreciating the purpose and importance of WHP.

#### **4.4.2 Challenges for implementing WHP in hospitals**

As a working environment, hospitals are rife with various physical, chemical, biological and psychosocial hazards. From the perspective of a setting-based approach, adopting

WHP to comprehensively deal with the problems of working conditions and hazard exposure in hospitals seems reasonably feasible. Nevertheless, a hospital in Taiwan may face more challenges than other workplaces in attempting to practise the model of WHP.

Similar to other workplaces, poor consideration of specific needs among health care practitioners in program design and plan is a significant barrier to implementing effective WHP in hospital settings. Chiou et al. (2013) conducted a national study to investigate health issues among hospital nurses in Taiwan and found that workplace hazards were common, but varied among nurses working in different units. For example, nurses working in EDs/intensive care units and wards reported worse health status and more depressed moods than nurses in other units. They indicated that WHP programs in hospitals should seriously consider different workplace needs in order to improve health status and reduce work-related hazards for their staff.

A successful WHP recognises the differences between workplaces (WHO-WPRO, 1999). This means that a hospital manager's commitment and support for the program development to address specific needs is a crucial and essential determinant for the development of WHP. Nevertheless, as stated in Chapter 3, the executives in hospitals may be reluctant to devote too many resources to activities that are not part of the core mission of quality and advanced health care for the public, in order to survive in the competitive health care marketplace. A national cross-sectional study in Taiwan (Lin & Lin, 2011), examining the outcomes of health promotion in hospitals, argued that the restricted financial investment in health promotion for patients, staff and the community has led to the health promotion budget for HCWs being limited. They emphasised the barriers of organisational support for funding to address health improvement and risk reduction through worksite health promotion programs for HCWs.

Hospitals are obviously institutions with a large number of workers and service users that can address a large section of the population's health (WHO-Europe, n.d.). The setting-based approach for health promotion diversifies the roles of a hospital. Having discussed the barriers to implementing health promotion for HCWs in hospitals, it is essential to

examine the achievements of promoting health and wellbeing of HCWs in health-promoting hospitals (HPHs). HPHs are regarded settings with different roles and functions of health promotion. They are not only providers of health services; institutions for training, education and research; and advocates of health promotion in the community, but are also models for developing a healthy organisation and workplace for health care practitioners (Pelikan et al., 2001).

To ensure effective health care practice and service delivery for patients, staff and the community, HPHs in Taiwan have exercised a wide range of activities and interventions to meet the five standards for health promotion in hospitals suggested by the WHO network of HPHs. These five standards are as follows:

1. The organisation must have a written policy for health promotion. This policy is implemented as part of the overall organisation quality improvement system aimed at improving health outcomes. This policy is aimed at patients, relatives and staff.
2. The organisation must ensure that health professionals, in partnership with patients, systematically assess needs for health promotion activities.
3. The organisation must provide patients with information on significant factors concerning their disease or health condition, and health promotion interventions must be established in all patient pathways.
4. The management must establish conditions for the development of the hospital as a healthy workplace.
5. The organisation must have a planned approach to collaborate with other health service providers and other institutions and sectors on an ongoing basis (WHO-Europe, 2006).

Among these standards, the fourth clearly states that the duty of HPHs is to create a healthy workplace for their staff. Regrettably, current efforts in this aspect remain inadequate. Lin et al. (2009) explored the achievements of HPH in Taiwan and found that hospitals perform better in providing health information and health promotion activities to patients, rather than creating a healthy workplace for their employees. In addition,

current projects of health promotion for HCWs tend to focus on lifestyle changes to address health issues related to obesity, metabolic syndrome and physical fitness, followed by management of abnormal health, such as hypertension and smoking cessation (Lee, Chen & Chu, 2012). These studies indicate that the majority of hospitals may lose sight of the significant fact that occupational hazards in hospitals have a worse direct effect on staff health than some lifestyle health problems, such as being overweight and smoking.

It is acknowledged that hospitals take every effort to improve the health status of HCWs. However, as a workplace, the major responsibility of a hospital is to minimise the occupational injuries and accidents resulting from the work. In addition, the gradual rise in prevalence of incidents among HCWs has been clearly demonstrated (Council of Labor Affairs, Taiwan, 2012). Designing interventions to effectively reduce occupational exposures should be the priority in promoting a healthy workplace in HPHs. Following the global trend of setting-based health promotion movement, a growing number of hospitals have engaged in the Taiwanese HPH network since 2006. The programs of health promotions that target employees have become popular in hospitals, even though some hospitals do not belong to the network of HPH. This offers an opportunity to draw more attention to promoting healthy situations and environments for HCWs through worksite health promotion programs in hospitals.

#### ***4.5 Conclusion***

Research and case studies from around the world provide convincing evidence that WHP is effective in achieving greater health and risk management, since it emphasises multidisciplinary cooperation and an integrative approach that considers building healthy policy, creating supportive environments, developing personal skills, strengthening community actions, and reorienting health services to create a healthy and safe workplace for staff. The direct benefits of a healthy workplace are in the interest of not only staff members, but also organisations because of the desirable outcomes of hospital productivity and community health.

In the Taiwanese context, the setting-based approach of health promotion has been accepted in hospitals to improve the health of patients, communities and staff. Regrettably, current program designs have lost sight of the importance of establishing healthy working conditions and a healthy environment for HCWs. Even though certain programs that seek to create individual lifestyles changes have been implemented, a lack of clarity about workplace needs among specific groups of workers, as well as restrictions on funding, may compromise the anticipated outcomes of WHP in hospitals. Fortunately, the popularity of health promotion programs in contemporary Taiwanese hospitals offers an opportunity to create a healthier workplace for HCWs through WHP. Thus, applying the model of WHP to promote occupational health and reduce hazard exposure for ED HCWs in Taiwan could be feasible.

## **PART 2: STUDY METHODOLOGY, FINDINGS AND DISCUSSIONS**

### **Chapter 5 Conceptual Framework and Research Methodology**

#### ***5.1 Introduction***

The previous chapters suggested that WHP can be an effective tool to address OHS because the program designs are needs based. Moreover, WHP provides an integrative approach to address problems. This research will use the key aspects of the model of WHP to investigate the specific workplace issues related to health improvement and risk reduction in Taiwanese ED workplaces, as well as to provide an integrative strategy for further program development to effectively promote OHS for this group of workers.

This chapter introduces the rationale for the research aims and objectives. In addition, it presents a conceptual framework to illustrate how various determinants of OHS can be addressed through a comprehensive needs assessment. The latter part of this chapter provides an overview of research designs and appropriate methodological approaches for data collection and analysis in responding to the objectives of this research.

#### ***5.2 Rationale of research question***

A variety of occupational hazards threaten the health and safety of HCWs; however, exposure to occupational hazards does not occur uniformly for all HCWs because of complex interacting risk determinants. Although research in the field of OHS in the health care industry has emphasised different interventions to deal with these problems, the lack of an integrative approach has led to workplace risk management remaining unsatisfactory. HCWs working in EDs are a priority group requiring more attention to their OHS due to the nature of their work and unstable working conditions, which are more likely to increase the risk of hazard exposure. Similar to EDs around the world, HCWs in Taiwanese EDs struggle with various threats to their physical and psychological health when providing frontline care; thus, it is essential to improve their OHS.



The model of WHP has been recognised as an effective tool to enhance the efforts of OHS because it prevents work-related accidents and diseases, promotes positive lifestyle behaviours, and facilitates organisational development via multidisciplinary cooperation and an integrative approach to address the needs of workplace health and safety (Chu et al., 2000; Chu & Dwyer, 2002; WHO, 2010b; WHO-WPRO, 1999). From the perspective of a setting-based approach, the role and function of hospitals has become significant in implementing health promotion activities not only for their patients and communities, but also to create a healthy workplace for their employees (WHO-Europe, 2006). Unfortunately, current health promoting programs implemented in Taiwanese hospitals show significant shortcomings in reducing workplace risk and improving working conditions for HCWs (Lee, Chen & Wang, 2012; Lin et al., 2009). This could be attributed to the data from government departments for work-related injuries and illness among HCWs not being distinguished between different groups of workers in human health and social work services. It could also be a result of inadequate research investigating the specific needs for health improvement and risk reduction among HCWs. In this regard, this research applies key aspects of the model of WHP to investigate the specific issues with respect to OHS in Taiwanese ED workplaces. Moreover, this study attempts to provide an integrative strategy for further program development to effectively promote health and reduce risk for this group of workers.

### ***5.3 Conceptual framework of this study***

According to the findings of the literature review presented in previous chapters, the risk determinants of each hazard are multi-causal and interrelated. Although single solutions targeting one risk determinant can help deal with problems of occupational exposure, they do not consider the multiple interrelated determinants simultaneously, and thus may lose effectiveness over time. Hence, an integrative approach to addressing the problems of occupational exposure may be useful.

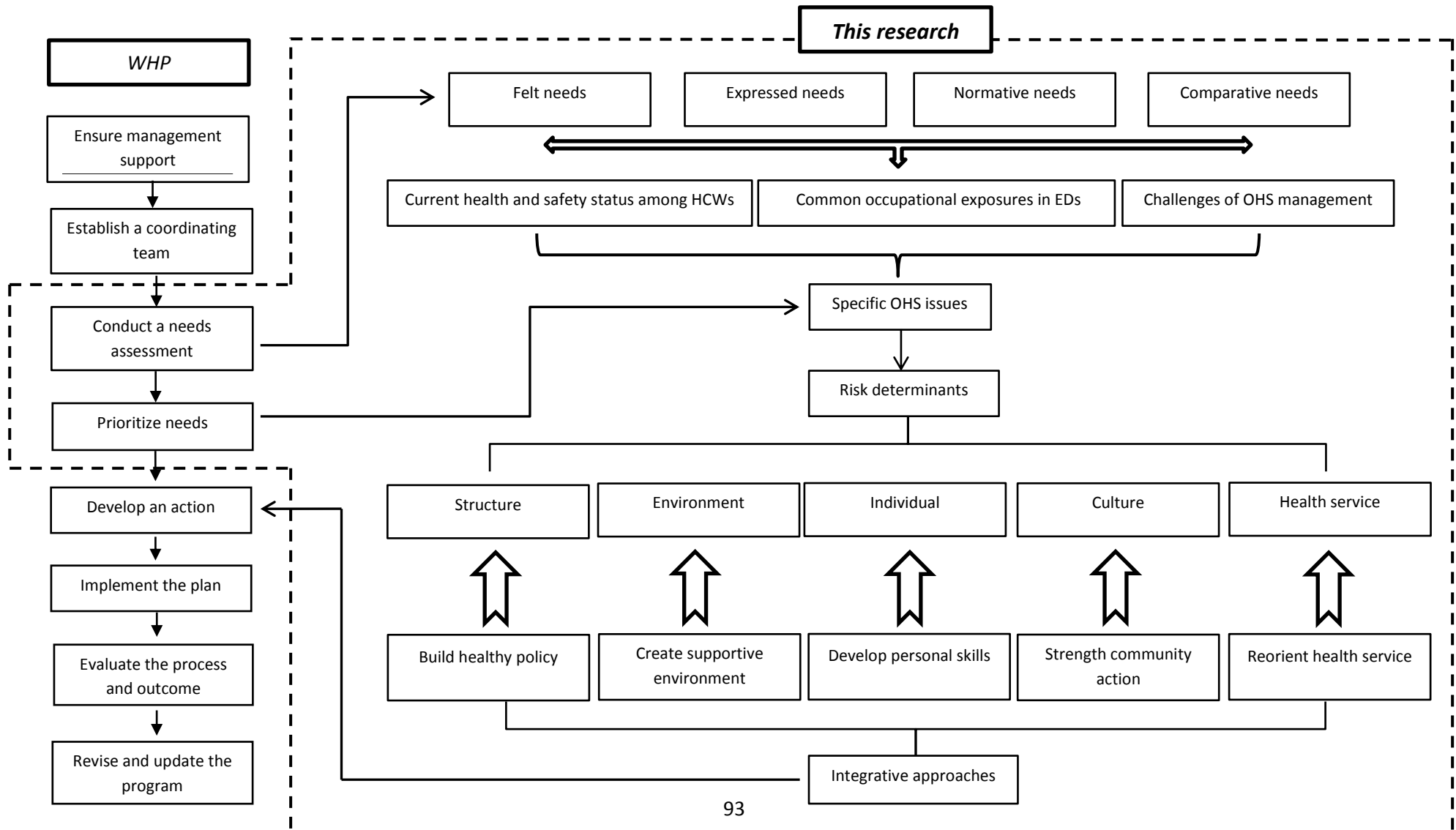
The advantages of WHP are that the program designs are needs based and the strategies to deal with the problems take an integrative approach. The outcomes of WHP not only

increase workers' participation in shaping working conditions, and encourage development of personal skills and lifestyles for health, but also can be undertaken as part of the OHS programs to deal with hazard exposures (Chu & Dwyer, 2002; WHO-WPRO, 1999). Although a variety of hazards affect OHS among HCWs in hospitals, current governmental statistics in Taiwan lack independent data regarding work-related injuries and illnesses for HCWs (Bureau of Labor Insurance, Taiwan, 2012). In addition, research investigating common workplace hazards and barriers of current management regarding OHS has been inadequate. This shortage of basic data increases the difficulty of understanding the specific needs in health and working conditions, particularly for HCWs in Taiwanese EDs.

According to the guidelines provide by WHO-WPRO (1999), the planning and implementation cycle of WHP is composed of an eight-step process. Due to a restricted timeframe and limited organisational and resource support, this study only focuses on the crucial phase in the model of WHP—workplace needs assessment—in order to understand comprehensively the profile of OHS status, common hazard exposures and barriers to OHS management. The results of a workplace needs assessment facilitate both identification of the specific workplace issues related to health and safety, and evidence-based investigation of the risk determinants and their causations, which are crucial elements for developing further solutions.

This study also provides strategy recommendations in accordance with an integrative approach, including policy/standards making, personal skills improvement, creation of a supportive environment, community participation and reorienting of health services, as suggested in the Ottawa Charter for health promotion (WHO, 2010a). These recommendations should help address the multiple interacting risk determinants of workplace issues, and thus assist hospital managers, policymakers and experts to develop and implement future programs for effective health improvement and risk reduction in Taiwanese ED workplaces (see Figure 5.1).

Figure 5. 1 Conceptual framework of this study



#### ***5.4 Research aim and objectives***

The aim of this research is to investigate the workplace health and safety needs and possible solutions for HCWs in the EDs of Taiwanese hospitals to enable effective improvement of OHS among emergency workers. The specific objectives to achieve the aim of the study are to:

1. examine the profile of OHS status among HCWs in EDs and the relevant workplace risk factors
2. investigate the common concerns of key stakeholders regarding occupational hazards in ED workplaces
3. identify the challenges of implementing workplace health and safety programs in hospitals
4. explore the applicability of an integrative WHP model to identify and analyse workplace health and safety needs in EDs, and provide possible solutions
5. make recommendations for future directions for the improvement of workplace health and safety for HCWs in Taiwanese EDs

#### ***5.5 Research designs, data collections and analysis***

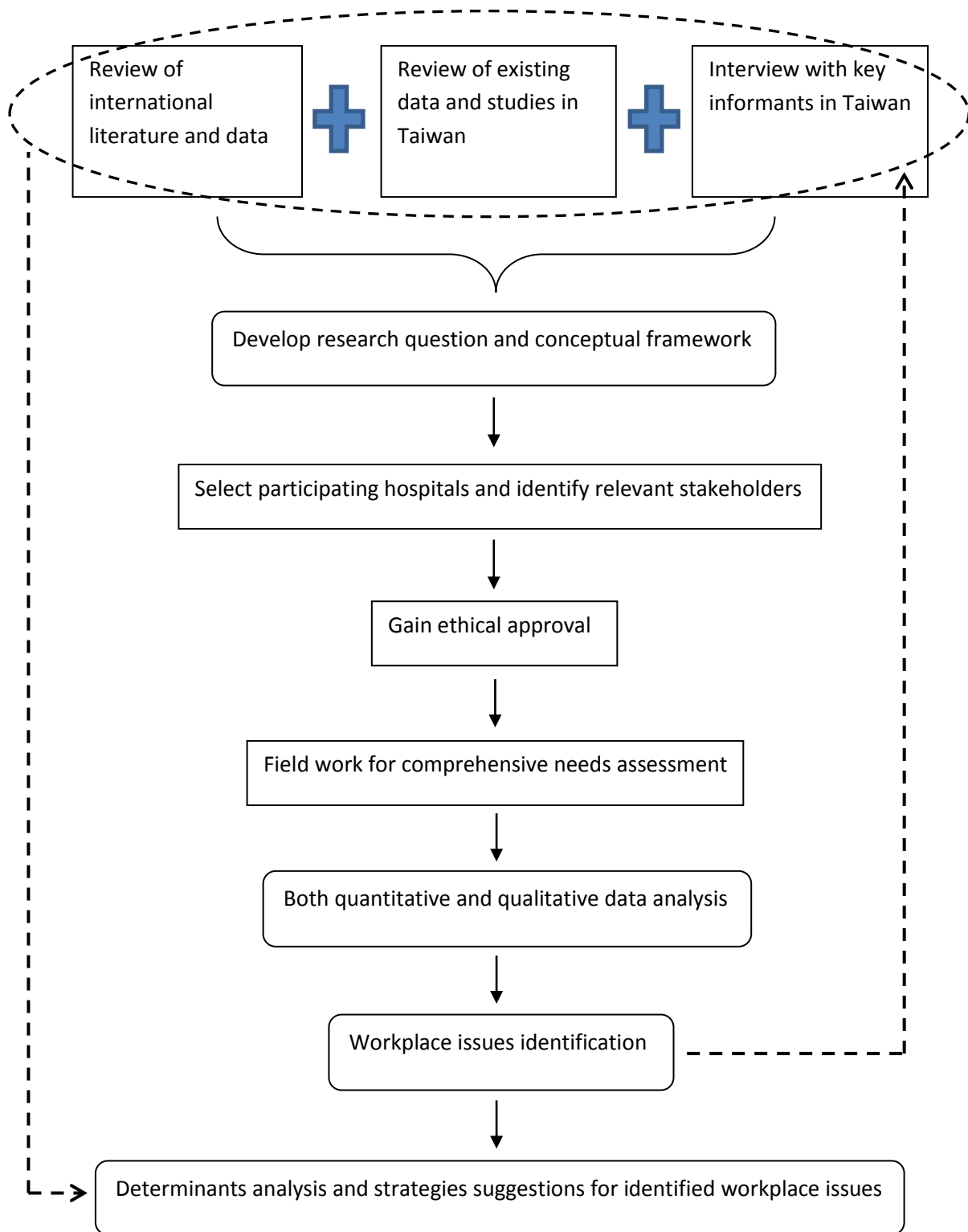
##### **5.5.1 Research designs**

This is a cross-sectional study that was first developed through reviewing the existing data and studies. Following this, a preliminary study was conducted to understand the current problems of OHS among emergency workers in Taiwan, as well as to enquire about the level of interest among hospital executives in supporting the study. This study then identified the relevant stakeholders affected by the issue, or parties interested in workplace health and safety in Taiwanese EDs, to facilitate a further questionnaire survey, group discussions and in-depth interviews.

During the fieldwork, this study applied quantitative and qualitative methods to collect different sources of data. After analysing and integrating both the quantitative and qualitative data, the specific workplace issues related to health and safety among

emergency HCWs in EDs were identified and reported to the participating hospitals. The major findings of this study were compared with pre-existing studies to draw inferences and conclusions. Finally, further feasible and integrative approaches to address the identified workplace issues were recommended. Figure 5.2 illustrates the overall research design of this study.

Figure 5. 2 Overall research design of the study



### **5.5.2 Setting and sampling**

Hospitals in Taiwan are generally classified as medical centres (institutions with the highest level of health care), regional hospitals or district hospitals (the lowest level), based on their facilities, number of beds and responsibility for providing health care. Hospitals that were accredited as district level hospitals were excluded from this study because, in Taiwan, these hospitals are not required to have an ED. Those that do have an ED may have incomplete operations, staffing levels and health care services, which would influence the results of the study. Based on the hospital executives' interests, restricted funding and research timeframe, nine hospitals in medical centres or regional hospitals (each with more than 500 inpatient beds) were randomly selected—three each in northern, central and southern Taiwan.

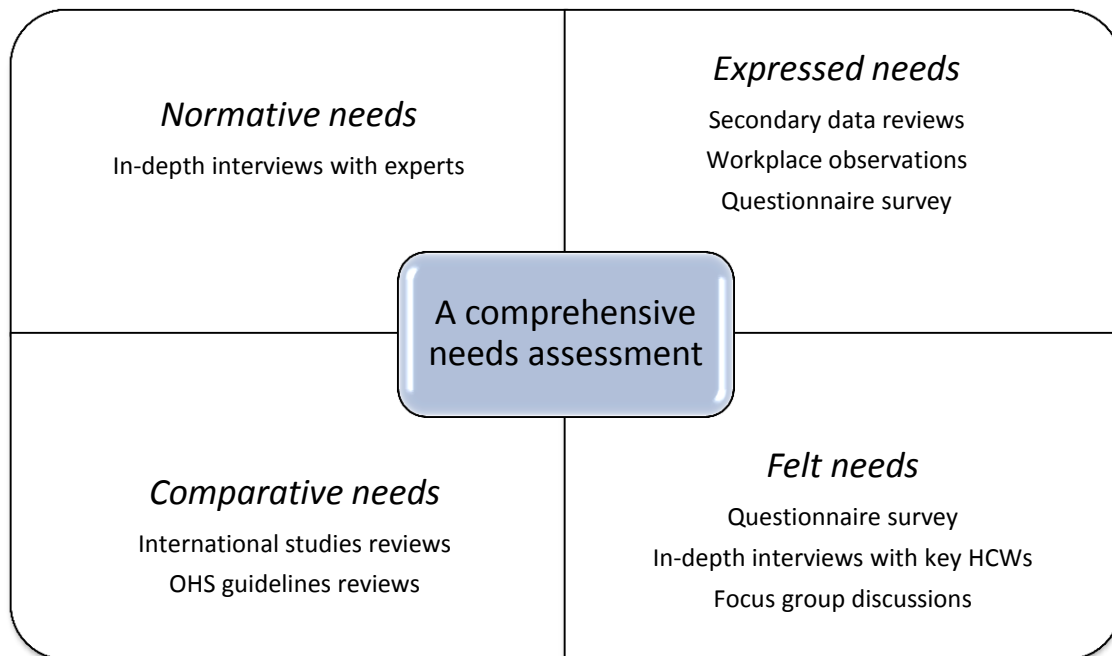
The participants in this study were the relevant stakeholders in Taiwanese EDs. To participate in the study, HCWs had to have completed their probation period, be employed as fulltime workers, and be qualified as health professionals—including physicians, nurses, pharmacists, technicians or other professional support personnel—at the selected hospitals. This was because they may perceive more problems about an ED workplace than administrators or other people who were unfamiliar with the work condition in the ED. Although there were 428 HCWs working in selected EDs, 403 eligible HCWs were recruited for the questionnaire survey and focus group discussions. In addition to HCWs in EDs, other stakeholders in this study were those affected by the issue or interested parties associated with workplace health and safety in Taiwanese EDs, including the hospital executive, occupational disease physician, director of the Emergency Medicine Society, chief of the OHS department, and health promotion practitioners in hospitals. A total of 13 key people in EDs and experts were contacted for in-depth interviews to provide more information.

### **5.5.3 Quantitative and qualitative methods for data collection**

To gain a comprehensive picture of workplace health and safety in Taiwanese EDs, this study collected relevant data regarding current OHS status among HCWs, concerns about

occupational hazards, and the effectiveness of OHS management through different methods in order to meet the different types of needs. In accordance with a taxonomy of needs assessment developed by Bradshaw (1972, cited in Robinson & Elkan 1996, pp. 20–21), four types of different needs—normative, felt, expressed and comparative—were investigated. Figure 5.3 illustrates the techniques of data collection for the different types of needs assessment in this study.

**Figure 5. 3 Techniques of data collection for the different types of needs assessment**



a) Expressed Needs:

In this context, expressed needs are identified by examining the data of work-related injuries and diseases and the potential workplace risks among emergency workers. The research methods used in this included secondary data reviews and workplace observations. In addition, as mentioned in the previous chapter, because the statistics of OHS among emergency workers in Taiwan are lacking, a questionnaire survey was used to help build the profile of OHS status for this group of workers.

b) Felt Needs:

Felt needs are those subjectively defined by the emergency workers themselves. A self-



administered questionnaire, focus group discussions and in-depth interviews with key HCWs (head nurses and chiefs in EDs) were used to determine the staff's experience and perceptions regarding workplace health and safety.

c) Normative Needs:

Normative needs are those defined by experts. Consulting experts is a measure to understand the problems of occupational health and workplace hazards in EDs. These needs seem to be more objective because they are defined by professionals who are involved in workplace health and safety in hospital settings.

d) Comparative Needs:

Comparative needs are those identified by examining the similarities and differences between groups or workplaces. Since there is no previous study exploring the workplace needs among HCWs in Taiwanese hospitals, it is useful to identify or predict needs through reviewing international case studies or OHS guidelines.

As explained above, different techniques of data collection are used for different types of needs assessment. In this study, the qualitative research methods included in-depth interviews, focus group discussions, secondary data reviews and workplace observations. In addition, a questionnaire survey was used for the quantitative research method.

#### *5.5.3.1 Qualitative research methods*

According to Whitley and Crawford (2005), qualitative research aims to understand subjective meanings, experiences, beliefs and attitudes from the respondent's point of view, rather than the researcher's. To gain insights into the workplace problems and concerns about occupational health in Taiwanese EDs, this study used qualitative approaches to enrich understanding of the issue from different sources. The major methods of qualitative data collection used in this study were in-depth interviews, focus group discussions, workplace observation and secondary data reviews. The qualitative research was conducted from April to July 2012 to collect the relevant data.

i. In-depth interviews

In this study, a semi-structured interview was conducted with experts and key HCWs to obtain relevant information about workplace health and safety in EDs. Based on the available time and interest in participating of experts and key people in EDs, this study interviewed a hospital executive, an occupational disease physician, the director of the Emergency Medicine Society, two chiefs of OHS departments and two chiefs of health promotion departments in hospitals (see Table 5.1). The major questions for the in-depth interviews included:

1. What are the common occupational injuries and diseases in EDs? What are their risk determinants?
2. What is included in current workplace interventions to minimise the risk of exposure and promote the health of HCWs in EDs? What are the outcomes of such interventions?
3. What are the significant challenges to addressing OHS for HCWs in EDs?

**Table 5. 1 Participants for in-depth interviews (experts and key HCWs)**

Position title	Participants
Chief of OHS department in hospital	2
Chief of health promotion department in hospital	2
Hospital executive	1
Occupational disease physician	1
Director of the Emergency Medicine Society	1
Head nurse in ED	3
Chief of ED	3

Experts and key HCWs were encouraged to provide more information related to the topic. The sequencing of questions depended on the responses of each expert and key HCW. Generally, each interview lasted at least one hour. The researcher endeavoured to clarify

any ambiguities during the interview process, rather than make judgements on the respondents' answers, in order to reduce the potential bias effects.

ii. Focus groups

To investigate the concerns of workplace health and safety in EDs, one focus group was established for each selected ED. Each group contained six to 10 HCWs who either were volunteers or randomly selected to join the discussions (see Table 5.2). A total of 78 eligible HCWs participated in the focus group discussions. The group discussions ran for a maximum of one hour, with the major questions for the discussions including:

1. What are your concerns about OHS in your workplace? Why?
2. How do you think about current workplace interventions for risk prevention and health promotion in your workplace? What are the advantages or disadvantages of such interventions?
3. What else can be done to improve workplace health and safety?

**Table 5. 2 Numbers of focus groups and HCWs (N = 78)**

Areas	Numbers of group	Numbers of HCWs
Northern	3	25
Central	3	30
Southern	3	23

iii. Workplace observations

Although interviews are a more popular technique in qualitative research, observation provides access not only to a natural workplace situation, but also to ways in which people act and interact (Holloway & Wheeler, 2010, p. 107). In this study, the researcher informed the leaders of EDs when she would arrive to ask questions, but was only marginally involved in the situation and not directly working as a member of the workforce (Holloway & Wheeler, 2010, p. 112). Generally, three to four hours were taken to explore and understand the physical environment and working conditions in each ED. A checklist of workplace observations in this study was referred to the protocols of

general workplace health and safety provided by sample hospitals (Appendix A). To ensure a better understanding of the working conditions and potential risks, workplace observations also included the researcher's perceptions. The data obtained from this technique were used to analyse the determinants and development of strategies. The observation points focused on several elements of the workplace: housekeeping, equipment/device provision and use, space design, security programs and HCWs' interactions with patients or colleagues.

#### iv. Secondary data review

As part of the secondary data review, the researcher reviewed current statistics of work-related injuries and illnesses within the last five years released by the Taiwan Bureau of Labor Insurance, as well as the relevant publications of the IOSH. Although the relevant health and safety records (absenteeism rate, staff turnover, accident and disease records, workers compensation data and results of medical surveillance) can be used to provide evidence for the analysis of health status among emergency HCWs, the majority of participating hospitals were reluctant to provide these records to the researcher due to the confidential consideration. Hence, apart from the government statistics, the researcher predicted the workplace needs in Taiwanese EDs by examining international studies and relevant standards or policies about occupational hazards management. This strategy is also valuable for recommendations for developing further feasible and sustainable strategies to promote healthy ED workplaces.

#### 5.5.3.2 *Quantitative research methods*

In this study, a questionnaire survey was used to collect data on the OHS status of HCWs in EDs and to investigate the risk factors. It consisted of seven parts: (i) demographic data; (ii) health status; (iii) plans of health improvement; (iv) each individual's feelings about his or her health and job; (v) worry, nerves and stress; (vi) workplace health and safety and (vii) health interests. The researcher used the quantitative results to enhance the qualitative description and interpretation in order to present a complete picture of the needs and issues in ED workplaces. The questionnaire survey was conducted from April to July 2012. Based on the conditions established for the participating HCWs, a total of

403 questionnaires were delivered to the eligible HCWs by a leader in each ED. The HCWs were requested to return the completed questionnaires in sealed envelopes to a collecting box placed at their workplaces. Ultimately, 326 (80.9%) questionnaires were returned.

#### **5.5.4 Data analysis**

The data analysis in this study examined and compared the empirical evidence from different research methods, and reached a conclusion to achieve the overall research aim. The following section explains the appropriate techniques selected to analyse the qualitative and quantitative data.

##### *5.5.4.1 Qualitative data analysis*

Thematic analysis was undertaken for the data analysis of all transcriptions of interviews and focus group discussions. In the process of data analysis, the researcher coded each idea that occurred in the data, and grouped the codes with similar meanings into different categories. The researcher then sought linkages and relationships between different categories, and extracted both explicit and implicit themes from these. In addition, the findings of current OHS statistics, workplace observations and international studies were presented by narrative summaries.

##### *5.5.4.2 Quantitative data analysis*

This study applied non-parametric data analysis. SPSS 20 version was used to analyse the data. Descriptive analysis explored the frequency distribution of categorical variables, while the Chi-square test examined the relationship between self-reported work-related injuries/diseases and different categorical variables. To predict the risk times of personal and workplace factors on work-related injuries and diseases among HCWs, the model of logistic regression was used.

### **5.5.5 Issues of validity and reliability**

#### *5.5.5.1 Quantitative Research*

The questionnaire in this study was modified from the sample questionnaire provided by the WHO-WPRO (1999) *Regional Guidelines for the Development of Healthy Workplaces* in order to investigate the specific health and safety issues in ED workplaces. It was consulted by four experts in the fields of nursing, emergency medicine, OHS and HPH to ensure the applicability of the questionnaire and that no ambiguous sentences or inappropriate words appeared in the questionnaire. Following this, the content of the questionnaire was translated into Chinese to facilitate responses and decrease the possibility of misunderstanding by the participants. The questionnaire was piloted on 10 HCWs in EDs to ensure the research instrument was repeatable in the target populations, prior to delivery to the selected EDs.

#### *5.5.5.2 Qualitative Research*

To address validity in the qualitative research, the descriptions and interpretations of individual experience and perception were completely recorded. All in-depth interviews and focus group discussions were conducted and analysed by the same researcher. The results were reviewed and discussed with the researcher's supervisors to ensure that the appropriate themes were created without bias. Although it is difficult to ensure reliability in qualitative research, multiple methods—including interviews, focus group discussions, workplace observations and secondary data reviews—were used to take advantage of the complementary strengths and minimise the weaknesses of each method to ensure the data were reliable in the qualitative research.

### **5.6 Ethical issues**

As humans were the samples in this research, the researcher adopted a serious attitude to her responsibility regarding integrity in the production of knowledge by protecting the respondents' mental, emotional and physical welfare in an appropriate manner (O'Leary, 2004, p. 93). First, ethical approvals from the Griffith University Human Research Ethics Committee and Institutional Review Board in Taiwan Kuang-Tien General Hospital were

obtained prior to conducting the research (the Institutional Review Board is a committee designed to review research proposals). Second, an informed consent form containing relevant information about the research was given to the participants. This clearly stated the right to withdraw from the study process at any time if any feeling of discomfort or personal conflict of interest occurred. Information about where to access the research results, once the study is completed, was also clearly indicated on the consent form.

Third, to protect the privacy and anonymity of the respondents, no participant was identified from the responses of the questionnaire survey or the focus group discussions. Finally, all information obtained from the respondents was kept confidential and used only for research purposes. Hence, only the interview number and conversation text are presented in the interview transcriptions. Each respondent's participatory status, full name and hospital of employment were kept as separate data. This information was used only for further contact to clarify any ambiguous meaning arising from the interviews, or if some responses were omitted from the survey. This information will be destroyed once the report is completed. Except for the research team, no third party, including hospital executives or managers in EDs, can access the details of the participants.

## ***5.7 Conclusion***

This chapter has explained the background and rationale that underpins this research. It has described in detail the variety of methodological strategies in terms of research design, data collection and data analysis that guided the process of this research. The types of needs assessment and techniques to address the research questions are presented in Table 5.3. The next chapter will present the results of the comprehensive workplace needs assessment based on the quantitative and qualitative analysis of data from these various sources.

**Table 5. 3 Research matrix**

**Research Aim:** *Investigate the workplace health and safety needs and potential solutions for health care workers in the emergency departments of Taiwanese hospitals.*

Objectives	Types of needs assessment	Data collections	Data analysis	Validity and Reliability	Ethics
1) To explore the profile of OHS status among HCWs in EDs and the relevant workplace risk factors.	Felt needs Expressed needs	<b>1.1) <u>Quantitative method</u></b>  Questionnaire survey  <b>1.2) <u>Qualitative method</u></b>  Secondary data review  Workplaces observation	<b>1.1)</b> Frequency distribution and Chi-square and logistic regression tests  <b>1.2.1)</b> Thematic analysis	* The questionnaire was modified from the sample provided by WHO-WPRO (1999) and approved by experts' reviews.  * The questionnaire had a pilot-test prior to conducting the survey.	* Ethical approvals  * Informed consent  * Confidential considerations
2) To investigate common concerns of key stakeholders about occupational hazards in ED workplaces.	Felt needs Normative needs Comparative needs	<b>2.1) <u>Quantitative method</u></b>  Questionnaire survey  <b>2.2) <u>Qualitative method</u></b>  Focus group discussion  In-depth interviews  Secondary data review	<b>2.1.1)</b> Frequency distribution and Chi-square tests  <b>2.2.1)</b> Thematic analysis	* Applied multiple methods to complementary strengths and minimize the weaknesses of each methods to address reliable and sustainable data.	



Objectives	Types of needs assessment	Data collections	Data analysis	Validity and Reliability	Ethics
3) To identify the challenges of implementing workplace health and safety programs in hospitals.	Felt needs Normative needs	<b>3.1) <u>Quantitative method</u></b>  Questionnaire survey  <b>3.2) <u>Qualitative method</u></b>  In-depth interviews  Focus group discussions	<b>3.1.1)</b> Frequency distribution  <b>3.2.1)</b> Thematic analysis	* Completely presented the descriptions and discussed themes with supervisors.	
4) To explore the applicability of integrative WHP model to identify and analyse the workplace health and safety needs in EDs, and to provide the possible solutions.					
5) To make recommendations for future directions for the improvement of workplace health and safety for HCWs in Taiwanese EDs.					

## **Chapter 6 Profile of OHS Status among ED HCWs and Relevant Workplace Risk Factors**

### ***6.1 Introduction***

Information about the OHS status of HCWs in EDs is an important reference point in examining the needs of workplace health and safety in EDs. For a comprehensive understanding of the profile of OHS status, expressed and felt needs were investigated. This chapter includes four parts. First, this chapter reviews the government statistics to determine the common types of occupational injury and disease among health care participants. Second, it presents the self-reported data gathered from the questionnaire survey about the health and safety issues among emergency HCWs, including (i) demographic data, (ii) health status, (iii) feelings about health and the job, (iv) plans for health improvement and (v) prevalence of work-related injuries and diseases. Third, the potential risk factors in the workplace that caused the experiences and concerns of occupational exposure among HCWs in EDs are examined. Finally, workplace observation provides a picture of the physical and organisational environment in EDs that may threaten the health and safety of HCWs.

### ***6.2 Reviewing government statistics of occupational injury and illness among health care participants***

The statistics released from the Taiwan Bureau of Labor Insurance (2012) are the sole data available to understand the profile of occupational injury and illness among different classified workers. However, government statistics about work-related injuries and illness among HCWs are not separated from all other workers in human health and social work services, which increase the difficulty in examining current OHS status among HCWs in EDs. Nevertheless, some information can be gleaned. As discussed in Chapter 3, the prevalence of occupational incidents in the group of human health and social work services rose between 2005 and 2011. Moreover, concerning the types of occupational injury and disease among the workers of human health and social work services in Taiwan, traffic accidents during commute<sup>1</sup> cause the greatest proportion of occupational injuries (n = 3,520; 73%). Despite this, other common work-related injuries include falls (n = 475; 9.9%), dropping things (n = 154; 3.2%) and improper action (n = 143; 3%) (Bureau of Labor Insurance, Taiwan, 2012) (see Table 6.1). In contrast, the prevalence of occupational diseases among this group of

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<sup>1</sup> Traffic accidents during commute are not considered work-related injuries for this study.

workers is much lower. Table 6.2 shows that more workers suffered from musculoskeletal disorders (n = 49; 39%) than biological hazards (n = 44; 35%) in their work (Bureau of Labor Insurance, Taiwan, 2012). However, the interpretation of these data for occupational injuries and diseases among HCWs is limited.

**Table 6. 1 Frequency of occupational injuries among workers of human health and social work services, by cause (2007-2011)**

Cause	2007	2008	2009	2010	2011	Total
<b><i>Dropping things</i></b>	<b>23</b>	<b>30</b>	<b>45</b>	<b>34</b>	<b>22</b>	<b>154</b>
<b><i>Falls</i></b>	<b>100</b>	<b>84</b>	<b>96</b>	<b>78</b>	<b>117</b>	<b>475</b>
Crash / dash	9	10	9	14	25	67
Matter flying down	2	3	7	5	4	21
Cave-in	3	2	1	1	3	10
Rolling up	14	21	21	17	21	94
Cutting	15	21	22	17	24	99
Tread down	0	1	0	1	2	4
Drown	0	0	0	0	0	0
Hot or low temperature	12	9	7	17	22	67
Contact with hazard	1	4	1	3	2	11
Electrical accident	1	2	1	2	1	7
Explosion	0	0	0	1	0	1
Matter breaking	1	0	0	0	3	4
Fire	0	0	1	2	0	3
<b><i>Improper action</i></b>	<b>13</b>	<b>38</b>	<b>26</b>	<b>34</b>	<b>32</b>	<b>143</b>
<b><i>Traffic accident on the commute<sup>#</sup></i></b>	<b>555</b>	<b>602</b>	<b>650</b>	<b>836</b>	<b>877</b>	<b>3520</b>
Others	27	29	25	27	32	140
Total <sup>*</sup>	776	856	912	1089	1187	4820

<sup>#</sup> In Taiwan, traffic accident on the commute is included in occupational injury.

<sup>\*</sup> The cases include injury / sickness, permanent disability and death.

Source: Annual report 2012 (Bureau of Labor Insurance, Taiwan, 2012)

**Table 6. 2 Frequency of occupational diseases among workers of human health and social work services, by cause (2007-2011)**

Cause	2007	2008	2009	2010	2011	Total
Eye diseases	0	0	0	0	0	0
Ionizing radiation	0	0	0	0	0	0
Extreme air-pressure	0	0	0	0	0	0
Extreme temperature	0	0	0	0	0	0
Hearing loss caused by noise	0	0	0	0	0	0
<b>Musculoskeletal disorders®</b>	<b>1</b>	<b>5</b>	<b>10</b>	<b>20</b>	<b>13</b>	<b>49</b>
Diseases caused by vibration	0	0	0	0	0	0
Hypoxia	0	0	0	0	0	0
Lead and its compounds	0	0	0	0	0	0
Other heavy metal and its compounds	0	0	0	0	0	0
Organic solvents or chemical air	0	0	0	0	0	0
<b>Biological hazards</b>	<b>6</b>	<b>4</b>	<b>7</b>	<b>18</b>	<b>9</b>	<b>44</b>
Occupational asthma, allergic pneumonia	3	2	1	0	0	6
Coal workers pneumoconiosis and its complications	0	0	0	0	2	2
Silicosis and its complications	0	0	0	0	0	0
Pulmonary asbestosis and its complications	0	0	0	0	0	0
Skin diseases related to occupation	1	1	2	2	0	6
Cancers related to occupation	0	0	0	0	0	0
Brain and cardiovascular diseases	0	1	1	0	2	4
Mental illnesses#	-	-	-	0	0	0
Other	1	3	5	3	2	14
Total*	12	16	26	43	28	125

® Musculoskeletal disorders included occupational low back pain, arms, neck and shoulders diseases.

# "Mental illnesses" are included in the causes of occupational illness since 2010.

\* The cases include injury / sickness, permanent disability and death.

Source: Annual report 2012 (Bureau of Labor Insurance, Taiwan, 2012)

### **6.3 Self-reported occupational health status among HCWs in EDs**

This study used a questionnaire survey to collect data of self-reported health and safety problems and potential risk factors among emergency HCWs. The survey involved three northern hospitals, three central region hospitals and three southern hospitals in Taiwan. A total of 403 eligible HCWs working in the EDs of the selected hospitals were approached. There were 326 responses, with an overall return rate of 80.9%. This section presents the data

related to (i) characteristics of the survey respondents, (ii) health status, (iii) feelings about their health and job, (iv) plans for health improvement and (v) prevalence of work-related injuries and illnesses.

### **6.3.1 Characteristics of the survey respondents**

Table 6.3 presents the characteristics of the survey respondents. The majority of respondents were registered nurses ( $n = 213$ ; 65.3%), while the others were physicians ( $n = 89$ ; 27.3%) and other health professionals ( $n = 23$ ; 7.0%). Females comprised 67.5% of respondents, and participating HCWs with a university achievement (77%) predominated in the survey. Regarding marital status, there were slightly more married respondents (51.8%) than single respondents (46.9%). The average age was 32.78. The mean body mass index (BMI) was  $22.39 \text{ kg/m}^2$ , which was in the population's normal range (18.5~24.9) (WHO, n.d.a). However, around one fifth of participants ( $n = 71$ ; 21.8%) could be identified as overweight because their BMI was higher than  $24.9 \text{ kg/m}^2$ . The average length of service in the EDs where they were practising was 5.36 years.

**Table 6. 3 Characteristics of the survey respondents (N = 326)**

<b>Variable</b>	<b>n</b>	<b>%</b>	<b>Mean</b>	<b>(SD)</b>
<b>Occupations</b>				
Physician	89	27.3		
Registered nurse	213	65.3		
Others <sup>a</sup>	23	7.0		
Not indicated	1	0.3		
<b>Gender</b>				
Male	105	32.2		
Female	220	67.5		
Not indicated	1	0.3		
<b>Marital status</b>				
Single	153	46.9		
Married	169	51.8		
Separated / Divorced	4	1.2		
<b>Age (Y/O)</b>				
Range = 21- 62			32.78	8.067
Not indicated	1	0.3		
<b>Educational level</b>				
Senior high school	3	0.9		
Diploma	47	14.4		
University	251	77.0		
Postgraduate	25	7.7		
<b>Current weight (kg)</b>				
Range = 40 - 118			60.46	13.228
Not indicated	5	1.5		
<b>Current height (cm)</b>				
Range = 146 – 187			163.67	7.823
Not indicated	5	1.5		
<b>BMI (kg/m<sup>2</sup>)</b>				
Range = 15.63 – 40.35			22.39	3.549
Not valid	5	1.5		
<b>Job duration (months)</b>				
Range = 3 - 300			64.33	57.117
Not indicated	5	1.5		

a: including pharmacists, radiologists or other technicians who are responsible to EDs, and other supportive or training HCWs in EDs

### **6.3.2 Health status**

This section, as summarised in Table 6.4, includes both the self-reported physical health problems and health-related behaviour of participating HCWs in EDs during the year prior to the survey being conducted. Regarding physical health, the participating HCWs were generally in good health, since the majority of respondents had neither been treated by doctors, nor taken leave for sickness or injury, in the year before the study was conducted. Those who were absent from work were likely to have taken less than three days. In addition, respondents who reported a physical health problem that had been treated by doctors during the year before the study were more likely to have experienced respiratory tract infections (30.5%), gastritis (7.6%) or urinary system diseases (6.7%), which tended to be acute health problems. Conversely, the respondents' family members who had health problems were more likely to have suffered from chronic diseases, including diabetes, cancers and heart diseases - 41.5, 24.0 and 20.2%, respectively. Regarding risky health behaviour among the participating HCWs, fewer than 10% were smokers ( $n = 23$ ; 7%), while 12% drank beer and 7% drank wine (see Table 6.4).

**Table 6. 4 Frequency distribution of self-reported health status among respondents during the year prior to the survey being conducted (N = 326)**

Variables	n	%
<b>Sick leaves</b>		
0 day	239	73.3
1-3 days	50	15.3
>3 days	34	10.4
Missing	3	0.9
<b>Injury leaves</b>		
0 day	306	93.9
1-3 days	12	3.7
>3 days	5	1.5
Missing	3	0.9
<b>The most common health problems of individual staff</b>		
None	219	67.6
Respiratory tract infection <sup>a</sup>	32	30.5
Gastritis	8	7.6
Urinary system diseases <sup>b</sup>	7	6.7
Missing	2	0.6
<b>The most common health problems of family members</b>		
None	142	43.7
Diabetes	76	41.5
Cancer	44	24.0
Heart diseases	37	20.2
Missing	1	0.3
<b>Smoke</b>		
Yes	23	7
No	300	92
Missing	3	0.9
<b>Meals including fresh fruit and vegetable</b>		
3 meals of the day	34	10.4
2 meals of the day	125	38.3
1 meal of the day	164	50.3
Missing	3	0.9
<b>Alcohol consumption</b>		
<b>Beer</b>		
None	281	86.2
1-3 bottles	33	10.1
>3 bottles	7	2.1
Missing	5	1.5
<b>Wine</b>		
None	299	91.7
1-3 glasses	18	5.5
>3 glasses	5	1.5
Missing	4	1.2

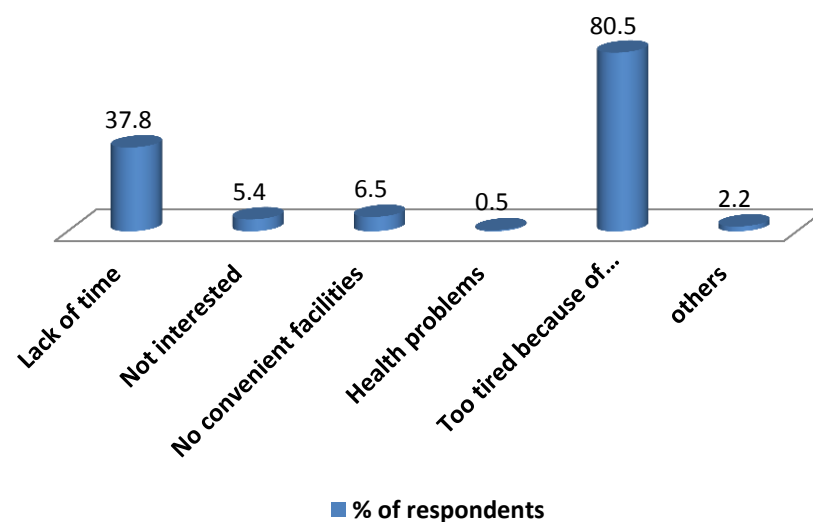
a: Respiratory tract infection including bronchitis and flu.

b: Urinary system diseases including acute pyelonephritis and urinary tract infection.



All participating hospitals in this study were engaged in the Taiwanese HPH network; thus, programs to encourage staff to engage in appropriate exercise and fitness had generally been implemented in their workplaces. The reasons most commonly reported to inhibit exercising reported by the participating HCWs were ‘too tired because of work’ (n = 149; 80.5%) and ‘lack of time’ (n = 70; 37.8%) (see Figure 6.1). However, if the workplace was to provide exercise equipment for its employees, around two thirds of the total respondents (n = 214; 65.6%) expressed the intention to exercise. This result seems incompatible with the data of the previous question, given that, even if exercise equipment was provided in workplaces, the intention of exercising among HCWs may be affected by being ‘too tired’ and having ‘lack of time’.

**Figure 6. 1 Reasons inhibiting exercise (N = 185)**



### 6.3.3 Feelings about health and the job

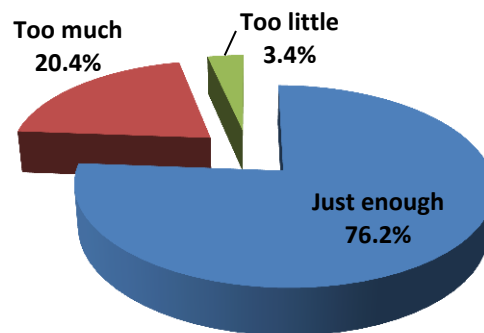
A series of questions investigated the ED HCWs’ feelings about their health and the job, using a five-point Likert scale. In general, responses to ‘strongly agree’ and ‘agree’ were much more frequent than ‘disagree’ and ‘strongly disagree’ in all statements on the questionnaire (see Table 6.5). However, the statement, ‘I think that, if I wanted to, I could quite easily find another job at least as satisfying as this one’, had more answers to ‘strongly agree’ than the others. This may reflect the fact that staff shortage in Taiwanese health care institutions is common, and job change was not a difficult thing for participating HCWs. Conversely, a response of ‘strongly disagree’ was more common to the statement, ‘my employer makes every effort to keep unnecessary stress at work to a minimum’. These data

indicate the need to improve current organisational interventions to reduce job stress for emergency HCWs. In addition, the majority of participating HCWs were confident of their professional ability to cope with job challenges, given that the proportion of participating HCWs who perceived job challenge as ‘just enough’ was nearly four times the proportion who perceived it as ‘too much’. Only 3.4% indicated that the job challenge was too little (see Figure 6.2).

**Table 6. 5 Frequency distribution of feelings about health and the job (N = 325)**

Items	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)
I am in control of my own health.	3.1	50.8	39.1	6.8	0.3
I have an influence over the things that happen to me at work.	3.4	60.6	30.5	4.9	0.6
My employer knows that stress at work can have bad effects on employees' health.	11.4	53.2	24.3	8.9	2.2
<b><i>My employer makes every effort to keep unnecessary stress at work to a minimum.</i></b>	2.8	33.5	37.8	18.2	<b>7.7</b>
I am satisfied with the recognition I receive from my employer for doing a good job.	1.8	33.2	41.5	16.6	6.8
I am satisfied with the amount of involvement I have in decisions that affect my work.	1.8	43.7	38.8	14.2	1.5
My employer has a sincere interest in the wellbeing of its employees.	2.8	36.6	39.4	15.4	5.8
I am satisfied with the fairness and respect I receive on the job.	2.8	40.6	32.3	19.4	4.9
I feel I am well rewarded for the level of effort I put in for my job.	1.5	32.6	40.3	18.8	6.8
<b><i>I think that, if I wanted to, I could quite easily find another job at least as satisfying as this one.</i></b>	<b>12.9</b>	40.3	39.1	6.8	0.9
If I had to find another job today, I think I would have all the skills and training I would need to do so.	12.3	56.3	27.7	3.7	0
At work, I feel I often have to do things or make decisions that I know are bad for my mental or physical health.	7.7	56.3	27.7	8.3	0
On the whole, I like my job.	3.4	55.7	28.0	10.5	2.5
I look outside of my job for my main satisfaction on life.	9.8	65.8	22.2	2.2	0

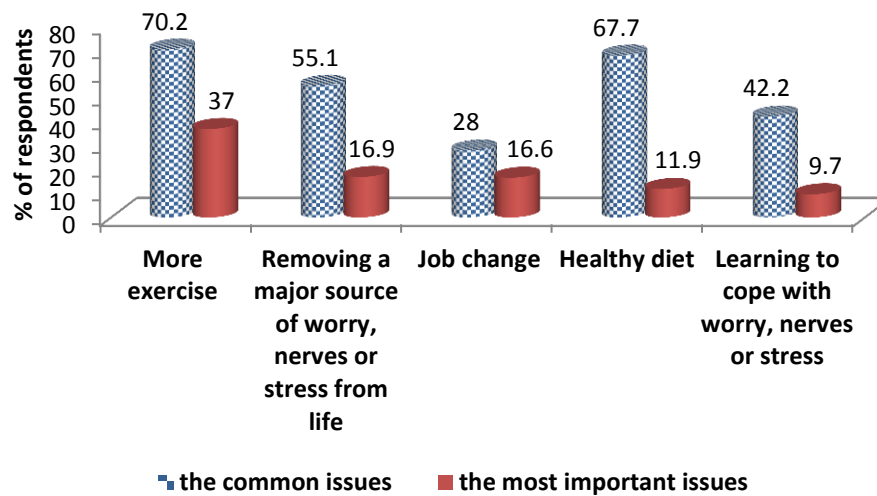
**Figure 6. 2 Levels of perceived job challenge among participants (N = 324)**



#### **6.3.4 Plans for health improvement**

Regarding plans and considerations for improving or maintaining personal health in the year ahead, the majority of participating HCWs planned to do more exercise (n = 228; 70.2%); adopt a healthy diet (n = 220; 67.7%); or remove a major source of worry, nerves or stress from their life (n = 179; 55.1%). However, when asked about the single most important thing that would improve their health, a surprisingly significant item was 'job change' (n = 53; 16.6%); followed by 'more exercise' (n = 118; 37%); and 'removing a major source of worry, nerves or stress from life' (n = 54; 16.9%) (see Figure 6.3). The plan to change jobs to improve or maintain health may correspond with the result presented in the previous section regarding feelings about health and the job. This combination of findings suggests that more attention should be paid to understanding the reasons behind emergency HCWs' intention to change their jobs.

**Figure 6. 3 Frequency distribution of plans to improve or maintain health (N = 325)**

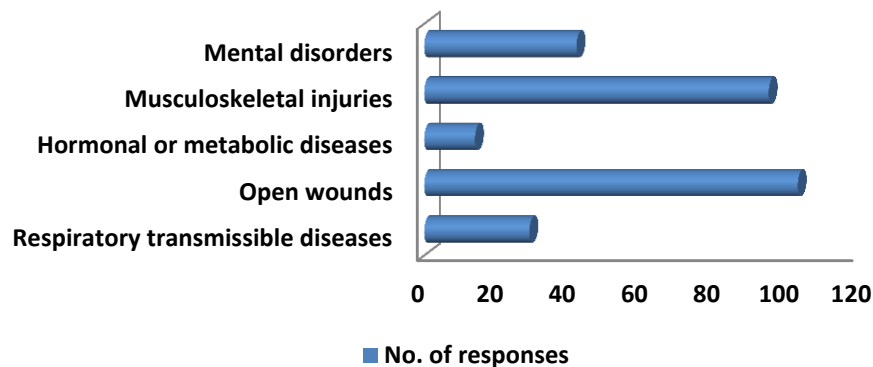


### 6.3.5 Prevalence of work-related injuries and diseases

A total of 173 participating HCWs (53.1%) reported experiences of work-related injury or disease. Among this group, open wounds (such as needlesticks, sharps or cutting wounds) were the most common injury, accounting for two thirds of that group (n = 103; 60%). MSDs were reported by more than half of experienced staff (n = 95; 55%), and ranked as the second most common occupational injury in the selected EDs. About one quarter of experienced staff (n = 42; 24.2%) suffered from work-related mental health-related problems, such as excessive stress, depression and anxiety. Nearly one fifth had experienced transmissible respiratory diseases (n = 29, 16.7%) (see Figure 6.4).

Exposure to musculoskeletal and biological hazards (resulting from needlesticks, cutting wounds or respiratory transmissible diseases) was the most significant occupational exposures among ED HCWs. This result may support the data of the Bureau of Labor Insurance on common reported occupational diseases among workers in the group of human health and social work services (see Table 6.2). Surprisingly, although the participating HCWs were very aware of mental health-related problems as occupational illnesses, no record of reported mental illnesses among the group of human health and social work services has been found in the statistics of the government authority (see Table 6.2). The results presented in this section may indicate that MSDs, biological and psychological hazards are priorities that need to be addressed.

**Figure 6. 4 Frequency distribution of the most common experiences of occupational injuries or diseases among participants**



Some variables can affect work-related injuries or diseases among HCWs in EDs. The results show that there are significant differences in the distributions of marital status ( $\chi^2 = 3.862$ ,  $p < 0.05$ ), job duration ( $\chi^2 = 6.207$ ,  $p < 0.05$ ) and physical health problems ( $\chi^2 = 4.844$ ,  $p < 0.05$ ) between HCWs who reported work-related injuries or diseases and those who did not (see Table 6.6). In addition, HCWs with sick leave and injury leave had a higher percentage of self-reported work-related injuries or diseases, respectively 66.3 and 76.5% ( $p < 0.05$ ) (see Table 6.7). Such high absenteeism resulting from work-related injuries or diseases may suggest that exposure to occupational hazards in ED workplaces is serious to HCWs. This finding may raise issues associated with affecting the health condition of individual workers, as well as financial losses and disrupting the normal operations of EDs.

**Table 6. 6 Work-related injuries or diseases by personal variables**

Variables	Work-related injuries or diseases			x <sup>2</sup>	df	p
	N	No n (%)	Yes n (%)			
<b>Health occupations</b>	301			1.075	1	0.300
Physician		44 (49.4)	45 (50.6)			
Registered nurse		91 (42.9)	121 (57.1)			
<b>Gender</b>	324			1.452	1	0.228
Male		54 (51.4)	51 (48.6)			
female		97 (44.3)	122 (55.7)			
<b>Marital Status</b>	320			3.862	1	<b>0.049*</b>
Single		80 (52.3)	73 (47.7)			
Married		69 (41.3)	98 (58.7)			
<b>Age (Y/O)</b>	311			4.018	2	0.134
20-30		78 (51.7)	73 (48.3)			
31-40		50 (39.7)	76 (60.3)			
41-50		15 (44.1)	19 (55.9)			
<b>Educational Levels</b>	321			0.487	2	0.784
Diploma		22 (47.8)	24 (52.2)			
University		113 (45.2)	137 (54.8)			
Postgraduate		13 (52.0)	12 (48.0)			
<b>BMI</b>	319			0.430	2	0.807
<18.5		21 (51.2)	20 (48.8)			
18.5-24.9		95 (45.7)	113 (54.3)			
>24.9		33 (47.1)	37 (52.9)			
<b>Job duration(months)</b>	319			6.207	1	<b>0.013*</b>
3-60		101 (52.3)	92 (47.7)			
>60		48 (38.1)	78 (61.9)			
<b>Physical health problems</b>	322			4.844	1	<b>0.028*</b>
No		111 (51.2)	106 (48.8)			
Yes		40 (38.1)	65 (61.9)			
<b>Smoke</b>	321			0.188 <sup>a</sup>	1	0.755
No		146 (46.9)	165 (53.1)			
Yes		4 (40.0)	6 (60.0)			
<b>Drinking alcohol</b>	319			0.327	1	0.567
No		128 (47.1)	144 (52.9)			
Yes		20 (42.6)	27 (57.4)			

a: There is more than 20% of total cells having expected count <5. The result is Fisher's Exact Test.

\*:  $p < 0.05$

**Table 6. 7 Relationships between absenteeism and work-related injuries or diseases among HCWs**

Variables	Work-related injuries or diseases			$\chi^2$	df	p
	N	No n (%)	Yes n (%)			
<b><i>Sick leaves</i></b>	321			7.955	1	<b>0.005*</b>
None		123 (51.7)	115 (48.3)			
>1 day		28 (33.7)	55 (66.3)			
<b><i>Injury leaves</i></b>	321			3.983	1	<b>0.046*</b>
None		147 (48.4)	157 (51.6)			
>1 day		4 (23.5)	13 (76.5)			

\*:  $p < 0.05$

#### ***6.4 Workplace risk factors affecting OHS***

Alongside individual health problems and health-related behaviours, OHS status among HCWs in EDs can be attributed to various workplace factors. This study investigated four elements of workplace factors that may cause exposure incidents or concerns among HCWs: physical environment and equipment supply, health service and management, work characteristics, and organisational aspects. The results of the top five concerns about potential factors affecting OHS in each element of the ED workplaces reported by the participating HCWs are displayed in Table 6.8.



**Table 6. 8 Common concerns about workplace factors affecting OHS in EDs (multiple choice)**

Issues	n	%
<b>A. Physical environment and equipment supply</b>		
Too much noise	123	38.0
Inadequate security system and personnel	121	37.3
Lack of private room for staff to take a break	101	31.2
Inadequate working space	96	29.6
Inadequate isolation room to accommodate the patients with special health needs	86	26.5
<b>B. Health service and management</b>		
Inadequate training programs of occupational health and safety to address the needs at work	108	33.3
Lack of routine health surveillance	57	17.6
Lack of updated medical information related to the work	55	17.0
Unclear standards of work procedure and safety regulations in ED	34	10.5
Lack of clear instructions and effective occupational exposure management (prevention, report and follow up)	34	10.5
<b>C. Work characteristics</b>		
Inadequate time to take a break (eating or toilet)	183	56.5
Heavy workloads	162	50.0
Awkward postures / repetitive motions	139	42.9
Shift work	125	38.6
Worry about facing unpredictable disaster or diseases with unknown transmission	111	34.3
<b>D. Organizational aspects</b>		
Managers endeavour to improve quality of care for patients but ignore the rights and welfare among health care workers in ED	196	60.5
Long-term staff shortage or high turnover in ED	192	59.3
Difficulty in process of transferring patients after ED treatment (e.g. admission, transfer to other care units or hospitals)	104	32.1
Hospital does not consider staff opinion and needs in decision-making regarding workplace safety	102	31.5
Workplace health and safety has not been emphasized in ED	94	29.0

Among participating HCWs, too much noise (38.0%), inadequate security personnel and surveillance systems (37.3%), and lack of private space for staff to rest (31.2%) were important issues related to the physical environment and equipment supply. Regarding existing health services and management, one third of respondents (33.3%) perceived that the training programs of OHS were insufficient to address the needs of their work. Inadequate time to take a break (eating or toileting), heavy workloads and awkward postures/repetitive motions appeared as frequent concerns related to work characteristics—56.5, 50.0 and 42.9% of responses, respectively.

For the organisational aspects, considerations of ‘managers endeavour to improve quality of care for patients, but ignore the rights and welfare among HCWs in ED’ (60.5%) and ‘long-term staff shortage or high turnover in ED’ (59.3%) were important to a large number of respondents. Table 6.7 shows that these were the highest-ranking issues of all the elements. These two issues indicate that organisational aspects pose greater concerns regarding health and safety to HCWs than other elements of workplace factors. Moreover, these two issues highlight the importance for hospital managers of reviewing current efforts to address the interests of HCWs, as well as developing effective strategies to retain and recruit ED staff.

This study further explores the associations between the factors of workplace concern and self-reported work-related injuries or diseases among ED HCWs. The Chi-square tests indicate that there are significant differences in the distributions of ‘inadequate security system and personnel’ ( $\chi^2 = 5.233$ ,  $df = 1$ ,  $p < 0.05$ ), ‘awkward postures/repetitive motions’ ( $\chi^2 = 9.620$ ,  $df = 1$ ,  $p < 0.05$ ) and ‘workplace health and safety has not been emphasised in ED’ ( $\chi^2 = 7.028$ ,  $df = 1$ ,  $p < 0.05$ ) between HCWs with reported work-related injuries or diseases and HCWs without reported work-related injuries or diseases ( $p < 0.05$ ) (see Table 6.9). As can be seen from Tables 6.8 and 6.9, it is interesting to note that the most common concerns about potential factors affecting OHS in ED workplaces seem to not distinguish between people with and without work-related injuries or diseases. ‘Too much noise’ is an example. A possible explanation for this might be that risk perception can affect individuals’ behaviour for self-protection (Arezes & Miguel, 2005; Gralton et al., 2013).

**Table 6. 9 Associations between workplace factors and work-related injuries or diseases among HCWs (N = 322)**

Workplace factors	Work-related injuries or diseases		$\chi^2$	df	p
	No n (%)	Yes n (%)			
<b>A. Physical environment and equipment supply</b>					
Inadequate provision of safety devices (e.g. sharps containers, safe needles, shields, slides)	6 (30)	14 (70)	2.357	1	0.125
Inadequate provision of personal protective equipment (e.g. clothing, gloves, masks)	7 (53.8)	6 (46.2)	0.287	1	0.592
Too much noise	59 (48.4)	63 (51.6)	0.249	1	0.618
Inappropriate work station design	34 (44.7)	42 (55.3)	0.136	1	0.712
Inadequate working space	46 (48.4)	49 (51.6)	0.183	1	0.669
Lack of facilities or access for employees / patients with disabilities	12 (52.2)	11 (47.8)	0.311	1	0.577
Litter or mess in working area	24 (41.4)	34 (58.6)	0.770	1	0.380
Inadequate toilet facilities	16 (36.4)	28 (63.6)	2.139	1	0.144
Inadequate isolation room to accommodate the patients with special health needs	40 (47.1)	45 (52.9)	0.010	1	0.918
Inadequate sink facilities and hand sanitizer	2 (25)	6 (75)	1.536 <sup>a</sup>	1	0.292
Inadequate security system and personnel	46 (38.3)	74 (61.7)	5.233	1	<b>0.022*</b>
Lack of private room for staff to take a break.	46 (46)	54 (54)	0.020	1	0.888
<b>B. Health service and management</b>					
Unclear standards of work procedure and safety regulations in ED	20 (58.8)	14 (41.2)	2.289	1	0.130
Inadequate training programs of occupational health and safety to address the needs at work	46 (42.6)	62 (57.4)	1.040	1	0.308
Lack of updated medical information related to the work	25 (45.5)	30 (54.5)	0.034	1	0.854
Lack of vaccination programs (e.g. flu, hepatitis vaccine)	3 (27.3)	8 (72.7)	1.707	1	0.191
Lack of routine health surveillance	26 (46.4)	30 (53.6)	0.001	1	0.980
Lack of clear instructions and effective occupational exposure	12 (35.3)	22 (64.7)	1.947	1	0.163

Workplace factors	Work-related injuries or diseases		$\chi^2$	df	p
	No n (%)	Yes n (%)			
management (prevention, report and follow up)					
<b>C. Work characteristics</b>					
Awkward postures / repetitive motions	51 (36.7)	88 (63.3)	9.620	1	<b>0.002*</b>
Shift work	57 (45.6)	68 (54.4)	0.079	1	0.778
Too much uncertainty and challenge at work	51 (48.6)	54 (51.4)	0.247	1	0.619
Heavy workloads	67 (41.6)	94 (58.4)	3.195	1	0.074
Contact with people affected by alcohol and drug	45 (45.9)	53 (54.1)	0.025	1	0.874
Inadequate time to take a break (toilet, eating)	80 (44)	102 (56)	1.162	1	0.281
Worry about facing unpredictable disaster or diseases with unknown transmission	47 (42.3)	64 (57.7)	1.225	1	0.268
Conflicts with other people at work (colleagues, managers, patients and family)	35 (38)	57 (62)	3.775	1	0.052
<b>D. Organizational aspects</b>					
Inappropriate leadership	23 (35.9)	41 (64.1)	3.638	1	0.056
Hospital does not consider staff opinion and needs in decision-making regarding workplace safety	41 (40.2)	61 (59.8)	2.448	1	0.118
Workplace health and safety has not been emphasized in ED	33 (35.1)	61 (64.9)	7.028	1	<b>0.008*</b>
Managers endeavor to improve quality of care for patients but ignore the rights and welfare among health care workers in ED	85 (43.4)	111 (56.6)	2.083	1	0.149
Long-term staff shortage or high turnover in ED	84 (43.8)	108 (56.3)	1.535	1	0.215
Difficulty in process of transferring patients after ED treatment (e.g. admission, transfer to other care units or hospitals)	47 (45.2)	57 (54.8)	0.120	1	0.730

a: There is more than 20% of total cells having expected count <5. The result is Fisher's Exact Test.

\*:  $p < 0.05$

Direct logistic regression was performed to assess the effect of a number of personal and workplace factors on the likelihood that participating HCWs would report work-related injuries or diseases. Six significant variables (marital status, job duration, physical health problems, inadequate security system and personnel, awkward postures/repetitive motions, and workplace health and safety not being emphasised in the ED) were analysed together. The results show that all predictors were statistically significant ( $\chi^2 = 31.931$ ,  $p < 0.001$ ) in distinguishing between the participating HCWs who did and did not report a work-related injury or disease. Among these six variables, only the variables of ‘physical health problems’ and ‘awkward postures/repetitive motions’ were statistically significant in work-related injuries or diseases (see Table 6.10). The results show that participating HCWs with physical health problems were 1.8 times more likely to report a work-related injury or disease than HCWs without physical health problems (95% CI 1.112 to 3.030,  $p < 0.05$ ). Moreover, participating HCWs who perceived that certain postures and repetitive motions were harmful were over twice more likely to report a work-related injury or disease than HCWs who did not (95% CI 1.321 to 3.497,  $p < 0.05$ ).

**Table 6. 10 Logistic regression - risk factors related to occupational injuries or diseases**

Variables	Odds Ratio	Sig.	95% CI
<b>Marital status<sup>a</sup></b>	1.372	0.232	0.816 – 2.307
<b>Job duration<sup>b</sup></b>	1.667	0.056	0.987 – 2.813
<b>Physical health problems<sup>c</sup></b>	1.836	<b>0.018*</b>	1.112 – 3.030
<b>Inadequate security system and personnel<sup>d</sup></b>	1.542	0.091	0.933 – 2.548
<b>Awkward postures / repetitive motions<sup>e</sup></b>	2.149	<b>0.002*</b>	1.321 – 3.497
<b>Workplace health and safety has not been emphasized in ED<sup>f</sup></b>	1.701	0.052	0.996 – 2.904

\*  $p < 0.05$

a: Referent is single.

b: Referent is less than 5 years

c: Referent is no physical health problems

d: Referent is no concern about inadequate security system and personnel

e: Referent is no concern about awkward posture / repetitive motions

f: Referent is no concern about workplace health and safety has not been emphasized in ED

### ***6.5 The findings of ED workplace observation***

Workplace observation provides a picture of the physical and organisational environment in EDs. A checklist of workplace observation in this study referred to the protocols of general workplace health and safety provided by sample hospitals. To better understand the working conditions and potential risks in EDs, workplace observations also included the researcher's perceptions. The observation points focused on several elements of the workplace: housekeeping, equipment/device provision and use, space design, security programs, and HCWs' interactions with patients and colleagues.

The physical environment was the first item of observation. All sample EDs had their own entry for the public and ambulances, which was distinct from the route for outpatient care service. Video recorders were found in the ceiling of this entry, and in the corner of each area in the EDs. A triage station was just near the entry. This was the initial location for assessing patients' health conditions according to an acuity scale of emergency department triage. Different compartments in ED—including a critical care room, trauma care room, general treatment area, observation area, irritable patients' protection room and toxic chemicals flushing room—were available to deal with patients with various needs for medical care. In each compartment, curtains were used to protect the patients' privacy and separate individual spaces. Generally, a small area with several chairs for patients and their family to wait was next to the triage station. According to the author's observation, the majority of family members preferred to stay close to the patient, rather than sit in the waiting area. Family members significantly contributed to an uncomfortable circumstance of overcrowding and excessive noise in the EDs. In contrast to this discomfort, the work sites were clean and orderly. The materials (such as syringes, sharps containers and drip bottles) for medical care purposes, as well as PPE (gloves, mask and gown) to protect staff from exposure to communicable diseases, were readily available at the workplace. Some EDs also provided simple and convenient work trolleys to facilitate HCWs' work in unpredictable situations.

In addition to observations of the physical environment, the author also noted that EDs are serious and tense care units, with HCWs rarely smiling broadly. The conversation between HCWs and patients/family members was concise. Most of the time, staff were occupied with providing medical care to meet the health needs of a number of patients. One or two uniformed safety officers stood around the ED to deter any inappropriate behaviour from

patients or relatives, and to protect staff and patients' property and safety. During the observation period, staff were sometimes completely free because no patients presented in the ED, while, at other times, the ED would suddenly become full of patients with different acuities of health problems. Moreover, patients move on quickly from the ED—either discharged or transferred to other care units.

During observation, an unpredictable and stressful event occurred in a regional hospital. A nine-year-old girl accompanied by her parents walked into the ED. Her chief complaints were nausea, vomiting and diarrhoea. Her vital signs were normal, and no special medical history was indicated by her parents. Soon, this girl received initial medical treatment of an intravenous drip and continuous observation of her vital signs. The ED physician diagnosed her as having acute gastroenteritis after confirming a normal blood sample and undertaking physical examination. However, during the discharge procedure, the girl suffered a seizure and lost consciousness suddenly. Three nurses and one physician attended to her promptly and performed appropriate emergency treatment. The parents were in a daze of anxiety as they stood outside the critical care room. Soon after an initial health condition check, the result of a CT scan showed a cerebellum haemorrhage, which was the reason that the girl's coma scale had dramatically dropped to three, and she had the seizure. Her parents could not accept the diagnosis and accused the medical team of negligence. They could not understand how common acute gastroenteritis could become a severe cerebellum haemorrhage. Unwilling to risk their daughter's likelihood of survival, the parents insisted on transferring her to a medical centre immediately. The original ED received a call back later to inform them of the further treatment of this case. Diagnosis was confirmed as a rare case of medulloblastoma in cerebellum, treated by an emergency craniotomy in the medical centre. The medical team in the original ED realised that this would be a case of medical dispute.

This event clearly shows that, although HCWs in EDs have competence with professional knowledge and skill-mix in care provision to cope with instantaneous changes of health condition among patients, it is still unlikely that they will be able to immediately diagnosis every health problem. The ED staff felt stress and frustration as a result of the family members' questioning and accusations, even though the medical team had undertaken the best work they were capable of doing.

To summarise the findings of the workplace observations, the significant issues associated with environmental layouts and working conditions in selected EDs are as follows:

- the ED is a workplace with security personnel and equipment to detect and prevent any inappropriate behaviours against HCWs and clients
- the ED is a care unit that is well designed to provide a prompt and multidisciplinary medical service to the public
- the ED is a care unit that relies on effective teamwork to perform emergency care for patients
- PPE that can protect HCWs from exposure to communicable diseases is readily available at the workplace
- the poor accommodation of family members likely produces an uncomfortable circumstance of overcrowding and excessive noise in EDs
- there is an absence of warm and friendly relationships between emergency HCWs and patients/family members
- dramatic changes in the health of patients and the unreasonable expectations of family members can create significant stress for HCWs in EDs
- unpredictable patient flow may cause sudden heavy workloads for HCWs in EDs

Such ED workplaces increase concerns for exposure to certain occupational hazards. For example, an uncomfortable environment (with overcrowding and excessive noise) resulting from poor accommodation of patients' relatives may easily provoke unanticipated assaultive behaviour against HCWs. Due to the nature of the work, dealing with sudden changes of patient flows and health conditions may cause great challenges to the physical and psychological tolerance of HCWs. Hence, creating a workplace in which HCWs can be free from the threats of occupational exposure is essential.

## **6.6 Conclusion**

This chapter has provided a brief profile of OHS status among HCWs in EDs, and identified a number of workplace risk factors affecting the staff's health and safety. In general, participating HCWs did not report serious physical health problems. However, HCWs' absence from work has a significant association with self-reported occupational hazard exposures. More than half of the participating HCWs had experienced work-related injuries



or diseases. The common exposures were MSDs, biological and psychological hazards. The results highlighted a prevalence of self-reported mental health-related problems that had not been recorded among the relevant group of workers in the statistics of the government authority.

Regarding the risk factors in workplaces, this study found that organisational aspects pose greater concerns for the health and safety of HCWs than other elements of workplace factors. Among personal and workplace factors, physical health problems and awkward postures/repetitive motions had statistically significant associations with the reports of work-related injuries or diseases among HCWs. Moreover, the findings of the workplace observations indicated that, although ED workplaces are generally well designed to facilitate health care delivery, the nature of the work demands and characteristics of the work increase concerns about occupational exposure among HCWs. Taken together, the results of this chapter enhance the understanding of current OHS status among HCWs in EDs. The following chapter will present the results of the most common concerns about occupational hazard in ED workplaces from different sources of data.

## **Chapter 7 Common Concerns about Occupational Hazards in ED Workplaces**

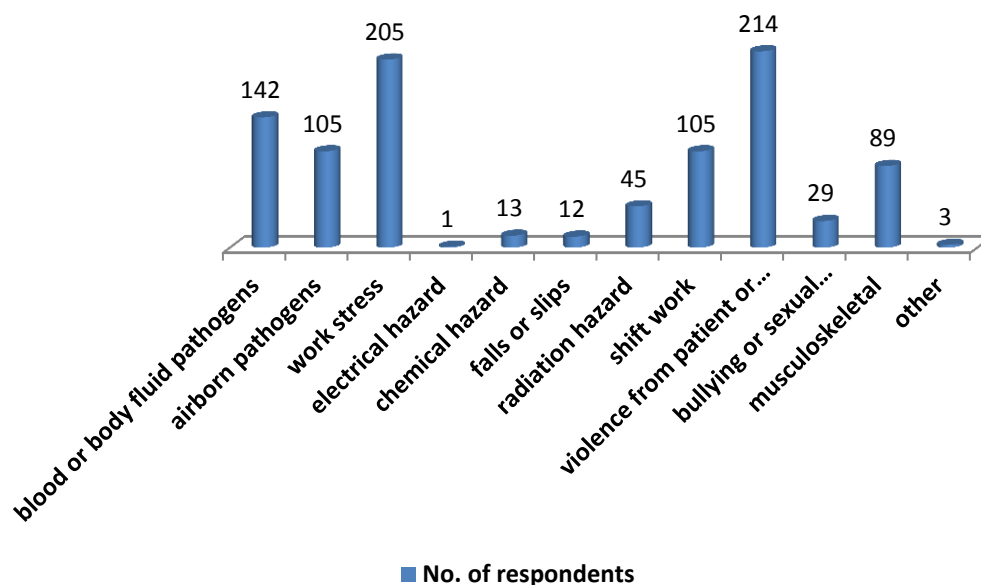
### ***7.1 Introduction***

OHS problems among HCWs in EDs can be attributed to multiple determinants. In addition to personal factors including health-related lifestyles/behaviours and physical health problems, occupational hazards have direct and significant effects on staff's health and safety. Chapter 6 presented the data about work-related injuries or diseases that had been experienced by ED HCWs. To facilitate identification of the specific issues regarding workplace health and safety, this chapter will continue to explore the common concerns or worries associated with the potential occupational hazards in ED workplaces through felt, normative and comparative needs assessment.

### ***7.2 The primary concerns about occupational hazards in EDs***

HCWs in EDs reported a variety of concerns about occupational hazards. The survey results show that the primary concerns of occupational hazards in EDs were 'violence from patients or their families, including physical and verbal violence' (n = 214; 66.7%); followed by 'work stress' (n = 205; 63.9%); 'blood or body fluid pathogens' (n = 142; 44.2%); 'airborne pathogens' (n = 105, 32.7%) and 'shift work' (n = 105, 32.7%). In comparison, only small groups were worried about the potential risk associated with 'chemical hazard' or 'falls and slips' (see Figure 7.1).

**Figure 7. 1 Primary concerns about occupational hazards among HCWs in EDs (multiple choice, N = 321)**



According to the survey results illustrated in Figure 7.1, approximately two thirds of the participating HCWs were concerned about either ‘violence from patients and their families’ or ‘work stress’ as threats to their OHS. These primary concerns about occupational hazards in EDs found in the felt needs assessment are consistent with the results of the normative needs assessment. Some experts expressed their viewpoints about the primary occupational hazards in ED workplaces:

The first occupational hazards are probably violence, followed by stress. Stress has become an important hazard recently. About the low back pain, because most health care workers are young, they don’t realise it. (Occupational diseases physician)

[The most frequent occupational exposure] is patient assault—that is, the patient’s agitation caused some injuries. This situation is quite common. Then comes job stress and needlestick. (Chief of OHS department #2)

Apart from violence and stress, needlestick/sharps injury was also a common concern among ED HCWs. However, interestingly, the threat of needlestick/sharps injury seems to be considered not so serious by experts:

The priority of needlesticks probably ranks lower. Actually, needlestick prevention does a pretty good job. The incidence rates of needlesticks are very low.  
(Occupational diseases physician)

This description is incompatible with the survey results because open wounds—including needlestick, sharps or cutting wounds—were reported as common experiences of work-related injuries by participating HCWs (see Figure 6.4). Moreover, approximately half of the participating HCWs (n = 142; 44.2%) were concerned about exposure to blood or body fluid pathogens (see Figure 7.1), which may result from needlestick or sharps injuries. This finding indicates a significant discrepancy in risk perception between HCWs and experts.

Although the primary concerns about workplace hazards in EDs are diverse, job stress and WPV from patients or their family members can be identified as the most common concerns, according to both the findings of the questionnaire survey and the major themes that emerged from the focus group discussions and expert interviews. The following sections present the data related to these two issues.

### ***7.3 WPV from patients or their family members***

Regarding workplace health and safety in EDs, violence from patients or their family members against HCWs was a significant concern. The participating HCWs recognised that they were vulnerable to violence during direct contact with patients and their family members in their daily work.

**{Following section includes the published paper, “The needs and potential solutions for improvement of workplace violence management in emergency departments in Taiwanese hospitals” have been removed from this copy for copyright reasons.}**

In order to comply with copyright pages 134-141 have not been published here.











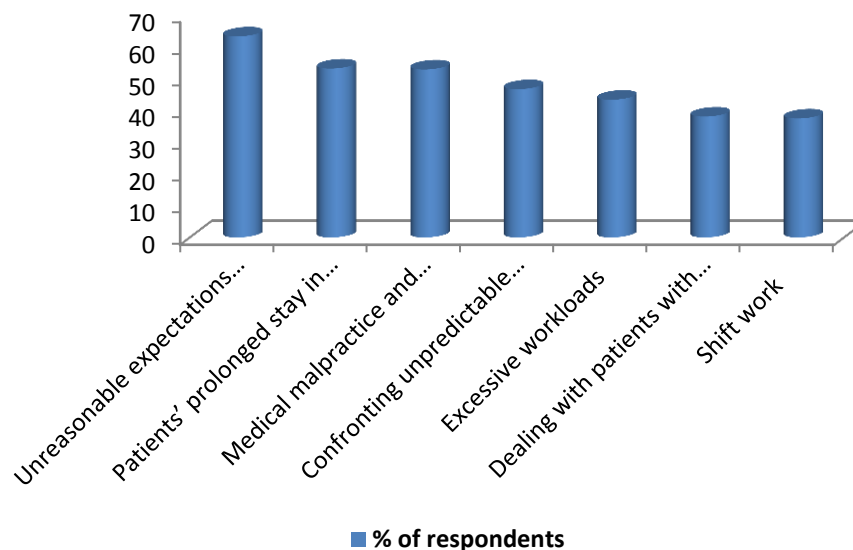




## 7.4 Job stress

In this study, job stress was another common concern as an occupational hazard in ED workplaces. The determinants of job stress are diverse. The results of the questionnaire survey show that, among a variety of workplace issues, ‘unreasonable expectations from the public’, ‘patients’ prolonged stay in EDs’ and ‘medical malpractice suits and disputes’ were the most common issues causing worry, nerves or stress to participating HCWs—63.2, 53.1 and 52.8% of respondents, respectively (see Figure 7.3).

**Figure 7. 2 Common workplace issues causing worry, nerves or stress (multiple choice)**



In qualitative data, the major themes related to job stress in EDs appear to be unpredictable patient flows and conditions, staff shortage, excessive workloads, unreasonable expectations, and worries about medical malpractice suits and disputes. These findings support the quantitative results and clarify the issue of job stress of HCWs in EDs.

### 7.4.1 Unpredictable patient flows and conditions

Unpredictability is a critical characteristic of ED work that requires professional capability, as well as physical and psychological readiness to provide a prompt health service for the public. However, this work characteristic was considered a primary source of stress by nearly half of the participating HCWs (n = 152; 46.6%):

Its [ED work] characteristic produces the greatest harm because of the explosive force. Sometimes the emergency department is suddenly full of patients with unpredictable conditions. Health care workers have to cope with the instantly erupted workload within the shortest possible time. This has a great impact on their physical and psychological aspects. (Director of Emergency Medicine Society)

Like yesterday, when the day shift was going to finish, I suddenly had three level one patients [triage scale]. I was too busy to care for them all at the same time. (Head nurse in ED #1)

Because of the characteristic of the emergency room, stress becomes difficult to remove. And sometimes it depends on your personal coping ability, as well as the severity of the patients' diseases. So there is really no way to remove it. (Occupational disease physician)

Because I am a family doctor, the pattern of patient care in emergency room is quite different to a ward. My experience was you have to act decisively and make the problem sequence clearly. Some very urgent problems you have to pick out. (Focus group #2)

These descriptions may indicate that stress is an inevitable occupational hazard in ED work.

#### **7.4.2 Problems of staff shortage in EDs**

Since an ED is a multidisciplinary medical care unit, effective teamwork is crucial for quality care delivery. However, some of the selected EDs were struggling with problems of staff retention and recruitment. The consequences of staff shortage pose great challenges to professional cooperation and the working atmosphere in EDs. These circumstances increase stress levels for HCWs. Many participants shared their perceptions in response to the inadequate staffing levels:

Staff quality should be taken into consideration seriously. But now we are facing staff shortage. Sometimes it is accepted if someone can just work, regardless of

their competence. But working together like that makes us very tired. (Focus group #2)

I think that is related to the professional quality of doctors. Sometimes we are so busy to deal with some non-urgent and unusual orders. You know, he just wants you to do that, regardless of how busy it is at that moment. (Focus group #1)

Manpower is what we need now. We also lack emergency physicians and require support from ward physicians. Actually, this has increased the burden on nurses because you have to adapt to the different working styles from relief physicians. This was quite troubling for a while in order to cooperate with them. I think this is not a long-term solution. The best way is to have fixed emergency physicians as soon as possible. (Head nurse in ED #3)

Currently, we have many new staff who should be sent out for training, but they have to wait until more staff are available. I hope all of them can stay longer, so that we can have more unspoken consensus and efficiency at work. Hopefully, this will relieve a little bit of the work stress. (Head nurse in ED #2)

In addition to the agreement that staff shortages have negative effects on ED teamwork efficiency, some participating HCWs expressed concerns that staffing shortages could have more significant effects on personal and family life. In this study, more than half of the respondents (51.8%) were married. These HCWs may need more flexible shift schedules to address their family responsibilities. However, the effects of insufficient staffing levels not only affect the nature of rosters among HCWs, but also increase the difficulty of meeting the special needs of individual workers:

We only have days off on weekdays, but family gatherings are definitely on weekends. If you need leave on more than one weekend, then you have to make a decision or negotiate with colleagues. Although we try to do it this way, it is also a problem. (Focus group #9)

I think the patient and staff ratio is not well thought out for us. In fact, more emergency patients show up on weekends or holidays [when fewer staff are

rostered]. It is unfair for nurses to work on holidays. It becomes a dilemma to arrange more nurses to work or sacrifice their vacations. (Head nurse in ED #3)

Now the manpower in emergency department is not enough. In addition to administrative work, I have to share two to three weekend shifts or other people cannot get rest. But there is no way to attend school parents meeting, so my kid feels like nobody wants him. (Chief of ED #2)

The negative influences on teamwork efficiency in providing quality care, as well as on personal and family life, make staff shortage a significant stressor at work for ED HCWs. This result highlights the importance of hospital managers treating the issue of staff shortage in a serious manner because it has profound effects on ED operation and, importantly, increases concerns about exposure to job stress among HCWs.

#### **7.4.3 Excessive workloads from ED overcrowding**

ED overcrowding can cause heavy workloads for HCWs and compromise the primary function of EDs. Many participating HCWs perceived that the difficulty in transferring patients after emergency treatment results in more prolonged stays in EDs. This is because the problems of staff shortage not only concern EDs, but also emerge in other care units. Unfortunately, because of the duties of work, HCWs in EDs are more likely to bear the consequences of inadequate staffing levels. Patients' prolonged stay in the ED was considered a significant stressor by more than half of the participating HCWs (n = 173; 53.1%):

Generally, patients tend to live in health insurance beds, but if there is no patient discharge from wards, how will beds be made available? Such problems happen, so more and more patients must stay in emergency department to wait for a bed. (Focus group #3)

Because of serious staff shortage problems, they [staff in wards] sometimes are too busy to deal with patients immediately, but this causes additional workloads for ED. And the relationship between patients and us also becomes tense. They misunderstand us and ask us how long until they can go to the ward. We are responsible for explaining the situation to patients, but also have to keep tracking

this bed [to see if the patient can go up to the ward]. This makes us busier. (Focus group #5)

I hope the turnover rate of hospitalisation can be quicker. Other units have to back us up to ensure the function of emergency department is running well. Otherwise, we will be busy with patients' complaints and their mood. Other work cannot be done. (Head nurse in ED #3)

These data suggest that addressing staffing levels, effective bed management, and support from other care units may be potential solutions to ensure reasonable workloads for HCWs in EDs.

#### **7.4.4 Unreasonable expectations of emergency care service**

More than three fifths of participating HCWs ( $n = 206$ ; 63.2%) identified unreasonable expectations and requests from the public as a stressor. They were uncomfortable about such expectations and found them difficult to address in ED situations. In addition, importantly, unreasonable requests from patients may conflict with the criteria of emergency care provision:

Our government tells people that our health insurance is the best in the world. We pay the lowest premiums, but enjoy world-class medical service. This leads to people not appreciating medical service. People have to wait to see a doctor in the outpatient clinic, so they go to emergency department. This is because emergency department is the most convenient place in the hospital, and the National Health Insurance Bureau welcomes people's complaint if there is any dissatisfaction with medical service. So if a patient waits for five minutes without seeing a doctor, he makes a complaint immediately. (Occupational disease physician)

Patients come to the emergency room and tell us what we have to do immediately. They don't understand that we deal with patients according to the triage scale. But here people believe that the reason I come to the emergency room is to quickly see the doctor. Why do I have to wait? (Head nurse in ED #2)



Everything must be fast. And they want us to take care of them like a VIP [very important person]. (Focus group #1)

In other countries, ED waiting time may be more than five or six hours if the patient is triaged as level four or five. In contrast, it only takes one hour in Taiwan. (Director of Emergency Medicine Society)

They think they are buying medical services, rather than seeking medical help. (Focus group #3)

In the care process, some patients are dissatisfied with service, so we are very careful. I don't think there is anything wrong with our service, but people expect a lot. If we don't reach their expectations, they will be unhappy and call the complaint hotline directly. (Focus group #6)

These descriptions indicate how HCWs can become frustrated by unappreciative attitudes towards the emergency care service, as well as the poor concept about the mode of priority care provision in EDs held by some of the public. Moreover, the cognitive discrepancies regarding ED services easily provoke arguments between HCWs and patients:

I told him that his condition does not meet the criteria of emergency visits, but he couldn't accept it and kept arguing with us. Similar situations have been happening every day. (Focus group #2)

People have to learn that the emergency department is not a shopping centre that you can go to at any time. Yesterday, I had a patient with abdominal pain for two weeks. Just because the pain has continued for a while, he came to visit for help. (Chief of ED #1)

Respondents also expressed the belief that hospital executives tend to comply with the requests of patients, rather than respect professional judgements and positions. This attitude was identified by respondents as a challenge to work values:

They think medical care is the same as business service, so we just need to make patients happy to stay, then healthy to leave. The hospital executives believe that

this is a quality service, but they have not thought about our feelings. (Chief of ED #3)

There is no way to change that. For revenue, the hospital sometimes chooses to comply with unreasonable requests and asks us to do so, but this means that we are very poor, very humble [we are not respected]. (Focus group #1)

In terms of the public expectations of emergency care service, these complaints indicate a significant gap between what HCWs can offer and what the public wants.

#### **7.4.5 Worries about medical malpractice suits and disputes**

Worries about medical malpractice suits and disputes also contributed to concerns associated with the stress of care provision for half of the participating staff (n = 172; 52.8%). The following statements indicate their perceptions about this issue:

The most important thing is the medical care disputes. Our unit has more cases than others. We were charged with malpractice, but we don't know why. I don't understand. We just followed the standards of operation procedure. (Focus group #8)

Last time, a patient held a cell phone to record what we did and what we said in the whole care process. This made a big stress for our doctor. If you face the same circumstance, are you comfortable with that? You have to be very careful about everything. (Head nurse in ED #3)

The fear of medical litigation influences staff retention and recruitment in EDs, particularly for physicians. As stated by the participants:

Now the biggest challenge is physicians are not willing to work in the emergency department, even if we would like to pay more salary. The primary reason is the fear of the litigation. In fact, it is very difficult to have an accurate diagnosis for each disease within a short time, but if the patient dies, the family will accuse you of not diagnosing. This is really a hard job—no one can do it in a perfect way. (Hospital executive)

Everyone is afraid of medical disputes, especially under the situation of insufficient manpower. Who would dare to work in emergency department? The emergency physicians must carry so much responsibility. Nobody would like to work there.  
(Occupational disease physician)

The issue of medical malpractice suits and disputes has profound effects on stress levels among HCWs and, importantly, may lead to an endless cycle of staff shortage that will eventually lead to the breakdown of normal ED operations.

#### **7.4.6 Associations between workplace issues and self-reported mental health-related problems**

Workplace stressors in EDs are complicated and difficult to prevent, but have significant effects on the mental health of emergency HCWs. This study sought to test the associations between workplace stressors and self-reported mental health-related problems. As the data presented in Chapter 6 show, about one quarter of participating HCWs who experienced work-related injuries or diseases reported mental health-related problems, such as excessive stress, depression and anxiety ( $n = 42$ ; 24.2%). Among the variety of workplace issues, unreasonable expectations from managers ( $\chi^2 = 6.120$ ,  $p < 0.05$ ), shift work ( $\chi^2 = 10.055$ ,  $p < 0.05$ ) and excessive workloads ( $\chi^2 = 8.690$ ,  $p < 0.05$ ) had significant associations with self-reported mental health-related problems (see Table 7.2).

**Table 7. 1 Associations between workplace issues and mental health-related problems**

Workplace issues	Mental health-related problems		$\chi^2$	df	p
	No n (%)	Yes n (%)			
Unreasonable expectations from the public	176 (62.0)	30 (71.4)	1.407	1	0.236
Unreasonable expectations from the managers	17 (6.0)	7 (16.7)	6.120	1	0.013*
Shift work	97 (34.2)	25 (59.5)	10.055	1	0.002*
Overtime	51 (18.0)	12 (28.6)	2.644	1	0.104
High speed work process	52 (18.3)	10 (23.8)	0.719	1	0.397
Too much responsibility	84 (29.6)	18 (42.9)	3.001	1	0.083
Unpredictable number of patients	133 (46.8)	19 (45.2)	0.037	1	0.847
Unpredictable communicable diseases	81 (28.5)	8 (19.0)	1.655	1	0.198
Too many changes and uncertainties on work	79 (27.8)	17 (40.5)	2.822	1	0.093
Excessive workloads	114 (40.1)	27 (64.3)	8.690	1	0.003*
Patients' prolonged stay in EDs	146 (51.4)	27 (64.3)	2.436	1	0.119
Medical malpractices or disputes	146 (51.4)	26 (61.9)	1.617	1	0.203
Poor relationships with colleagues	33 (11.6)	6 (14.3)	0.247	1	0.619
The collaborations between EDs and other care units	54 (19.0)	9 (21.4)	0.137	1	0.711
Work-related injuries and diseases	72 (25.4)	15 (35.7)	2.008	1	0.156
The demands of professional knowledge and skills to provide care	24 (8.5)	4 (9.5)	0.054	1	0.817
Dealing with patients with alcohol or drug abuse	105 (37.0)	19 (45.2)	1.061	1	0.303
Dealing with patients with psychological diseases	64 (22.5)	9 (21.4)	0.026	1	0.872
Dealing with deaths	21 (7.4)	4 (9.5)	0.234	1	0.628

\* $p < 0.05$

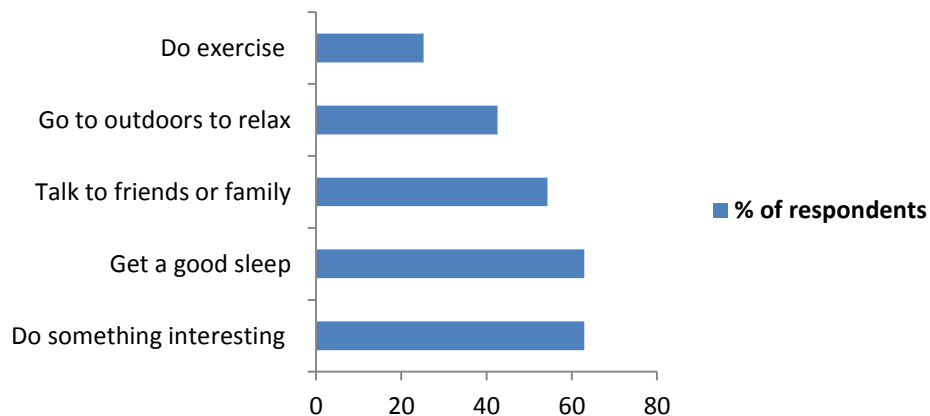
#### **7.4.7 Stress interventions**

As indicated by the data presented in the previous sections, job stress seems difficult to prevent in ED work. With respect to current stress interventions in hospitals, this study's qualitative results indicate some common organisational interventions to address job stress, including:

1. in-service education programs (such as techniques of physical relaxation and methods of effective time management)
2. psychological counselling services
3. health promotion programs (such as fitness clubs and smoking or alcohol cessation groups)
4. regular employee excursions or dinners

However, the survey data indicate that the majority of participating HCWs tended to deal with work-related stress individually. The common methods of stress release were 'doing something interesting' (n = 205; 62.9%), 'having a good sleep' (n = 205; 62.9%) or 'talking with friends or family' (n = 177; 54.3%) (see Figure 7.4). Only a few HCWs spoke to the relevant managers (5%) or attended classes of stress management (2%). The prevalence of individual coping strategies may be attributed to the majority of stress interventions being more likely to focus on assisting individual workers to improve their resistance to job stress. Nevertheless, evidence in association with negative coping methods for stress release was not found in this study.

**Figure 7. 3 Frequency distribution for common methods of stress release**



To investigate the needs for further development of stress interventions, this study's comparative needs assessment used a report from the NIOSH (2008b) to examine current methods of stress management for HCWs in Taiwanese EDs. This report indicates that the most commonly implemented stress interventions in health care settings include the following.

#### *7.4.7.1 Organisational change interventions*

It is important to focus on team process or worker participation:

- workers need to participate in the decisions and actions affecting their jobs
- workers need to receive clear information about their tasks and role in the department.

Multidisciplinary health care teams enable emergency HCWs to:

- deliver services efficiently without sacrificing quality
- promote innovation by exchanging ideas
- integrate information in better ways.

The conditions for successful organisational change interventions include:

- involving workers at all stages of the intervention (development, implementation and evaluation)
- significant management commitment
- a supportive culture for stress interventions
- periodic evaluations of stress interventions.

#### *7.4.7.2 Worker-focused interventions*

Worker-focused interventions often consist of stress management techniques such as the following:

- training in coping strategies
- progressive relaxation
- biofeedback
- cognitive-behavioural techniques
- time management training
- interpersonal skills development.

The results of this study suggest that current stress management in Taiwanese EDs is predominated by worker-focused interventions to assist HCWs to deal with job stress. However, such interventions may lose effectiveness over time if the workplace stressors cannot be removed. The NIOSH (2008b) suggested that a combination of organisational change and worker-focused interventions is the most successful approach for reducing job stress in hospitals. Regrettably, evidence of organisational change in terms of proactive reduction of workplace stressors was difficult to find in this study. For further development of effective stress interventions in EDs, more efforts towards organisational change are required.

### **7.5 Conclusion**

This study found that, although HCWs in EDs were concerned about a variety of occupational hazards, ‘WPV from patients or their family members’ and ‘job stress’ were highlighted in different sources of data and identified as the primary issues associated with workplace health and safety in EDs.

**{Following paragraph includes the published paper, “The needs and potential solutions for improvement of workplace violence management in emergency departments in Taiwanese hospitals” have been removed from this copy for copyright reasons.}**

In addition to WPV, factors related to unpredictable patient flows, staff shortages, workloads, unreasonable expectations of care service, and medical malpractice and disputes caused job stress in EDs. However, the evidence from this study suggests that worker-focused

interventions have been the most common form of stress reduction in the sampled ED workplaces. More organisational efforts to proactively reduce the sources of job stress are required, such as providing adequate staffing levels, effective hospital bed management to reduce workloads, and clear information about the tasks and roles in an ED to improve the public's knowledge of emergency care services.

The risk determinants of job stress and WPV from patients or their family members were found in this study to be multiple and interrelated. The lack of effective interventions to deal with such complex causation has made these problems significant. In this regard, further plans and efforts should be made towards integrative and systematic approaches to develop concrete and practical strategies to effectively address the issues of WPV and job stress in EDs. The next chapter will explore current OHS management in hospitals.



## **Chapter 8 Workplace Health and Safety Management in Hospitals**

### ***8.1 Introduction***

The nature of work has made HCWs in EDs vulnerable to various occupational hazards. To minimise the risks of occupational hazard exposure, the role and function of health and safety management in hospitals is crucial. What is required is proactive detection and prevention of occupational hazards, as well as appropriate response to the workplace accidents and maintenance of staff health. To identify the needs of workplace health and safety, this chapter uses felt and normative needs assessment to examine current efforts at occupational health improvement and workplace risk reduction for HCWs in hospitals. The data presented here can be divided into two parts: (i) health and safety programs for HCWs and (ii) barriers and challenges to successful health and safety management.

### ***8.2 Health and safety programs for HCWs***

Workplace health and safety programs are crucial to promote occupational health and manage hazard exposures for HCWs. This section presents the relevant data about the common health and safety projects that are ongoing in hospitals, as well as the health interests among HCWs in EDs, and the effectiveness of the incident reporting systems.

#### **8.2.1 Common programs to improve HCWs' health and reduce hazard exposure**

All participating hospitals in this study had implemented a variety of worksite health promotion programs to improve or maintain health for their employees. These programs not only focused on HCWs' physical health and health-related behaviours, but also considered their psychological needs, such as coping with stress. The following comments illustrate the measures taken:

In the beginning, we encourage employees to give up smoking, lose weight, use the elevator less and take the stairs. These are very important for their health. Recently, we promoted a vegetarian day per month to improve health. In fact, these activities are underway. (Hospital executive)

We have organised a health walking activity. We have also encouraged staff to climb the stairs. There are basketball and badminton courts just behind the hospital for

everyone to use. Another thing is we also have employee excursion activities, which are all health promotion programs. (Head nurse in ED #3)

Our hospital has a gym, yoga and photography clubs to help you to relieve stress. (Head nurse in ED #1)

This year we put the focus on weight management and exercise. In addition, we have some programs for outdoor recreation, like one-day excursion or hiking for staff. Photography club and yoga club are for staff to relieve stress. (Chief of health promotion department)

The interviewed experts agreed that, in addition to the routine health reviews that are required by the Occupational Safety and Health Act to collect health data among staff, hospitals have generally provided additional health services to help managers protect HCWs' health conditions and detect health problems:

We require our workers to log in their body weight and waist circumference every month. The BMI will be automatically converted to remind you if you are overweight or not. Another one is body temperature detection during flu or previous SARS epidemic. (Chief of health promotion department)

The vaccination program of Hepatitis B is always available for staff who are not immunised. In the season of influenza pandemic, we push and encourage staff to take a voluntary injection. These vaccinations are all free to them. (Chief of OHS department #2)

[If employees have psychological needs], we provide a counselling hotline for them. It is mostly by a psychiatric or psychological physician in charge. (Hospital executive)

In addition to health promotion programs, the results of this study show an acknowledgement of the traditional OHS approach to improve health and reduce hazards exposure for HCWs.

### 8.2.2 Health interests regarding WHP among HCWs

This study also attempts to explore the health interests among HCWs in EDs to evaluate the practicality of the existing WHP and provide directions for further program designs. The results show that more than half of participants (n = 178; 54.6%) expressed interest in WHP activities, and more than half (n = 170; 52.1%) preferred to attend the WHP sessions after working hours. However, only one fourth (24.5%) indicated that they were willing to pay to participate in activities (see Table 8.1).

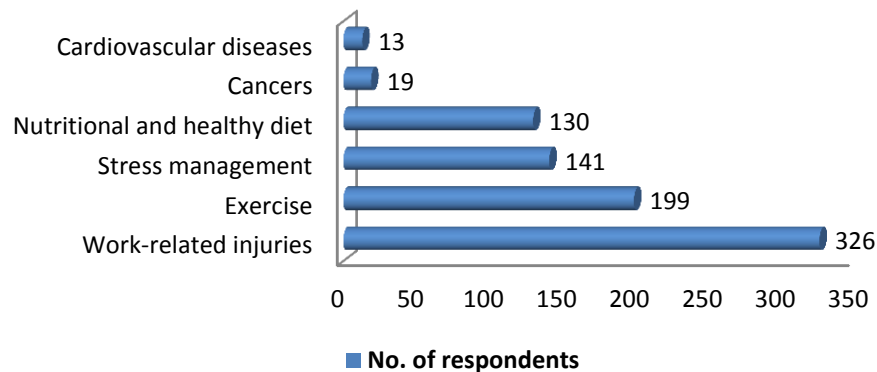
**Table 8. 1 Levels of interest in participation in WHP among ED workers**

<b>Variable</b>	<b>n</b>	<b>%</b>
<i><b>Interested in WHP activities</b></i>		
Yes	178	54.6
No	146	44.8
Not indicated	2	0.6
<i><b>Preferred time to attend WHP sessions</b></i>		
During working hours	154	47.2
After working hours	170	52.1
Not indicated	2	0.6
<i><b>Willing to pay for participation</b></i>		
Yes	80	24.5
No	246	75.5

The following figure demonstrates the most common topics of interest regarding WHP among emergency HCWs. The results show that the topics regarding work-related injuries, exercise and stress management were common. One unanticipated finding was that ‘work-related injuries’ caught the attention of all participating HCWs (100%) regarding WHP programs. More than 60% of respondents expressed interest in ‘exercise’, and around 40% were interested in ‘stress management’ (see Figure 8.1). These results may be interpreted as HCWs perceiving that programs to reduce workplace hazards and promote health will remain important in the future design of WHP. Moreover, although many programs to address HCWs’ health and safety have been implemented in hospitals, there is a gap between what HCWs

want and what employers provide in the existing programs. Section 8.3 presents more information related to this point.

**Figure 8. 1 Common health interests regarding WHP among HCWs (N = 326, multiple choice)**



### ***8.3 Barriers and challenges to successful health and safety management***

As the previous section shows, there is acknowledgement of a variety of workplace programs that aim at health improvement and risk reduction for HCWs in hospitals. However, respondents expressed more concerns about the barriers and challenges to the expected outcomes of successful OHS management. These concerns included the effectiveness of the incident reporting system, the nature of the work, individual risk perception and behaviour, in-service education and training schemes for risk prevention, the support of hospital executives to create a health and safety workplace, and the provision of and access to health programs.

#### **8.3.1 The effectiveness of the incident reporting system**

An incident reporting system is a crucial program and useful tool to monitor the incidents of hazard exposure in hospital settings. However, the effectiveness of the system can be problematic. Respondents in this study had different perceptions regarding responses to an incident report. For instance, participants in one focus group indicated that advanced computer technology makes the procedure more efficient and easier to follow up:

The computer system will notify relevant people. Our infection control personnel will review surveillance data and the unit manager will know how many people have to be traced and when to do it. If you don't go [for follow-up] they will ask your reason. So our follow-up procedure is doing very well. (Focus group #3)

Moreover, the chiefs of OHS department in hospitals mentioned the actions taken after reporting an incident. For example:

We make regular calls to care for the employee in order to understand when they can return to work. If it is a needlesticks injury, we will continue to follow until the end of the entire process, including preventive injections or tracking data. (Chief of OHS department #2)

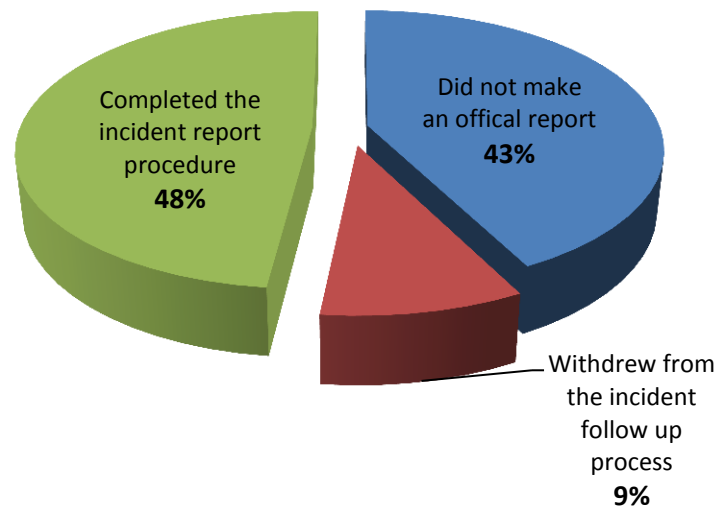
If an incident occurs, the occurring unit has to write a PDCA<sup>2</sup> to improve, no matter what kind of situation is. The relevant departments will then do a continued tracking based on worker's physical condition. (Chief of OHS department #1)

However, these efforts at post-exposure management did not seem to reflect compliance with the incident reporting procedure of the participating HCWs. A striking result that emerged in the questionnaire survey was that, while 173 participating HCWs (53.1%) reported experiences of occupational injury or disease, less than half (n = 83; 48%) completed the incident report procedure. Forty-three per cent did not even make an official report, and 9% began the procedure, but withdrew from the incident follow-up process (see Figure 8.2).

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<sup>2</sup> PDCA: 'Plan-Do-Check-Act'. This is a management measure for the control and continuous improvement of process.

**Figure 8. 2 Completion of an incident report by victims (N = 172)**



These data not only provide information about HCWs' reactions after an incident, but also imply that the actual prevalence of occupational injury and disease among HCWs in hospitals is significantly underestimated. Regarding the current management of occupational exposure, some experts expressed their concerns about defects in the reporting system:

Currently, reports of needlesticks injury are done very well. Aside from needlesticks injury, others occupational exposure, like musculoskeletal pain and workplace bullying, are rarely reported. (Hospital executive)

Report of lower back pain is too subjective, but the prevalence is quite high. Lower back pain has been identified as an occupational hazard in the United States, but we don't include lower back pain under occupational hazard because of lack of clear diagnostic criteria in Taiwan. (Occupational disease physician)

Similarly, some respondents in the focus groups shared experiences of confusion and inconvenience in reporting an incident:

I did not report my neck and shoulder pains because there was no way to prove my neck was hurt through patient transportation, and this seems not to be included in the report items. (Focus group #8)

The procedure is too complex and a written report takes a long time. (Focus group #2)

For needlestick, we can't stop everything right away. The patient might have already been discharged to home, and then you think, it is not only I who has to take a blood sample, but also that patient does. But you are unlikely to call him back again for this matter. (Focus group #9)

Further, statements from other interviews—including lack of transparent operations and poor solutions to the problems—raised a common question about the success of the incident report system:

They [HCWs] believe that it is useless to report an incident. It only tells them to take a medicine and take a rest, but there is no good measure to protect them. So this is the reason why health care workers would not like to or not want to report. (Director of Emergency Medicine Society)

We don't know exactly who will receive the report. Nobody tells us the consequences. Many things we have to figure out by ourselves. So, do you think a report is useful? (Focus group #8)

For any incident, you should inform [the management], but nothing happens next. So they only collect the data, but cannot find out the solutions. (Chief of ED #1)

The results show that, although an incident reporting system has been established to detect the risks of hazardous exposure in hospitals, general dissatisfaction with the function and outcome of incident reports was more likely to lead to low compliance with the reporting procedure among emergency HCWs.

### **8.3.2 The nature of work**

The nature of work in EDs was considered a primary challenge to successful health and safety management for HCWs. The majority of participating HCWs believed that they had the best knowledge about self-protection from occupational exposures. However, in some circumstances, injuries occurred due to unexpected accidents. One participant shared an experience of unpredictable injuries caused by the nature of the work process:

I can give one example: our physician was doing wound suture, but the patient's hand was moving. Suddenly, the needle stabbed the nurse when she was trying to clutch the patient's hand. (Head nurse in ED #1)

Another participant commented that injuries frequently occur when the department is very busy or the work is very urgent:

Sometimes the situation is very urgent—it is impossible to get slide sheets.<sup>3</sup>

Normally, we pull the bed sheets to move the patient straight away. (Focus group #1)

Some experts confirmed this point, and made more comments about the relationship between the nature of the working conditions and the risk of hazard exposures:

It is because of the large volume of work. It's too busy. So [when they want] to save a little time, an incident [needlesticks] happened. (Chief of OHS department #1)

I think it is really difficult to prevent. Sometimes they go to work tired or they may not concentrate, then an incident is more likely to occur. Like needlesticks injuries usually happen at the end of night shift. They may be very tired and sleepy. (Chief of OHS department #2)

In an emergency department, stress and workload is high, which produces the great chance of back pain and musculoskeletal injuries, but also increases the accidents of needlesticks. Moreover, overcrowding problem causes poor air circulation. The airborne diseases such as TB threaten health care workers. (Director of Emergency Medicine Society)

In fact, the emergency room has cameras and [the number of] our staff is also quite sufficient. But you never know when violence occurs. After the event, you can't really say whose fault it was. All we can say is that there are some irrational people. (Occupational disease physician)

In addition, risk information is frequently limited and difficult to obtain promptly in ED clinical practice. This increases the difficulties of effective risk prevention for HCWs. Some

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<sup>3</sup> A slide sheet is used for turning patients in bed or sliding them up the bed.



staff mentioned concerns about the potential for unanticipated hazard exposure during direct contact with patients:

I think in the frontline care, many things are uncertain. This is because patients do not tell you honestly about their health conditions. The health insurance card does not have any specific record because that has been considered as part of patient's privacy. So if they don't say it, we will not know. (Focus group #5)

Sometimes patients visit emergency department with tuberculosis or HIV. We simply do not know in advance. That's what I worry about. (Focus group #4)

### **8.3.3 Individual risk perception and behavior**

Individual risk perception and behaviour can influence the outcomes of OHS management in EDs. This study found that the perception of the difficulties in preventing hazard exposure because of the nature of work in EDs contributed to a strong awareness of hazard exposure among emergency HCWs, as indicated by the following statements:

It is very difficult in the emergency department. So we learn to protect ourselves just fine. (Focus group #7)

It should be said this is a potential risk. All we can do is take care to avoid any hurt. Needlestick injury cannot be accepted as unlucky or explained as our fate. Each emergency patient should be considered as a case of HIV. (Focus group #7)

Even so, the significant inconsistency to emerge from the data is that, in some cases, judgements regarding protective behaviour were influenced by the HCWs' previous experiences and current work situations, rather than their risk perceptions. The minority of HCWs explained that:

It was too busy. When many patients have been coming in incessantly, you totally forget to protect yourself. Just hope things can be done quickly. (Focus group #2)

Basically, they should follow the SOP,<sup>4</sup> but sometimes it is too busy—some details are skipped. They use the simple and fast way to do things according to their own personal experience. The senior staff usually do that. (Head nurse in ED #3)

These data reveal that there is a gap between perceptions and actions, which is significant in dealing with risk exposure among ED HCWs. This significant gap was also noted by the experts. According to the experts, the majority of work-related injuries were attributed to poor compliance with standards of work, and self-judgement regarding the risk of occupational exposure among HCWs. Two experts mentioned that:

Sometimes when we review the hazard notification, we realise that they are so careless. We have emphasised no needle recapping and done many training programs, but the common reason of sharp injury is still recapping. This means that, although they have professional knowledge, they did not apply it in the work. (Chief of OHS department #1)

Health care workers may think that [the injury] is not serious and do not have a strong awareness that it is an occupational exposure. (Director of Emergency Medicine Society)

These quotations suggest that individual risk perception and behaviour can be identified as a barrier to the effective risk preventions in EDs. To address effective OHS management in hospitals, individual determinants must be considered seriously.

#### **8.3.4 In-service education and training schemes for risk prevention**

There were several issues related to in-service education and training schemes to address the outcomes of OHS management. The practicality of in-service education and training to improve individual workers' knowledge and skills for exposure prevention were commonly mentioned by participating HCWs:

We started a violence prevention course this year. But not the same circumstance, not the same event are encountered [in our workplace]. The solutions are totally different too. So it is not very useful. (Focus group #1)

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<sup>4</sup> SOP: 'standard operation procedures'.

Because theory is just theory. The reality is different and we cannot apply it [the theory] properly. (Focus group #9)

These statements indicate that HCWs focused on the difficulties of applying theory in clinical practice, rather than the benefits attained from these education and training programs. This finding indicates the importance of addressing real conditions in the courses in order to enhance the applicability of and compliance with education and training programs.

Concerning appropriate arrangements of in-service education and training programs, the participating HCWs expressed a need for a flexible schedule. This is because the majority of HCWs work different shifts, and new recruits start work in different phases, which means they may miss some routine courses:

It is impossible for everyone to participate. The schedule is usually difficult to fit with our shifts, so there is no way to attend all the courses. (Focus group #7)

We have education and training programs every year that are running routinely. But, after all, there are some new staff who need additional training. (Head nurse in ED #1)

It [the hospital] opens courses for the entire health care workers. It does not have courses only for your unit because there may be only one or two new staff in your unit. (Focus group #1)

The existing in-service courses are dominated by providing professional training in medical practice and knowledge to address the quality of care provision for patients. In contrast, HCWs' desire to train for self-protection from occupational exposures does not seem to be properly met:

We really received few occupational safety and hazardous prevention courses, but other training is okay. We usually send nurses to attend the training courses on the ACLS, ETTC and APLS.<sup>5</sup> (Head nurse in ED #1)

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<sup>5</sup> Terminologies of advanced medical training—ACLS: Advanced Cardiac Life Support, ETTC: Emergency Trauma Training Course and APLS: Advanced Pediatric Life Support.

Nurses should be taught how to deal and get along with patients. Some nurses are too young and inexperienced. Education and training must help them know where the problem is and how to avoid the risk. This is the purpose we want. (Chief of ED #2)

These descriptions suggest that future in-service courses should pay more attention to the specific needs for self-protection from occupational hazard exposures among participating HCWs in order to enhance the outcomes of OHS management.

### **8.3.5 Support of the hospital management in creating a healthy and safe workplace**

The support of hospital management plays a crucial role in OHS management. The results of this study indicate inadequate support from hospital management to create a healthy and safe workplace, as a result of restraints on operational funding from the NHI:

I am worried that it [creating a healthy and safe workplace] will increase operation costs in the hospital. This situation will make the manager, of course, not do it unless it is compulsory ... Now the National Health Insurance is in complete control of the budget, it causes a budget squeeze effect [in hospital operation costs]. This is an inevitable consequence. And we are in a dilemma to make policy decisions. (Hospital executive)

If health insurance permits more funds for emergency departments, then we can have more improvement strategies, like work space and human resource improvements. So the working environment [in ED] will become better. But the key point is still the National Health Insurance support [is inadequate]. (Occupational disease physician)

In addition, the lack of a strong policy to mandate that hospitals place importance on workplace health and safety affects hospital executives' motivations to implement programs for hazard prevention and health promotion and create a culture of safety in the workplace for HCWs:

Current in-service education and training for health care workers rarely look at occupational hazards. This is because hospitals are guided by the accreditation

regulations. As long as the regulation requires something, hospitals will absolutely comply with it, but the part about occupational hazards hasn't been strongly required in hospital accreditation so far. (Director of Emergency Medicine Society)

The service provision regarding occupational exposure in hospitals basically follows the Act only. This is because a hospital is a medical institution. It probably will not admit to being an occupational accident victim. So hospital managers would not emphasise how dangerous this workplace is. If they so stressed this point, it would cause panic. The feelings about the work among staff would not be so good. Therefore, the risk information [about occupational hazards in hospital] is not so transparent or completely released to the staff. (Occupational disease physician)

I think it could be hard to create a culture of safety for staff voluntarily in hospital settings because the hospital policies currently only emphasise patients' safety. For a long time, health care workers are supposed to be self-sacrificing and dedicated, so a culture of safety for staff is hard to create in one or two days. (Occupational disease physician)

Although the budget squeeze effect resulting from the restraints on operational funding from the NHI may influence resource distribution between care units in hospitals, a hospital executive expressed his belief that an ED should remain the priority unit for resource allocation in order to address the specific workplace needs, due to its unique and crucial role in the hospital care service:

The emergency department is very, very important for the entire hospital's operations. About 30 to 50% of hospitalised patients come from the emergency department. This part accounts for a large proportion of hospital revenue. The superintendent in a large hospital will attach importance to this unit. So it gets priority for supply of everything, but also many plans for back-up support. (Hospital executive)

Thus, as these data show, certain conditions—including funding support and the relevant policies—affect hospital managers' intentions to create a healthy and safe workplace for HCWs. Nevertheless, an ED was recognised as a priority unit to address the specific workplace needs. This finding suggests an opportunity to fight for development of effective

OHS management that considers the specific needs of health improvement and risk reduction for HCWs in EDs.

### **8.3.6 Provision and access to health programs**

A variety of health and safety programs has been implemented in hospitals. However, some real conditions may inhibit staff's intentions to access the health service or participate in health programs. Some experts shared their perceptions regarding this:

Some nurses have to take care of the family [so] there is no way to participate [in the health promotion activities]. We all know that health care workers are so busy. Their time is not sufficient [for their work], without mentioning health promotion. In addition, some people would rather spend time on other things. It depends on personal interests. (Chief of health promotion department)

Our hospitals have psychological counselling hotline that employees can call for help. However, it may be a bit difficult and strange to talk to a stranger about the psychological problems. Although this service is always available, health care workers have to take the initiative to call this number. Otherwise, it is hard for the hospital to help or know the problem. (Chief of OHS department #2)

There is a psychological counselling service in hospital, but health care workers may not recognise their mental problems to use this service. (Occupational disease physician)

Providing health services for staff who are already professionals in health may challenge hospitals. Although an appreciation of current health promotion emerged from the data, some participating staff expressed concerns that hinder their intentions to participate, including lack of time and individual interests:

The problem is we don't have time to be there. Like me, I have to work until 5.30, then I go home to sleep. Sometimes I am so tired at work, so there are even fewer opportunities to go there to exercise. (Head nurse in ED #3)

I go through there [the gym] every day, but I never go in. I will finish my shift at 21.00 today and will come back to work tomorrow morning. How can I have time to

do it? And the excursion activities all run on weekends that are the busiest time in emergency department. How can I let my members join the activities? Emergency department is different to others. (Chief of ED # 3)

I know there is a swimming pool in hospital, but not everyone can swim. It is better to have other options. (Head nurse in ED #2)

Low participation may be an anticipated difficulty in implementing health promotion programs for HCWs, given that the major barriers affecting a better health plan among participating staff were lack of time and lack of energy (56 and 38%, respectively) (see Table 8.2). These data provide an important basis for further program design and implementation in order to achieve optimal health improvement among HCWs.

**Table 8. 2 Frequency distribution of common barriers to employing health plans (N = 323, multiple choice)**

<b>Issues</b>	<b>n</b>	<b>%</b>
<b>Not enough time.</b>	181	56.0
<b>Not enough energy.</b>	123	38.1
<b>Not enough money.</b>	73	22.6
<b>Problem is not serious; there is no rush</b>	62	19.2
<b>Not sure I can really make a difference</b>	59	18.3

Concerning the barriers and challenges to successful OHS management in hospitals, more concerns emerged about the effects of having insufficient personnel with specific responsibility and qualifications to undertake the work:

The nature of psychological counselling service should be different to the public because the object is its own employees. The hospital may have a difficulty to cultivate this kind of professionals to provide counselling service for health care workers. (Occupational disease physician)

Since 2011, the new Act clearly requires the hospital to hire fulltime occupational health nurses. And these nurses are not allowed to perform any clinical practice (to care for patients). They are only responsible for occupational diseases prevention

and health management in hospitals. In fact, many hospitals do not have these personnel. (Occupational disease physician)

In my case, I take the responsibility for labour safety, but also other tasks, like environmental protection, emergency response and fire fighting. Sometimes I cannot concentrate only on the labour safety. In addition, the new Act requires occupational health nurses, but our hospital is not yet able to follow. Actually, I am not the professional occupational staff, so it is very difficult for me to do health tracking. (Chief of OHS department #2)

There were a variety of health and safety programs for HCWs in hospitals. This study found that the main purposes of these programs were similar under different departments. This means that the management and response to the problems of OHS among HCWs are incomplete and inefficient. One hospital executive commented:

This [ineffective report system] is because current policy is governed by different authorities. The cases of labour safety have to be reported to the Council of Labor Affairs. So needlestick injuries definitely are reported to the Council of Labor Affairs. However, the unit of infection control also takes the responsibility to manage the case of needlesticks, and then we have to report to the Department of Health for medical quality control as well. As you can see, there are two different departments and authorities in charge. If they can be integrated, it will be a great help to improve and monitor occupational health and safety. (Hospital executive)

These data indicate that the current role and function of OHS management in hospitals is limited due to the lack of departmental cooperation to integrate the programs. This finding may correspond to the general dissatisfaction with the function and outcome of the incident reporting system among HCWs, which was noted in the previous section.

#### ***8.4 Importance of integrating various sources of data to identify workplace issues***

It may be worth recognising that the main purpose of WHP is to address occupational health by reducing the gap between the real and desired workplace conditions. In this regard, a comprehensive needs assessment is a core part of WHP approaches because it provides a broader range of information about a workplace (see Chapter 4). To define the specific issues



related to workplace health and safety in EDs, and to investigate the causations and possible solutions, it is essential to integrate various sources of data in different types of needs assessment. For example, information from both the interviews and focus group discussions shows an acknowledgement of the incident reporting system. However, interestingly, the survey data show that less than half of participating HCWs tended to comply with the reporting procedure after an incident. With respect to poor incident reporting, HCWs stated that an inconvenient reporting procedure and poor response to a report compromised their intentions to comply with the reporting procedure.

In addition, some experts expressed the difficulties in providing sufficient personnel with specific responsibilities and qualifications to manage and respond to the problems of OHS among HCWs. For effective development of workplace health and safety management, it is important to integrate the interests of the relevant stakeholders and consider the specific workplace issues comprehensively.

## ***8.5 Conclusion***

Aside from the good intentions of OHS management to prevent hazard exposure and promote occupational health for HCWs, the respondents highlighted some defects that compromised the effectiveness of OHS management in hospitals. This study found that a variety of programs—such as health surveillance, stress relief and healthy lifestyles—had been designed to improve and maintain the physical and psychological health of employees in hospitals. However, little attention had been paid to the specific needs of ED HCWs in minimising the risk of hazard exposure in the workplace. Regarding an incident report system, poor solutions and responses to the reports had led to low compliance with the reporting procedure among emergency HCWs, and questions regarding the successful functioning of the incident report system.

Some barriers and challenges to OHS program design and implementation caused significant concerns about achieving optimal outcomes of workplace risk reduction and staff health improvement. This study found that the nature of the work and specific demands in EDs not only increase the difficulties of risk control in workplaces, but also affect compliance with safety practice among emergency staff, which compromises the optimal outcomes of OHS

management. The restraints on funding and resources from the NHI and lack of a strong policy affect hospital executives' motivations in implementing greater efforts towards hazard prevention and health promotion, and in creating a culture of safety in the workplace for HCWs.

Such empirical findings are considered beneficial for a comprehensive understanding of OHS among HCWs in Taiwanese EDs because they provide evidence to identify significant workplace issues, and guide further effective strategy development. The results of the needs assessment intersect and correlate with the other data to create a more concrete and complete picture of workplace needs. The further comprehensive identification of issues related to workplace health and safety in EDs, as well as recommendations for developing practical strategies to overcome these issues, will be presented in the next chapter.

## **Chapter 9 Applying Integrative WHP to Address OHS among HCWs in EDs**

### ***9.1 Introduction***

This study seeks to apply the model of WHP to address the problems of OHS among emergency HCWs in Taiwan. In this model, a comprehensive needs assessment is used to investigate the specific workplace issues related to health and safety of HCWs, and to analyse the risk determinants. The results in Chapters 6, 7 and 8 show that various workplace issues affect the OHS of HCWs in EDs, and the risk determinants of each issue are multiple and have complex causal relationships.

This chapter further identifies the potential strengths and challenges in addressing workplace health and safety in Taiwanese EDs through a strengths, weaknesses, opportunities and threats (SWOT) analysis. Moreover, it identifies the major workplace issues related to health and safety via an integrative analysis of various sources of information, and discusses the main findings of this study and the existing literature. Importantly, this chapter assesses the applicability of an integrative approach of WHP to address the issues of workplace health and safety. Finally, it also makes recommendations for future directions to improve workplace health and safety for ED HCWs in Taiwanese hospitals. The limitations and new contributions of this study are also discussed.

### ***9.2 SWOT analysis for workplace health and safety in Taiwanese EDs***

As the results in this study show, there are a complex variety of issues related to workplace health and safety in Taiwanese EDs. To facilitate developing feasible strategies to enhance the outcomes of effective risk reduction and health improvement for HCWs, this section adopts a SWOT analysis. This analysis reiterates several important and objective conditions in the contemporary health care environment, and the existing efforts and potential to address ED workplace health and safety in the Taiwanese context, based on the data analysis presented in previous chapters.

### **9.2.1 Strengths**

The existing efforts to manage OHS for HCWs in Taiwan have some strengths that may be of benefit for further development of health promotion and risk reduction programs:

1. The national EPINet surveillance system collects relevant data about the prevalence and risk factors of PCIs among clinical staff (Shiao et al., 2008). The surveillance outcomes of sharps/needlestick injuries among HCWs were frequently considered to be much better than other hazard exposures (Chapter 8).
2. Programs of health management, such as influenza vaccination, psychological consultation, weight control and smoking cessation, have been implemented in hospitals (Chapter 8).

### **9.2.2 Weaknesses**

There are some significant weaknesses regarding the existing efforts to address workplace health and safety in Taiwanese hospitals, including:

1. Although the rights and general health of health care practitioners have been protected by the Taiwanese legislation of OHS (IOSH Taiwan, 2010), there has never been a requirement to report workplace incidents to the appropriate authority, unless the incident causes a death or an injury to more than three workers (Chu et al., 2010). This leads to the common phenomenon of underreporting occupational hazard exposures by individual HCWs in hospitals.
2. Hospital managers endeavour to meet patients' needs, but ignore the rights and welfare of HCWs (Chapters 6, 7 and 8).
3. Health and safety programs have been dominated by hospital management and often exclude HCWs from the process of decision making. This means that the opinions and specific workplace needs of HCWs may not be considered appropriately (Chapters 6, 7 and 8).
4. Hospitals are facing difficulties employing qualified and responsible personnel to design and manage the relevant health and safety programs for HCWs (Chapter 8).
5. Some health and safety programs with similar purposes are not integrated. This situation causes the management and response of problems of OHS among HCWs to be incomplete and inefficient (Chapter 8).

### **9.2.3 Opportunities**

There are several opportunities that facilitate further development and implementation of WHP programs to meet the specific needs of risk reduction and health improvement for HCWs in EDs:

1. The HCWs and experts interviewed commonly expressed awareness of the risk of hazard exposure in ED workplaces. This implies an expectation that effective workplace interventions to address these problems will be developed (Chapters 6, 7 and 8).
2. The unique role and function of the ED has been noted by the hospital management, especially in regard to the specific workplace needs of HCWs (Chapter 8).
3. Following the initiative of health promotion that has been undertaken by the Bureau of Health Promotion in Taiwan, programs related to improving healthy lifestyles and behaviours have become popular in hospitals (Chapter 8).
4. HCWs in EDs expressed high interest in participating in workplace programs related to health and safety improvement (Chapters 6 and 8).

### **9.2.4 Threats**

To develop effective programs to address the problems of OHS among HCWs, certain threats should be taken into account:

1. Restricted funding and resources from the NHI have negatively influenced hospital executives' motivations to invest more in creating a safe and comfortable working environment for health care practitioners, even if the hospital executive has the intention to do so (Chapter 8).
2. The nature of work and demands of the job have made the workplace environment and conditions in EDs difficult to control. This increases threats of hazard exposure to HCWs in the process of care provision (Chapters 6, 7 and 8).
3. The effects of long-term staff shortage and high turnover in EDs exacerbate workloads, detract from teamwork efficiency and increase occupational risks in EDs (Chapters 6 and 7).
4. Some members of the public have unreasonable expectations and requirements regarding emergency care services, which affects the relationships between HCWs and patients, and challenges the physical and psychological tolerance of HCWs (Chapter 7).

### ***9.3 The major workplace issues: identification and discussion***

Due to different sources of data, the main findings of each needs assessment are slightly different. Nevertheless, these findings complement each other and create a more objective and concrete picture of OHS among emergency HCWs in Taiwan. In this study, a total of 14 major issues associated with workplace health and safety in EDs were identified after an integrative analysis of the various sources of information. To enable a better understanding and discussion, these identified issues are categorised according to four aspects: (i) common occupational exposures in ED workplaces, (ii) health-related behaviours, (iii) conflicts of job demands and (iv) health and safety programs. Table 9.1 lists all the identified workplace issues and their sources of information according different categories.

**Table 9. 1 Workplace issues and sources of information by categories**

Categories	Workplace Issues	Sources of information <sup>1</sup>						
		A	B	C	D	E	F	G
I.) Common occupational exposures in ED workplaces	▪ Percutaneous injuries	*	*	*	*	*	*	*
	▪ Respiratory transmissible diseases	*	*	*	*	*	*	*
	▪ Musculoskeletal disorders	*	*	*	*	*	*	*
	▪ Mental health-related problems	*	*	*	*	*	*	*
	▪ Workplace violence from patients or their family members	*	*	*	*	*	*	*
II.) Health-related behaviors	▪ Smoking	*	*	*			*	
	▪ Alcohol consumption	*	*	*				*
III.) Conflicts of job demands	▪ Worries about medical malpractice and disputes			*	*	*	*	
	▪ Heavy workloads resulting from ED overcrowding	*	*	*	*	*	*	*
	▪ Effects of staff shortage			*	*	*	*	*
IV.) Health and safety programs	▪ Inadequate consideration of the specific needs of HCWs in designing workplace health and safety programs			*	*	*	*	*
	▪ Poor utilization of health protection and management programs provided for staff						*	*
	▪ Insufficient organizational support to create a healthy workplace			*	*	*	*	
	▪ Low compliance with the incident reporting procedures	*	*	*	*	*	*	*

I: Sources of information:

A: Secondary data reviews

C: Questionnaire survey

E: Focus group discussions

G: International studies reviews

B: Workplace observations

D: In-depth interviews with key HCWs in EDs

F: In-depth interviews with experts

### **9.3.1 Common occupational injuries and diseases in ED workplaces**

Biological hazards—either blood/bodily fluid pathogens or airborne pathogens—encountered during the process of care delivery are common concerns regarding occupational exposures in ED workplaces. In this study, open wounds (including needlesticks, sharps or cutting wounds) accounted for two thirds of participating HCWs who reported work-related injuries or diseases ( $n = 103/173$ ). It is important here to refer to a national study undertaken in Taiwan. Shiao et al. (2008) published a paper in which they estimated that the annual frequency of pathogen-specific PCIs was 1,168 for Hepatitis B, 1,263 for Hepatitis C and 59 for HIV among HCWs in Taiwan. Their results may suggest that the prevalence of PCIs among the HCWs in the current study entailed significant risks of exposing the HCWs to viral hepatitis and HIV.

Alongside blood/bodily fluid pathogens, potential exposure to airborne transmission diseases, such as pandemic influenza, TB and SARS, increases concerns associated with occupational health among HCWs. This result may be explained by the experiences of the large-scale hospital outbreak of SARS, including the fear of life threat, stigmatisation, concern for family safety, and dilemma of balancing personal risk and duty of care (Nickell et al., 2004; Straus et al., 2004). Although a variety of workplace interventions, such as vaccination programs and safety device provision, have been implemented in hospitals to protect HCWs from risk, the evidence from this study suggests that biological hazards remain an issue affecting workplace health and safety in EDs.

MSDs also persist as a major concern of occupational injuries in EDs. In this study, MSDs were ranked second in frequency of occupational incidents among participating HCWs who reported work-related injuries or diseases (55%;  $n = 95/173$ ). This result seems to be consistent with a previous study in Taiwan that identified MSDs as one of the top three potential hazards in the health care service industry (IOSH Taiwan, 2010). The prevalence of MSDs may be explained by the fact that the nature of work in EDs leads to high job strain, including both psychological and physical demands, which aligns with the major determinants of MSDs (Courvoisier et al., 2011; Reme et al., 2012).



In addition to work characteristics, being overweight/obese is considered a crucial factor in developing or exacerbating the symptoms of MSDs (Shiri et al., 2010). This raises a concern about the potential exposure of HCWs to MSDs since one fifth of the participants in this study were overweight. The prevalence of MSDs in selected EDs may be an underestimation, given that a lack of clear diagnostic criteria for chronic MSDs has increased the difficulty in completing compensation claims and incident reports among HCWs. The results of this study not only indicate the importance of policymaking to facilitate MSDs reports, but also highlight the need to improve interventions to address workplace and individual factors.

Regarding the risk of occupational injury, the influence of unsafe behaviour among individual workers cannot be ignored. In this study, some of the experts believed that the majority of work-related injuries were more likely attributed to poor compliance with standard precautions. Corroborating this, the participants in the focus groups acknowledged that they assessed the risk of a situation according to their own experiences and the work demands, rather than complying with the standard procedures. This finding supports previous studies (Doebbeling et al., 2003; Shiao et al., 2008) that indicated that relying on individual risk perceptions and behaviours increases the possibility of work-related injuries. In practice, it is challenging to eliminate individual factors from influencing the probability of hazard exposure. Nevertheless, individual capability should be the last resort for risk preventive measures. As the discussion in Chapter 2 indicated, if individual behaviour directly causes an injury, then organisational and environmental factors can be identified as contributors to forming that behaviour and enhancing the exposure of risk (see Figure 2.2). In this regard, strategies for hazard elimination and substitution, as well as administrative control, should be addressed in advance, rather than attempting to improve individual factors to reduce the level of risk exposure (Mayhew & Peterson, 2005, p. 137).

Mental health-related problems were another issue related to OHS among emergency HCWs. One unanticipated finding was that 13% of the total participating HCWs ( $n =$

42/326) reported mental health–related problems, such as excessive stress, anxiety and depression, as an occupational disease. Interestingly, no record of reported mental illnesses among workers of human health and social work services was found in the statistics released by the government authority (Bureau of Labor Insurance, Taiwan, 2012). There are several possible explanations for this. First, mental illnesses have only been considered occupational illnesses in Taiwan since 2010; thus, this knowledge might not have been widespread among workers of human health and social work services during 2010 and 2011. As a result, no cases of mental illness were reported to the Taiwan Bureau of Labor Insurance during these two years. Second, there is a common phenomenon of underreported occupational exposure in hospital workplaces (Chapman et al., 2010; Kessler et al., 2011). Third, this discrepancy might be caused by a lack of confirmation through medical diagnosis, since this is self-reported data.

Nevertheless, this study draws attention to work-related mental health–related problems. It is important to note that psychological complaints are very personal experiences—especially levels of stress. Although the symptomatic manifestations may not meet the diagnostic criteria of mental health disorders, these psychological distresses are more related to self-perceptions of poor health (Schreuder et al., 2012), as well as being significant predictors of intentions to leave the profession among HCWs (Laposa et al., 2003). Hence, it is crucial to place importance on work-related mental health–related problems among ED HCWs in order to improve occupational health status.

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### **9.3.2 Health-related behaviours**

In this study, some health-related behaviours increased concerns about occupational health and work productivity among HCWs in EDs. This result corroborates the findings of a wide-scale study investigating the indicators of poor health and health risk behaviours among hospital staff in Finland (Virtanen et al., 2012). However, this comparison should be interpreted with caution because the study in Finland included professionals from different care units in public hospitals, whereas the current study is focused only on ED HCWs working in hospitals.

Following the initiative of HP, some programs that seek to alter the individual behaviour of employees to address health problems associated with obesity, physical fitness and smoking have become popular in hospitals (Lee, Chen & Chu, 2012). Nevertheless, the results of this study raise a question about the outcome of healthy behaviour development. For example, the main reason compromising HCWs' intention to exercise was that they were 'too tired because of work'. Moreover, alcohol consumption was reported by some respondents. These results may support the ideas of Peterson et al. (2008), who argued that physical exercise and alcohol consumption were affected by job strain. Without properly improving working conditions, such unhealthy behaviours may be difficult to modify, even though HCWs are aware of the need for health improvement. The reasons to address these unhealthy behaviours are significant. In addition to the adverse health consequences of these behaviours on individual workers, the effects of smoking and alcohol consumption may also increase the burden of health cost (Scarborough et al., 2011). The findings of this study have important implications for hospital management to review the effectiveness of current HP programs to deal with the problems of unhealthy behaviours, and improve working conditions to create a healthy workplace for HCWs.

### **9.3.3 Conflicts of job demands**

The concerns about medical malpractice and disputes, effects of staff shortage and heavy workloads resulting from ED overcrowding identified in this study can be considered

conflicts of job demands that affect the OHS of HCWs. Medical malpractice and disputes can affect the OHS of HCWs in EDs. The results of this study indicate that a fear of medical litigation was considered a source of job stress that resulted in serious understaffing of physicians in EDs. A possible explanation for this might be that emergency physicians were the primary defendants in medical malpractice claims resulting from errors in diagnosis or improper performance of a medical procedure (Brown et al., 2010). Moreover, the nature of the work environment and conditions in EDs are rife with distractions, urgent situations and excessive workloads, which increase the likelihood of medical errors (Pham et al., 2011).

In this study, the factor of communication problems frequently led to discrepancy in understanding the outcomes of emergency care. This result may link to previous research that indicated that the characteristics of ED work pose great challenges to the physician–patient relationship because of ineffective communication (Rhodes et al., 2004). The correlations between workplace characteristics and medical malpractice or disputes are obvious. Nevertheless, the profound influences on stress levels, job perceptions and staff retention in EDs, reflecting the worries of medical litigation that appeared in this study, have not been well described in the literature. Further research with more focus on the effects of medical malpractice or disputes on workplace health and safety among this particular group is required.

In terms of workplace environment and conditions in EDs, the effects on HCWs of inadequate staffing levels cannot be ignored. This study found that there were influences of long-term staff shortage and high turnover in ED workplaces on teamwork efficiency, as well as physical and psychological burdens on HCWs. This situation may worsen because nearly one fifth of participating HCWs expressed the intention to change jobs as a priority for their personal health improvement. Emergency workers' occupational health status and willingness to contribute to the profession in EDs is predicted to decline if recruiting and retaining qualified HCWs in hospitals becomes difficult. The results of this study support the expectations and needs of HCWs for a better work environment and profession, as concluded by DeCola and Riggins (2010). To effectively reduce

occupational incidents and improve health, organisational efforts for workplace safety should address problems of understaffing (Clarke, Sloane et al., 2002). Otherwise, a negative cycle of staffing problems and an unsatisfactory workplace will be perpetuated.

In addition to staff shortage, this study found that heavy workloads can result from excessive non-urgent visits and prolonged stay of admitted patients in EDs. These findings agree with a previous study that explored the factors associated with ED overcrowding in Canada (Bond et al., 2007). Some solutions of ED overcrowding have been suggested to enable efficient operation, including ambulance diversion (McConnell et al., 2005), increased patient education about the conditions appropriate for care in EDs (Redstone et al., 2008), increased bed access (Forero et al., 2010) and an observation unit to reduce the number of patients awaiting admission to a hospital bed (Moloney et al., 2006). Nevertheless, this study found numerous complaints about ED service abuse due to the common misunderstanding that EDs are convenient care units to seek medical assistance, as well as a lack of effective bed management and patient discharge plans. Such information strongly points to the need to improve the public's knowledge about the function and purpose of ED service, and develop effective strategies to transfer non-urgent patients to outpatient clinics in order to ensure reasonable workloads for the staff in EDs.

#### **9.3.4 Health and safety programs**

Inadequate consideration of specific needs when designing workplace health and safety programs is a significant issue affecting the anticipated outcomes of health promotion and risk reduction for HCWs in EDs. For example, there is acknowledgement of a variety of workplace programs that aim at health improvement and risk reduction for HCWs in hospitals. However, the results of this study show that 'a lack of sufficient time' and being 'too tired because of the work' inhibited HCWs' participation in these programs. An explanation for this discrepancy might be that the majority of health and safety programs have been designed on an organisational basis; thus, the specific needs of different groups of workers have not been taken into account (Huang et al., 2010).

Regarding the effectiveness of workplace health and safety programs, advanced health services to minimise exposure to occupational hazards and improve occupational health status for HCWs are poorly used by these workers. There are common health surveillance programs required by Taiwan's OHS Act, and additional health services—such as Hepatitis B and influenza vaccinations, and a psychological counselling hotline—that are usually voluntary and free for hospital employees. However, some experts were aware that few HCWs actually access these services. Possible explanations for this include personal misconceptions about the side effects of vaccines and doubts about vaccine efficacy (Piccirillo & Gaeta, 2006); poor perceptions of occupational risk (Nickell et al., 2004); and that the quality of service provisions does not meet the expectations of HCWs (Clements et al., 2005), which inhibits their intention to access these health services. The poor use of health protection and management programs may compromise the efforts of early prevention and early treatment of occupational exposure for HCWs. Thus, further attempts should be made to promote the advantages of these services to the professional staff in EDs.

In the current Taiwanese health care environment, a competitive atmosphere striving for advanced and quality care service for patients and the public has grown in Taiwanese hospitals. This competitiveness increases job stress and workloads on the practitioners who provide care. However, limited funding and resources have led to ambiguous attitudes among hospital executives in endeavouring to prevent workplace hazards and promote health for their HCWs (Lin & Lin, 2011). The results of this study indicate that efforts to develop specific programs targeting the priority needs of OHS improvement among HCWs in EDs are insufficient because hospitals do only as much as required to retain accreditation or meet the legal requirements of the OHS Act. A typical example in this study is that, although programs about WPV from patients or clients have been held in hospitals, their effectiveness and practicality in terms of enhancing individuals' risk perception and protective skills, policymaking and environmental modifications are limited. This finding also highlights the importance of developing integrative approaches to address the specific OHS needs of ED HCWs.

Insufficient support from hospital management was also found to have profound effects on workplace safety culture. The results of this study clearly reveal that the concept of ‘culture of safety’ in hospital settings currently focuses on patient safety, rather than staff safety. In terms of OHS, perceptions of risk, compliance with safety standards and prevalence of exposure among HCWs are more likely to reflect the organisational safety climate (Myers et al., 2012; Schoenfisch et al., 2011; Spector et al., 2007). In this regard, it is essential for hospital management to make greater efforts and pay greater attention to creating a safety culture that equally addresses the health and wellbeing of patients and HCWs.

In this study, less than half of HCWs had complied with incident reporting procedures after an incident. This study produced results regarding current incident reporting system in hospitals which corroborate the findings of a great deal of the previous work in this field. As found in the literature, there is a common phenomenon of underreporting (Chapman et al., 2010; Ko et al., 2011) and a misconception that hazard exposure is simply part of the work (Chapman et al., 2010). In addition, dissatisfaction with the management of reports is identified as a barrier to reporting workplace accidents (Azadi et al., 2011). These factors lead to concerns about the effectiveness of OHS management in hospitals, and underestimation of the prevalence of work-related injuries and diseases among HCWs.

Another important finding was that participating HCWs questioned the function of the incident reporting system because of poor solutions or no action taken to deal with the problems. However, the results of the normative needs assessment indicated that some of the selected hospitals were facing difficulty in recruiting and training responsible professionals to respond to the incident reports and manage the relevant health services. This situation has affected HCWs’ perceptions of organisational risk management and support, as well as their intentions to comply with the reporting procedure. These findings have important implications for enhancing the function and operation of the incident reporting system to approach the problems of OHS in hospitals.



#### ***9.4 Risk determinants analysis and integrative strategy development for selected workplace issues of health and safety***

By applying the model of WHP to address the problems of OHS among emergency HCWs in Taiwan, this section selects some identified workplace issues to facilitate further risk determinant analysis and suggest possible solutions. By considering the most common concerns for occupational exposure in ED workplaces, as well as the organisational aspects of monitoring and reducing the risks of exposure to hazards, three issues were selected:

- WPV from patients or their family members (see Table 9.2)
- low compliance with incident reporting procedures (see Table 9.3)
- heavy workloads resulting from ED overcrowding (see Table 9.4).

Following the categories of workplace health determinants indicated in two WHO documents (WHO, 2010b; WHO-WPRO, 1999), this section analyses the relevant risk determinants in terms of structure, environment, individuals, culture and health services. Further, some indicative solutions are suggested for an integrative approach in accordance with the five essential strategies advocated by the Ottawa Charter: building healthy policy, creating supportive environments, developing personal skills, strengthening community actions and reorienting health services.

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**Table 9. 2 Determinant analysis and strategy suggestion of low compliance with the incident reporting procedures**

<i><b>Issue: Low compliance with the incident reporting procedures</b></i>			
<b>Determinant analysis</b>		<b>Strategy suggestion</b>	
<b>Structure</b>	<p><b>1)</b> The procedure of incident report is complicated and time consuming.</p> <p><b>2)</b> Incident reporting is not mandatory.</p> <p><b>3)</b> Current incident report system does not cover all occupational hazards (e.g. stress).</p> <p><b>4)</b> There is no clear instruction about incident report procedure in EDs.</p> <p><b>5)</b> HCWs are too busy to report the event.</p>	<p><b>1.1)</b> Establish a convenient and quick reporting procedure.</p> <p><b>2.1)</b> Develop a reward measure to encourage reporting of any type of incident.</p> <p><b>3.1)</b> Make clear definitions and criteria of occupational exposures in hospitals.</p> <p><b>3.2)</b> Revise and update the items of occupational hazard in the reporting system.</p> <p><b>4.1)</b> Make the information about the report procedure easy to find in EDs.</p> <p><b>5.1)</b> Give the shift leader the responsibility to assist HCWs reporting the event.</p> <p><b>5.2)</b> Allow the exposed staff to take necessary actions immediately to facilitate incident report.</p> <p><b>5.3)</b> Develop a program to recruit and retain qualified staff working in EDs.</p>	<b>Build healthy policy</b>
<b>Environment</b>	-	-	<b>Create supportive environments</b>

<i><b>Issue: Low compliance with the incident reporting procedures</b></i>			
<b>Determinant analysis</b>		<b>Strategy suggestion</b>	
<b>Individual</b>	<b>1)</b> Certain hazard exposures are accepted among HCWs, which reduces the intention of reporting.	<b>1.1)</b> Provide educational programs to enhance HCWs' perceptions and awareness about hazard exposures.	<b>Develop personal skills</b>
<b>Culture</b>	<b>1)</b> There is a common belief that nothing will change after reporting.  <b>2)</b> The workplace climate assumes that accidents often result from personal negligence.	<b>1.1)</b> Provide a specific improvement plan to solve the problems that caused an incident.  <b>1.2)</b> Involve HCWs in the process of program development.  <b>2.1)</b> Create a workplace climate in which staff can gain appropriate support after an exposure.	<b>Strengthen community actions</b>
<b>Health service</b>	<b>1)</b> Current post-exposure management is unsatisfactory.	<b>1.1)</b> Appoint responsible and qualified personnel to respond to reports and follow up the exposed staff's health condition.	<b>Reorient health services</b>

**Table 9. 3 Determinant analysis and strategy suggestion of heavy workloads resulting from ED overcrowding**

<i><b>Issue: Heavy workloads resulting from ED overcrowding</b></i>			
<b>Determinant analysis</b>		<b>Strategy suggestion</b>	
<b>Structure</b>	<p><b>1)</b> The Taiwan National Health Insurance allows people to have free choice and unlimited access to ED care service.</p> <p><b>2)</b> The available ward beds are insufficient for patients waiting for admission in EDs.</p> <p><b>3)</b> Because of insufficient staffing levels, ED HCWs are too busy to help each other.</p>	<p><b>1.1)</b> Strengthen the teamwork cooperation for effective care provision.</p> <p><b>1.2)</b> Set up an additional unit to care for patients with nonurgent health needs.</p> <p><b>1.3)</b> Increase the ED registration fee to impede nonurgent visits to the EDs.</p> <p><b>2.1)</b> Accelerate the release of beds in the wards to decrease patients' waiting time in EDs.</p> <p><b>2.2)</b> Set up an appropriate referral system for patients with admission needs.</p> <p><b>3.1)</b> Develop a program to recruit and retain qualified staff working in EDs.</p> <p><b>3.2)</b> Assign extra staff to work in the busy time.</p>	<b>Build healthy policy</b>
<b>Environment</b>	-	-	<b>Create supportive environments</b>
<b>Individual</b>	<b>1)</b> Some HCWs have poor professional capability to complete the task.	<b>1.1)</b> Provide routine continuing in-service education programs to enhance HCWs' professional knowledge and skills to provide care for patients.	<b>Develop personal skills</b>
<b>Culture</b>	<b>1)</b> There is a common belief that ED service is convenient and prompt for everyone.	<b>1.1)</b> Promote the main function of ED service in the community.	<b>Strengthen community actions</b>

<i><b>Issue: Heavy workloads resulting from ED overcrowding</b></i>			
<b>Determinant analysis</b>		<b>Strategy suggestion</b>	
	<b>2)</b> A phenomenon of "hospital shopping" exists.	<b>2.1)</b> Encourage the public to cherish their hospital services by not misusing them.	
<b>Health service</b>	<b>1)</b> Seeking health service is the basic human right, EDs cannot refuse patients.	<b>1.1)</b> Adhere to the ED triage scales strictly, and give priority for health care provision according to the standards of treatment time.  <b>1.2)</b> Reinforce the quality of care service in outpatient departments to reduce number of visits.	<b>Reorient health services</b>



These three examples demonstrate a systematic determinants analysis and integrative strategy development to address workplace issues related to the health and safety of emergency HCWs. Although this study did not apply the whole model of WHP to the ED setting, the specific issues of OHS and possible solutions of an integrative approach, which are the crucial steps in the WHP model, are addressed. The results of this study provide evidence to assist hospital managers, policymakers and experts to develop and implement future WHP programs to enhance the OHS of HCWs in EDs. Further, this study suggests that future application of the complete model of WHP to promote OHS for all health care practitioners in hospitals is feasible.

### ***9.5 Significance and limitations of the study***

Comparing the findings of this study with previous studies highlights some significant contributions of this study to existing knowledge and practice in terms of the problems of occupational exposure and program development to address workplace health and safety in Taiwanese hospitals:

- This study provides a comprehensive understanding of the specific needs of workplace health and safety among ED HCWs in Taiwan, which has not been explored in previous studies.
- This study indicates that complex workplace issues can be systematically analysed and identified through a comprehensive needs assessment in the model of WHP, which assists further decision making and program development to promote the OHS of ED HCWs in Taiwan.
- This study demonstrates an integrative strategy that considers that building healthy policy, creating a supportive environment, developing personal skills, strengthening community action and reorienting health services can be feasible solutions to address the multiple determinants of workplace issues in Taiwanese EDs.
- This study suggests that applying the model of WHP to address the problems of OHS in Taiwanese EDs is feasible. It may also be applied to other care units or the entire hospital setting in Taiwan and other countries.

Nevertheless, the findings in this study are subject to at least three limitations:

- This study was limited by adopting a cross-sectional design to investigate the overall picture of the phenomenon; thus, causal relationships between occupational exposures and workplace risk factors among emergency HCWs could not be established statistically.
- The needs of workplace health and safety identified in this study were limited to ED HCWs working in nine Taiwanese hospitals. Although the data provide insights into the needs for occupational health improvement and risk reduction for HCWs in EDs, it may not be transferable to all workplaces in hospitals.
- This study explored the problems of workplace health and safety in EDs through a triangulation methodology to collect data for a comprehensive needs assessment. However, it was unable to access the complete records for the health and safety of HCWs, such as the use of recreational facilities or occurrences of workplace injury and absenteeism, in each sampled hospital. The hospital executives were reluctant to provide such data because of consideration of the hospitals' confidentiality. Hence, the self-reported data of health status in this study should be interpreted with caution.

### ***9.6 Recommendations of the study***

Based on the research findings in the previous chapters and the discussion above, this study provides the following recommendations to address the key barriers to supporting and developing effective interventions for OHS in Taiwan EDs. The recommendations are categorised into three aspects: government and relevant professional associations in policy and system development, health and safety program implementation in hospitals, and further research.

### **9.6.1 Recommendations for policy and system development in the sectors of government and relevant professional associations**

In view of the current difficulties and challenges in addressing the problems of workplace health and safety in Taiwan EDs, some efforts from the various levels of government in terms of policymaking and system development are essential:

- Health accreditation is a system to guide and monitor the directions of operation and development in hospitals. The requirements made in the standards of health accreditation have a powerful influence on hospitals' policies and interventions. Hence, it is suggested that the accreditation requirements should emphasise the role of OHS in preventing occupational health problems for HCWs according to the specific conditions of each hospital. This may lead hospital management to pay more attention to the workplace needs of clinical staff.
- Besides the nature of the working conditions in EDs, overcrowding has had significant effects on the OHS of HCWs. The phenomenon of ED overcrowding is greatly attributed to the fact that the NHI system entitles people to access health care service with only minimal personal expenditure. Further, the payment program in the NHI system tempts hospitals to pursue greater economic benefits through care provision for as many patients as possible. This leads hospitals to take in more patients than they can care for properly. In this regard, the Bureau of NHI has a responsibility to improve the concept of medical service use among the public. In addition, developing a reasonable payment program may ensure that the quality of care provision can be delivered to patients, and that hospitals can gain a proper profit for sustainable development and operation, including, importantly, creating a healthy and safe workplace for their employees.
- In terms of national OHS surveillance among HCWs, the EPINet system to collect data of needlestick/sharps injuries has been successful. This system could be extended to involve other occupational hazards, especially WPV and MSDs. Further, collaborating with the Taiwan Council of Labor Affairs to reinforce the national reporting system and database of the OHS of HCWs would provide evidence-based information that would facilitate making effective strategies and policies for safe practice and health improvement in health care institutions.

- Health professional associations should represent their members by claiming the basic rights of OHS, and promoting relevant policies through intervention with public authorities to decrease the incidents of ED violence from patients or visitors, and uphold workload rationalisation for ED HCWs.
- The relevant government departments and health professional associations should provide appropriate assistance to develop special projects or research to address workplace improvement in hospitals.
- The Taiwan Council of Labor Affairs and health professional associations, especially those concerned with OHS, should work together to establish clear diagnosis criteria for occupational exposures among HCWs, especially for MSDs and mental health-related problems. This is because some manifestations of work-related injuries or diseases may not emerge immediately after an exposure. In addition, unclear criteria may increase the probability of underreporting and the difficulties for compensation claims.

### **9.6.2 Recommendations for health and safety program implementation in hospitals**

To reinforce current strategy development and implementation related to workplace hazard reduction and health promotion, hospitals should make improvements in the following aspects:

- Effective programs should be developed to recruit and retain qualified HCWs working in EDs to address the problem of heavy workloads.
- The poor use of certain health services provided in hospitals for HCWs—such as influenza vaccinations and psychological counselling—may compromise the efforts of early prevention and early treatment of occupational exposure for HCWs. Hospitals should plan more effective promotion of these services in order to enhance the health and wellbeing of their staff.
- Priority should be given to developing policies and programs that address the specific needs of workplace health and safety in terms of WPV, MSDs and stress management, particularly for workers in EDs.

- Program development must consider integrative approaches to address the various interrelated determinants of health and safety among HCWs.
- Hospitals should appoint a responsible coordinator to integrate similar health and safety programs to avoid dispersing available resources and funding among different departments.
- Multidisciplinary collaboration must be strengthened to gain more support for successful program implementation, and address the best interests for each sector. In addition to HP practitioners and occupational health professionals, hospital administration, HCWs, security personnel and other relevant stakeholders should be involved in the process of program development.
- Education and training programs should be ongoing and mandatory to enhance HCWs' awareness of hazard exposure and practice of adherence to safety standards.
- It is necessary to reinforce the current incident reporting system and post-exposure management by modifying policies and appointing personnel to be responsible for proper follow-up of incidents in hospitals.
- It is important to create a workplace climate that considers staff safety as highly as patient safety.
- All information related to workplace health and safety should be easily accessible by HCWs.

### **9.6.3 Recommendations for further research**

Advanced research plays an important role in workplace health improvement and risk reduction for HCWs in Taiwan. Thus, recommendations for further research are as follows. More research is needed:

- for effective intervention development to address the problems of occupational exposure among ED HCWs in Taiwan
- to evaluate the outcomes of OHS improvement by applying the model of WHP in Taiwanese hospitals

- to investigate the negative effects of medical malpractice and disputes on stress levels, job perception and staff retention among emergency HCWs in Taiwan
- to ascertain the barriers to HCWs using the psychological counselling service provided in hospitals
- to use qualitative methods to reinforce the results of quantitative research in exploring the problems of OHS and providing feasible and sustainable evidence-based solutions
- about the materials and training used to develop risk perception and preventive skills in association with hazard exposure among potential HCWs in pre-service training. The fundamental knowledge and skills gained in school will facilitate the further in-service training provided in hospitals

### ***9.7 Conclusion***

To summarise, this chapter has identified ED workplace issues by integrating the results of a comprehensive needs assessment. All issues were further categorised in terms of common occupational exposures in ED workplaces, health-related behaviours, work environment or conditions, and health and safety programs. For effective risk reduction and health improvement for HCWs in EDs, suggestions of integrative and feasible strategies have been provided to deal with selected workplace issues, including WPV from patients and their family members, low compliance with reporting procedures, and heavy workloads resulting from ED overcrowding.

This chapter has concluded that WHP is feasible and essential to enhance the achievement of OHS for all health care practitioners in hospitals. Although this study's limitations mean that its findings should be interpreted with caution, it makes significant contributions in terms of bridging the gap in current knowledge about workplace concerns and potential strategies to address the health and wellbeing of hospital HCWs around the world. Consequent to the findings and analysis in this study, recommendations have been made regarding policy and system development in the sectors of government

and relevant professional associations, health and safety program implementation in hospitals, and further research.

## **Chapter 10 Conclusion**

This study has investigated the workplace health and safety needs of HCWs, and possible solutions to these needs, in the EDs of Taiwanese hospitals. It has demonstrated that the integrated and comprehensive approaches of the WHP model are feasible to address the complex issues of OHS in Taiwanese EDs. Based on the analysis of the results, this study has highlighted the knowledge and practice gaps in meeting HCWs' specific needs of workplace health and safety in EDs, and offered recommendations for future support and development of effective programs to enhance health improvement and risk reduction for HCWs in Taiwanese EDs.

This thesis consisted of two parts. Following the Introduction, Part 1—a literature review—presented the background of this study and the rationale behind applying the WHP model to promote OHS among ED HCWs in Taiwanese hospitals. This part reviewed the risk factors and consequences of the common occupational exposures among HCWs, as well as the existing workplace interventions to deal with the problems in hospitals. It then narrowed down to examine the issues of workplace health and safety in EDs, and current achievements and barriers to health promotion and risk reduction for ED HCWs in the context of Taiwanese hospitals. Responding to the gaps found in the literature review, this part also attempted to identify effective solutions, particularly the WHP model, to promote workplace health and safety for HCWs in Taiwanese EDs.

In Part 1, Chapter 2 examined the current knowledge about risk factors, consequences and workplace interventions of various occupational exposures among HCWs in hospitals. It indicated that a wide range of biological, chemical, radiation, ergonomic and psychological hazards threaten the health and safety of HCWs during their daily work. The risk of hazard exposure can be attributed to complex interacting determinants, rather than one single risk determinant. The subsequent effects of occupational exposure on both individuals and organisations—including staff health status, job satisfaction, turnover and work performance—are significant. However, current workplace interventions to minimise the risk of exposure in hospitals are inadequate in dealing with



the multiple interrelated determinants. In this regard, this chapter selected needlestick/sharps injury as an example to assess current approaches and gaps in workplace hazard management. An integrative strategy to address occupational health and reduce workplace risk for HCWs was suggested. This chapter also found that, although the risk of hazard exposure in hospitals is common, EDs are frequently considered a risky workplace for HCWs. This implies a significant need for further in-depth exploration of the causations between the specific work characteristics and OHS for the group of HCWs in EDs.

In response to global concerns about the OHS of HCWs in EDs, Chapter 3 examined the issues of workplace health and safety in EDs in the context of Taiwanese hospitals. This chapter pointed out that the nature of work demands and physical environment—such as rapid work pace, threats of unpredictable communicable diseases, overcrowding and uncomfortable atmosphere—have resulted in EDs becoming risky workplaces for hazard exposure in hospitals. Unfortunately, the shortage of data and research increase the difficulty of understanding the widespread prevalence of occupational disease and injury, and the specific needs of protecting and promoting the health of HCWs in Taiwanese EDs. This indicates that investigating the specific issues related to workplace health and safety for this group of workers is required. Along with the job characteristics in EDs, factors relating to the current Taiwanese health care insurance system and the ambiguous attitudes of hospital management also have profound influences on health promotion and risk reduction for HCWs. Hence, a setting-based approach to address these complex workplace features and potential OHS problems in Taiwanese EDs was recommended.

In terms of this effective setting-based approach, Chapter 4 introduced the WHP model to deal with workplace issues related to health and safety in Taiwanese EDs. This chapter explained the rationale for investing in worksite health promotion and an implementation cycle of the programs. In accordance with the eight-step process for developing healthy workplaces suggested by the WHO-WPRO (1999), a comprehensive needs assessment is the core part of the model of WHP. This gathers relevant information from various sources of data to help identify workplace issues and provide fundamental evidence for

further integrative program design and outcome evaluation. Although the experiences of many international cases have suggested that the key to successful WHP is their integrative approach to meet the needs of stakeholders, current worksite HP programs implemented in Taiwanese hospitals seem to be inadequate in responding to the significant needs of workplace health and safety among HCWs. The analysis in Chapter 4 highlighted the importance of effective application of the WHP model in Taiwanese hospitals to achieve greater health and better risk management for HCWs.

Part 2 of this study consisted of Chapters 5 to 9. It explained the rational, conceptual framework and research methodology of this study, as well as the research findings, discussions and recommendations. Chapter 5 first indicated the gaps in current approaches to minimise the risk of occupational exposure among HCWs, as well as the gaps in knowledge about the specific needs for health improvement and risk reduction among HCWs in Taiwanese EDs that should be addressed. In response to this background, this study sought to apply the WHP model to EDs in Taiwanese hospitals to investigate the specific workplace issues related to the health and safety of HCWs, and provide feasible suggestions for an integrative approach to deal with the problems. This chapter then constructed a conceptual framework to illustrate the main course of action in research to address the research topic and specific objectives of this study. The latter part of this chapter explained the details of the research methodology, including both quantitative and qualitative methods for data collection and analysis, as well as the issues of rigor and ethics to achieve the research purpose.

In Part 2, Chapters 6 to 9 presented the findings of the study in terms of the profile of OHS status among ED HCWs and the relevant workplace risk factors, common concerns for occupational hazards in EDs, and challenges of implementing workplace health and safety programs in hospitals. In addition, recommendations for further promotion of workplace health and safety in Taiwanese hospitals were offered.

Chapter 6 provided a brief profile of the OHS status of HCWs in EDs, and identified a number of workplace risk factors affecting staff health and safety. This chapter showed

that, in addition to some health-related behaviours—including smoking and drinking alcohol—the significant determinants of health status among ED HCWs were work-related injuries or diseases. There was high prevalence of self-reported occupational exposures among HCWs in EDs. Exposure to biological hazards, musculoskeletal injuries and mental health-related problems were identified as common. The results highlighted the prevalence of self-reported mental health-related problems, which has not been recorded among the relevant group of workers in the statistics of the government authority. Moreover, an intention to change jobs was commonly considered a priority of health improvement by HCWs. Regarding the relevant risk factors, a variety of workplace factors—particularly organisational aspects—caused OHS concerns for HCWs. Among personal and workplace factors, variables of physical health problems and awkward postures/repetitive motions emerged as reliable predictors of work-related injuries or diseases among HCWs. The findings from workplace observations supported the results of the questionnaire survey, which indicated that the nature and characteristics of the work in EDs may cause great challenges to the physical and psychological tolerance of HCWs. The findings from this chapter suggested that more attention should be paid to the OHS status of HCWs in EDs.

In addition to the experiences of work-related injuries and diseases among HCWs, Chapter 7 further explored the common concerns or worries about the potential risk of occupational exposure in ED workplaces, since such data can be taken as a further indicator of the specific needs of workplace health and safety among HCWs in EDs. One of the more significant findings to emerge was that, among a variety of identified workplace concerns for hazard exposure, issues of WPV from patients or their family members and job stress were the top priority.

**{Following paragraph includes the published paper, “The needs and potential solutions for improvement of workplace violence management in emergency departments in Taiwanese hospitals” have been removed from this copy for copyright reasons.}**

Regarding job stress, workplace issues—including unreasonable expectations from the public, patients' prolonged stays in EDs, and medical malpractice suits and disputes—were common causes of worry, nerves or stress for HCWs. In addition, self-reported mental health-related problems among HCWs had significant associations with certain workplace stressors, including unreasonable expectations, shift work and excessive workloads. The evidence from this study suggested the importance of addressing job stress in improving occupational health among HCWs in EDs. However, current strategies for reducing stress among HCWs in Taiwanese EDs are predominantly worker-focused interventions, rather than organisational interventions to address the sources of stress and provide support for effective stress management by HCWs. The findings in this chapter contribute substantially to understanding the most common concerns about WPV and job stress in Taiwanese EDs, and have important implications for developing integrative strategies to address the multiple determinants of these workplace concerns.

Workplace health and safety management is crucial in promoting health and reducing risk in hospitals. Chapter 8 examined current health and safety programs that are implemented for HCWs, as well as the barriers and challenges to successful health and safety management in hospitals. The evidence from this study suggested that, although there is acknowledgement of current efforts towards health management and promotion targeting HCWs, staff interests in the prevention of occupational exposure are not being properly addressed. An incident report system is essential in monitoring the risk of occupational exposure in hospitals; however, the results of this study indicated that this system has a number of serious drawbacks, including poor solutions and responses to reports, which contribute to low compliance with the procedure among participating HCWs.

In addition to the incident reporting system, other significant barriers and challenges to successful health and safety management in hospitals were identified. The nature of work demands increased the difficulties of risk control in ED workplaces and compliance with safety practice among HCWs. Although a variety of health and safety programs has been implemented, inadequate considerations of the specific conditions and needs of HCWs compromised the staff's intentions to participate in or access relevant programs. Most

importantly, the restrictions on funding resulted in an ambivalent attitude among hospital executives towards creating a healthy workplace, a lack of department cooperation or program integration, and a shortage of qualified personnel to manage the relevant health and safety programs. These issues were significant hindrances to achieving strong OHS management for HCWs. These findings provided evidence-based information to facilitate further development of effective programs to enhance the efficiency of OHS management in hospitals.

The results in Chapters 6, 7 and 8 enhanced understandings of the workplace needs related to OHS among HCWs in Taiwanese EDs. The discussions and recommendations of the study in the final chapter of Part 2, Chapter 9, further demonstrate how an integrative approach can address the specific workplace issues, and provide a number of future directions to address key barriers to improving workplace health and safety for ED HCWs in Taiwan.

Chapter 9 discussed the application of integrative WHP to address the OHS of HCWs in EDs. This chapter began by examining the current strengths and difficulties in creating a healthy and safe workplace in Taiwanese EDs through a SWOT analysis, and integrated the findings in different types of needs assessment for workplace issues identification. It further discussed the main workplace issues identified in this study and the existing literature. All workplace issues identified in this study were categorised for discussion into four aspects: (i) common occupational exposures in ED workplaces, (ii) health-related behaviours, (iii) conflicts of job demands and (iv) health and safety programs.

Regarding the common occupational injuries and diseases in ED workplaces, this study has drawn more attention to the lack of clear diagnostic criteria for work-related MSDs and mental health-related problems for health care practitioners in Taiwan. This lack may create difficulty in compensation claims, and underestimation of the prevalence of exposure to risk among ED HCWs. Individual health-related behaviours found in this study underlined the need to review the efficiency of current HP programs targeted at HCWs, and establish effective control measures for occupational exposure in hospitals.

In addition, many identified issues in this study were related to the nature of the work environment and conditions in EDs, and to problems with the health and safety programs implemented in hospitals. Taken together, the results of these discussions suggest that further efforts should be made towards meeting the specific needs of occupational health promotion and workplace risk reduction for ED HCWs in Taiwan.

This chapter further demonstrated how an integrative approach can deal with the workplace problems in EDs. In order to demonstrate how an integrative approach can be applied to deal with the multiple interacting factors of a workplace issue, rather than each factor in isolation, three identified workplace issues were selected for comprehensive determinant analyses and integrative strategy recommendations. These issues were WPV from patients or their family members, low compliance with incident reporting procedures, and heavy workloads resulting from ED overcrowding. For each workplace issue, feasible strategies were considered in terms of building healthy policy, creating a supportive environment, developing personal skills, strengthening community action, and reorienting health services to address the problems. Although this study did not apply the entire WHP model to the hospital settings, it addressed the specific issues of OHS and integrative strategies for further design of health and safety programs, which are the crucial aspects in the model of WHP. This chapter concluded that WHP is feasible and essential in hospitals to promote the health and safety of ED HCWs in Taiwan.

The final section of Chapter 9 identified the contributions and recommendations of this study. In light of the literature review, the findings of this study make noteworthy contributions to research and practice. Besides bridging the gaps in current knowledge about the specific workplace needs related to the OHS of ED HCWs in Taiwan, this study provides an integrative strategy as a better solution to deal with the multiple interacting determinants of workplace issues related to health and safety. However, some limitations mean that the findings of this study should be interpreted with caution. To address key barriers to supporting and developing effective programs to promote workplace health and safety in Taiwanese hospitals, feasible recommendations were made separately for governments, professional associations, hospitals and research.

In summary, this study provides evidence of a range of specific needs related to OHS improvement for ED HCWs in Taiwan, together with the recommendation that an integrative approach would address the current inadequacies by applying the key aspects of WHP. It is now time for hospital managers, OHS and HP practitioners, and researchers to reinforce their efforts to prevent ill health at work and enhance the potential and wellbeing of health care practitioners by integrating successful programs of WHP.

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## Appendix A Checklists of Workplace Observation

<b>Housekeeping</b>				
<b>Items</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comments</b>
All areas are tidy and items are easily accessible				
Thoroughfares / corridors are clear of obstruction				
Floor surface is intact, dry and clean				
<b>Management of health and safety</b>				
<b>Items</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comments</b>
The workplace has a protocol of workplace health and safety which can be easily approached by staff				
Firefighting appliances				
The loose or frayed cords on electrical devices replaced or repaired				
Emergency escape route displayed				
No smoking signs				
Containers sealed and labeled with names and hazard sign symbols				
Chemicals or poisons properly stored				
Personal protective equipment provided (goggles, gloves, masks, gowns.....)				
Contaminated materials properly labeled and stored				
The general lighting levels are adequate				
A waiting room for patients or their family				
24 hours surveillance system				
<b>Personnel</b>				
<b>Items</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comments</b>
Sufficient security personnel in 24 hours				
HCWs' interactions with patients or colleagues.				

## Appendix B Ethical Clearance Certificate

### HUMAN RESEARCH ETHICS COMMITTEE

# **ETHICAL CLEARANCE** **CERTIFICATE**

This certificate generated on 20-03-2013.

This certificate confirms that protocol 'NR: Investigate the workplace health and safety needs and potential solutions for health care workers in Taiwanese emergency departments.' (GU Protocol Number ENV/12/12/HREC) has ethical clearance from the Griffith University Human Research Ethics Committee (HREC) and has been issued with authorisation to be commenced.

The ethical clearance for this protocol runs from 29-02-2012 to 01-03-2013.

The named members of the research team for this protocol are:

Prof Cordia Chu

Dr David Bromwich

Miss Li-Ya Lin

The research team has been sent correspondence that lists the standard conditions of ethical clearance that apply to Griffith University protocols.

The HREC is established in accordance with the *National Statement on Ethical Conduct on Research Involving Humans*. The operation of this Committee is outlined in the HREC Standard Operating Procedure, which is available from [www.gu.edu.au/or/ethics](http://www.gu.edu.au/or/ethics).

Please do not hesitate to contact me if you have any further queries about this matter.

Rick Williams  
Manager, Research Ethics  
Office for Research  
Bray Centre, N54 Room 0.15 Nathan Campus  
Griffith University  
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## Appendix C Certificate of Approval



### 人體試驗委員會試驗同意書 Certificate of Approval

試驗名稱：探討台灣急診室醫護人員職場健康和安全的需求以及可行性的解決方案  
本會編號：人 10118  
試驗主持人：阮祺文 光田綜合醫院 急診部  
協同主持人：林麗雅  
計畫書版本：KTGH,AF/007-05/04.0 Version 1, Date: 10-Apr-2012  
中文計畫摘要版本：KTGH, AF/007-06/02.0 Version 1, Date: 10-Apr-2012  
英文計畫摘要版本：KTGH, AF/007-07/02.0 Version 1, Date: 12-Mar-2012  
受試者同意書版本：KTGH, AF/017-03/01.0 Version 1, Date: 12-Mar-2012  
計畫有效期限：2013.04.12

期中報告：若計畫需延長執行期間，請於 2013.01.12 前繳交期中報告。

結案報告：若計畫已完成，請於完成日後一週內通知本人體試驗委員會，並盡快繳交期結案報告。

**Protocol Title** : Investigate the workplace health and safety needs and potential solutions for health care workers in taiwanese emergency departments.

**KTGH IRB No.** : 人 10118

**Chief Principal Investigator** : Chi-Wen Juan (Kuang-Tien General Hospital)

**Co Principal Investigator** : Li-Ya Lin

**Protocol No. / Version** : KTGH,AF/007-05/04.0 Version 1, Date: 10-Apr-2012

**Summary of Chinese Plans** : KTGH, AF/007-06/02.0 Version 1, Date: 10-Apr-2012

**Summary of English Plans** : KTGH, AF/007-07/02.0 Version 1, Date: 12-Mar-2012

**Informed Consent Form** : KTGH, AF/017-03/01.0 Version 1, Date: 12-Mar-2012

**Study Approval Expires** : 12- Apr-2013.

【符合本院 SOP 及 GCP 相關規範，試驗主持人有義務於時間內繳交期中報告並於試驗結束後繳交結案報告】  
上述研究計畫有關病患／受檢對象權益的保障、賠償或補償辦法、傷害通報與處理，業已通過本人體試驗委員會評估，同意該研究計畫在時限內進行。計畫執行期間人體試驗委員會將不定期檢查病患／受檢對象接受研究之同意書，確保病患／受檢對象之安全與權益。

光田醫療社團法人

光田綜合醫院

人體試驗委員會

主任委員 陳宗瀛



中華民國 101 年 04 月 13 日

The Institutional Review Board performs its functions according to written operating procedures and complies with GCP and with the applicable regulatory requirements.

Generated by CamScanner

## Appendix D Healthy Workplace Questionnaire (Chinese version)

### I. 個人資料

☐ 醫師 ☐ 護理人員 ☐ 其他

1. 性別: ☐ 男性 ☐ 女性
2. 婚姻狀況: ☐ 未婚 ☐ 已婚 ☐ 分居 / 離婚 ☐ 喪偶
3. 年齡: \_\_\_\_\_ 歲
4. 最高教育程度: ☐ 高中 ☐ 專科 ☐ 大學 ☐ 研究所以上
5. 目前體重 \_\_\_\_\_ 公斤
6. 目前身高 \_\_\_\_\_ 公分
7. 在這個急診室工作服務多久? \_\_\_\_\_ 年 \_\_\_\_\_ 月

### II. 健康狀況

8. 過去一年裡, 您曾因為 **生病** 而無法工作 \_\_\_\_\_ 天。
9. 過去一年裡, 您曾因為 **受傷** (在工作上或在家裡) 而無法工作 \_\_\_\_\_ 天。

10. 在過去一年裡, 您曾經有過下列任何健康問題而接受醫師的診斷和治療嗎? (可複選)

<input type="checkbox"/>	1	肺部疾病	<input type="checkbox"/>	2	氣喘
<input type="checkbox"/>	3	支氣管炎	<input type="checkbox"/>	4	心臟疾病 (如心肌梗塞、心衰竭)
<input type="checkbox"/>	5	糖尿病	<input type="checkbox"/>	6	中風
<input type="checkbox"/>	7	癌症	<input type="checkbox"/>	8	其他(請說明):
<input type="checkbox"/>	9	無	<input type="checkbox"/>		

11. 您家裡的任何成員 (父母、兄弟、姐妹) 曾經有過下列任何健康問題嗎? (可複選)

<input type="checkbox"/>	1	肺部疾病	<input type="checkbox"/>	2	氣喘
<input type="checkbox"/>	3	支氣管炎	<input type="checkbox"/>	4	心臟疾病 (如心肌梗塞、心衰竭)
<input type="checkbox"/>	5	糖尿病	<input type="checkbox"/>	6	中風
<input type="checkbox"/>	7	癌症	<input type="checkbox"/>	8	其他(請說明):
<input type="checkbox"/>	9	無	<input type="checkbox"/>		

12. 您認為自己

- ☐ 比同事健康  
☐ 跟同事的健康程度差不多  
☐ 比同事還不健康

13. 您有做運動嗎?

- ☐ 有, 請圈選您運動的類別: **(請接 15 題)**  
 (如跑步、慢跑、競走、游泳、騎腳踏車兜風、有氧運動 / 跳舞, 其他 \_\_\_\_\_)  
☐ 沒有 **(請續填 14 題)**

14. **假如** 您沒有運動, 原因是什麼?

- ☐ 沒有時間 ☐ 沒興趣 ☐ 缺乏便利的運動設備  
☐ 健康問題 ☐ 太累了, 因為工作很辛苦 ☐ 其他(請說明) \_\_\_\_\_

15. 如果您的工作場所提供便利的運動設施讓您使用, 請問您會去做運動嗎?

- ☐ 會 ☐ 不會

16. 您是一位  
☐ 抽菸者  
☐ 不抽菸者 (請接 19 題)  
☐ 過去曾經抽菸者(已停止抽菸至少一年)  
☐ 過去曾經抽菸者(已成功戒菸)
17. 假如您是一位抽菸者，您想戒菸嗎？  
☐ 想 ☐ 不想
18. 假如您是一位抽菸者而且想要戒菸，您有興趣參加戒菸俱樂部嗎？  
☐ 想 ☐ 不想
19. 在您的三餐中，有多常含有新鮮蔬菜、水果或豆類？  
☐ 每天三餐 ☐ 每天兩餐 ☐ 每天一餐
20. 您一個禮拜喝多少罐 (約 360 ml) 的啤酒？(如果沒有請寫“0”)  
 \_\_\_\_\_ 罐
21. 您一個禮拜喝多少杯 (約 150 ml) 的紅酒？(如果沒有請寫“0”)  
 \_\_\_\_\_ 杯
22. 您覺得您的工作和生活如何？  
☐ 非常滿意 ☐ 差強人意 ☐ 有困難

### III 健康改善的計畫

23. 未來一年裡，有哪些是你打算去做以提升或維持您的健康？ (以下選項可複選)

<input type="checkbox"/>	1	吃得健康	<input type="checkbox"/>	2	多做運動
<input type="checkbox"/>	3	從生活中移除主要的憂慮、緊張和壓力源	<input type="checkbox"/>	4	學習妥善處理憂慮、緊張和壓力源
<input type="checkbox"/>	5	換工作	<input type="checkbox"/>	6	改變我家裡的情況
<input type="checkbox"/>	7	戒菸或減少抽菸	<input type="checkbox"/>	8	減少喝酒
<input type="checkbox"/>	9	針對健康問題，接受治療	<input type="checkbox"/>	10	檢查我的血壓
<input type="checkbox"/>	11	試著控制我的血壓	<input type="checkbox"/>	12	無

24. 請就以上您所勾選的選項中，挑選 一項 最重要，而且是您明年裡為了健康想要去做的？ (請填號碼) \_\_\_\_\_。

25. 有哪些原因，可能會阻礙您做這樣的改變？ (以下選項可複選)

<input type="checkbox"/>	1	問題不是很嚴重，也不急	<input type="checkbox"/>	2	沒有足夠的時間
<input type="checkbox"/>	3	沒有足夠的活力	<input type="checkbox"/>	4	沒有足夠的錢
<input type="checkbox"/>	5	不知道如何開始	<input type="checkbox"/>	6	缺少家人或朋友的鼓勵和支持
<input type="checkbox"/>	7	缺少雇主的鼓勵和協助	<input type="checkbox"/>	8	實在太困難了
<input type="checkbox"/>	9	不想改變我的習慣	<input type="checkbox"/>	10	不確定我真得可以改變
<input type="checkbox"/>	11	現在有太大的壓力	<input type="checkbox"/>	12	缺乏自信
<input type="checkbox"/>	13	我不知道是什麼阻礙我	<input type="checkbox"/>		



#### IV. 對自我健康和工作的感受

26. 請對每項陳述做出適當選擇

	非常同意	同意	不確定	不同意	非常不同意
a)我可以完全掌握自己的健康	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)我對於工作中發生的事具有影響力	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)我的老闆知道工作壓力會對員工的健康有不好的影響	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)我的老闆盡所有努力將不必要的壓力減到最少	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)我很滿意當我工作表現良好，老闆給我的報償	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)我很滿意我在工作上參與決策的機會	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g)我的老闆真誠地關切員工的福祉	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h)我很滿意我在工作上得到的公平和尊重	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i)我覺得我對工作的付出得到了良好的報償	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j)我想只要我願意，我可以很輕鬆找到另一個比現在好的工作	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k)假如今天我必須去找另一份工作，我相信我具備了所有需要的技術和訓練	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l)在工作上，我覺得自己經常需要做些會對自己心理或身體健康不好的事情或決定	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m)整體而言，我喜歡我的工作	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n)我在意工作以外的一切為我主要人生的滿足	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. 整體來說，目前的工作對您的挑戰（技術和能力的運用）是：

☐太大 ☐太小 ☐剛剛好

#### V. 擔心、緊張、壓力

28. 過去 6 個月裡，急診室的工作有哪些事造成您過多的擔心、緊張或壓力? (以下選項可複選)

1	社會大眾對於急診醫護人員角色的期待	2	主管對我有不切實際的期望
3	輪班工作	4	超時或隨時待命的工作模式
5	急診工作步調太快	6	太多責任
7	面對不可預知的大量傷患	8	面對不明的傳染性疾病
9	工作內容太多改變或不確定性	10	過多的工作負荷
11	病人滯留在急診室時間太長	12	醫療疏失或糾紛
13	單位裡同事間的相處	14	急診室和其他部門的合作氣氛
15	工作場所裡可能發生的職業傷害和疾病	16	我的專業知識和技術無法配合急診工作上的需求
17	處理酗酒或藥物濫用的病患	18	處理精神異常的病患
19	處理死亡的議題	20	其他 (請說明):

29. 請就以上您所勾選的選項中，哪 **1 項** 是造成您在過去 6 個月裡 **工作上最大** 擔心、緊張或壓力的因素？(請填選項號碼)\_\_\_\_\_。

30. 當您覺得工作壓力很大時，您是如何處理的？(以下選項複選)

<input type="checkbox"/>	甚麼都不做	<input type="checkbox"/>	抽菸
<input type="checkbox"/>	做些自己興趣的事 (如看電影、唱歌)	<input type="checkbox"/>	好好睡一覺
<input type="checkbox"/>	找相關主管訴說	<input type="checkbox"/>	找朋友或家人訴說
<input type="checkbox"/>	吃藥 (如抗焦慮、抗憂鬱藥)	<input type="checkbox"/>	參加壓力管理課程
<input type="checkbox"/>	對其他人發脾氣	<input type="checkbox"/>	喝酒
<input type="checkbox"/>	運動或健身	<input type="checkbox"/>	到郊外散心
<input type="checkbox"/>	針對壓力源找出解決方法	<input type="checkbox"/>	其他(請說明):

## VI. 工作場所的健康和安全

31. 請就您目前急診的工作場所，選出讓您 **非常關切** 的情況 (請依據分類，選項複選)

### A. 設備和環境

<input type="checkbox"/>	缺乏足夠的安全設備及機具(如針筒收集盒、安全針具、移動滑板)	<input type="checkbox"/>	不足夠的個人防護設備(如隔離衣、手套、口罩、防護面罩)
<input type="checkbox"/>	太多吵雜聲	<input type="checkbox"/>	工作站設計不良
<input type="checkbox"/>	工作空間狹小或不利於活動	<input type="checkbox"/>	缺乏為身心障礙員工 / 病人設想的設施
<input type="checkbox"/>	工作區域太亂、太髒	<input type="checkbox"/>	缺乏足夠及便利的盥洗室設施
<input type="checkbox"/>	缺乏足夠的隔離房或空間安置有特殊健康需求的病人	<input type="checkbox"/>	缺乏足夠的洗手檯及洗手劑
<input type="checkbox"/>	缺乏足夠的警衛人員及警備系統	<input type="checkbox"/>	員工缺乏隱蔽的休息空間

### B. 健康服務和管理

<input type="checkbox"/>	我不是很清楚急診室裡的標準工作流程和安全規章	<input type="checkbox"/>	我覺得目前所提供的職業健康和安全的訓練課程並不足夠或無法配合我在工作上的需求
<input type="checkbox"/>	我沒有收到和我工作相關的最新醫療訊息	<input type="checkbox"/>	缺乏疫苗計畫(如流感疫苗、肝炎疫苗)
<input type="checkbox"/>	缺乏常規身體健康檢查	<input type="checkbox"/>	缺乏清楚指示和有效率的職災監控系統 (預防、通報及追蹤)

### C. 工作性質

<input type="checkbox"/>	不良的姿勢 / 重複性的動作	<input type="checkbox"/>	輪班
<input type="checkbox"/>	有太多不確定性和挑戰	<input type="checkbox"/>	太多的工作量
<input type="checkbox"/>	有機會接觸受到酒精或藥物影響的人	<input type="checkbox"/>	不夠時間休息 (吃飯或上廁所)
<input type="checkbox"/>	擔心遇到無預警的大量災害或不清楚的傳染病	<input type="checkbox"/>	和其他人員的衝突 (同事、主管、病人或其家屬)

#### D. 組織層面

	主管的領導風格		醫院在制定職場安全的政策時，並沒有考量基層人員的意見及需求
	職場的健康和安全在急診室裡並不受到重視		院方著重在提升病人醫療品質，卻忽略急診醫護人員的權利和福利
	長期急診室醫護人員的不足或高流動率		急診病人轉往後續治療的流程 (如住院、轉往其他單位或其他醫院) 並不順暢。

32. 以下為急診室裡常出現的職業危害因子，請勾選出 **3 項** 您最關切的事。

	血液或體液性的傳染疾病 (如 AIDS, Hepatitis)		空氣傳播性的傳染疾病 (如 TB, SARS, 新型流感)
	工作壓力		電的危害 (如電擊器)
	化學物質的危害 (如 殺菌劑、消毒劑、化學治療藥物)		跌倒或滑倒
	X 光或其他放射性危害		輪班的工作形態
	病人或其家屬的暴力 (身體或語言上的)		同事或主管的霸凌或性騷擾
	骨骼肌肉的過度疲勞 / 傷害 (如肩頸、手腕、下背部)		其他 (請說明):

33. 您在急診室工作期間，曾經因為工作而造成以下的傷害或疾病嗎？

☐ 沒有 (請接 35 題)

☐ 有 (請勾選合適的項目)

	呼吸道疾病 (如 TB、新型流感)		血液傳染病 (如 Hepatitis, AIDS)
	心血管疾病 (如高血壓、心臟病、中風)		賀爾蒙或代謝方面的疾病 (如月經異常、甲狀腺機能異常、糖尿病)
	身體上的開放性傷口 (如針扎、穿刺傷、切割傷)		骨骼肌肉傷害 (如下背痛、扭傷、跌倒、骨折、挫傷)
	心理層面的問題 (如壓力過大、憂鬱症、躁鬱症)		癌症 (請說明類別):
	妊娠異常 (如流產、早產、胎兒畸形)		其他 (請說明):

34. 請問您過去是如何處理？

- ☐ 沒有向醫院相關單位通報  
☐ 只完成通報，但沒有配合事後追蹤及治療  
☐ 遵照院內相關通報流程，並配合完成事後追蹤及治療

35. 如果主管要求您去做一些您認為會危害到您的健康和安全的東西，請問您將會如何處理？

- ☐ 無論如何我都會去做，而且不會向任何主管單位抱怨  
☐ 我會去做，但事後會向主管單位抱怨  
☐ 我不會去做，直到我確認不再有任何危險  
☐ 我不確定我將會如何處理

## VII. 健康方面的興趣

36. 假如您目前的醫院有舉辦健康促進的活動，您會感興趣參加嗎？

- ☐ 會  
☐ 不會

37. 您比較喜歡在上班或下班時間參加有關健康的講習？

- ☐ 上班時段  
☐ 下班時段

38. 您願意自掏腰包參加健康促進的計畫嗎？

- ☐ 願意  
☐ 不願意

39. 下列哪些主題是您感興趣的？(可複選)

	1	運動		2	飲食健康和營養
	3	壓力管理		4	抽菸的危險
	5	喝酒的危險		6	工作傷害
	7	心血管疾病：高血壓、心臟病		8	糖尿病
	9	癌症		10	其他 (請說明):

40. 請問您對於所服務的醫院之 **健康促進計畫** 有任何其他的建議嗎？

41. 醫院裡為員工舉辦的健康促進活動，您曾經參加過何種項目？\_\_\_\_\_

**謝謝您寶貴的時間，並請確認所有的問題是否都已回答。**

## Appendix E Healthy Workplace Questionnaire

### **I. Personal data:**

- ☐ Physician ☐ Nurses ☐ Others
1. Gender: ☐ Male ☐ Female
  2. Marital status: ☐ Single ☐ Married ☐ Separated / divorced ☐ Widow
  3. Age: \_\_\_\_\_ Y/O
  4. Highest level of education attained:  
☐ Senior high school ☐ Diploma ☐ University ☐ Postgraduate or higher
  5. Weight: \_\_\_\_\_ Kg
  6. Height: \_\_\_\_\_ cm
  7. How long have you worked in this emergency department? \_\_\_\_\_ year(s) \_\_\_\_\_ month(s)

### **II. Health Status**

- 8.. How many days you were unable to work due to sickness in the last year? \_\_\_\_\_ days
9. How many days you were unable to work due to injury (at work) in the last year? \_\_\_\_\_ days
10. Have you had any of the following health problems diagnosed or treated by a doctor in the last year? (Check all the items that apply to you)

<input type="checkbox"/>	Lung diseases	<input type="checkbox"/>	Asthma
<input type="checkbox"/>	Bronchitis	<input type="checkbox"/>	Cardiovascular diseases(e.g. Heart attack; Heart Failure, )
<input type="checkbox"/>	Diabetes	<input type="checkbox"/>	Stroke
<input type="checkbox"/>	Cancers	<input type="checkbox"/>	Others (Specify):
<input type="checkbox"/>	None	<input type="checkbox"/>	

11. Have you any of your family members (parent, brother, sister) ever had any of the following health problems? (Check all the items that apply to you)

<input type="checkbox"/>	Lung diseases	<input type="checkbox"/>	Asthma
<input type="checkbox"/>	Bronchitis	<input type="checkbox"/>	Cardiovascular diseases(e.g. Heart attack; Heart Failure, )
<input type="checkbox"/>	Diabetes	<input type="checkbox"/>	Stroke
<input type="checkbox"/>	Cancers	<input type="checkbox"/>	Others (Specify):
<input type="checkbox"/>	None	<input type="checkbox"/>	

12. In general, how do you consider your health status?  
☐ Healthier than your colleagues ☐ At the same level of health as your colleagues  
☐ Less healthy than your colleagues
13. Do you do exercise?  
☐ Yes. Please underline the type of exercise you do: **(Please continue Question 15)**  
(e.g. running, jogging, brisk walking, swimming, cycling, aerobic exercise / dance, other \_\_\_\_\_)  
☐ No **(Please continue Question 14)**

14. If you do not exercise, what are your reasons?

- ☐ Lack of time    ☐ Not interested    ☐ No convenient facilities available for exercising  
☐ Health problems    ☐ Too tired because of hard work    ☐ Others (Specify) \_\_\_\_\_

15. Would you do exercise if facilities were provided at the workplace for your use?

- ☐ Yes  
☐ No

16. Do you smoke?

- ☐ Yes  
☐ No **(Please continue Question 19)**  
☐ Ex-smoker (stopped smoking completed for at least 1 year)  
☐ Ex-smoker (stopped smoking completely)

17. If you are a smoker, do you want to stop smoking?

- ☐ Yes  
☐ No

18. If you are a smoker and would like to stop smoking, would you be interested in joining a Smoking Cessation Club?

- ☐ Yes  
☐ No

19. How often do you include fresh fruit, vegetables, beans or peas in your meals (breakfast, lunch and dinner)?

- ☐ In all 3 meals of the day  
☐ In 2 out of 3 meals of the day  
☐ In 1 out of 3 meals of the day

20. How many regular size ( about 360 ml) bottles of beer do you drink in a typical week? If none, put '0'.

\_\_\_\_\_ Bottles

21. How many glasses (about 150 ml) of wine do you drink in a typical week? If none, put '0'.

\_\_\_\_\_ Glasses

22. How do you feel about your job and life?

- ☐ Very good  
☐ Rather good  
☐ Having difficulties

### **III. Plans of health improvement**

23. What, if anything, would you like to do in the next year to improve or maintain your health? (Check all the items that apply to you)

<input type="checkbox"/>	Eat better	<input type="checkbox"/>	Exercise more
<input type="checkbox"/>	Remove a major source of worry, nerves or stress from life or work	<input type="checkbox"/>	Learn to cope better with worry, nerves or stress
<input type="checkbox"/>	Change jobs	<input type="checkbox"/>	Change my home situation
<input type="checkbox"/>	Quit smoking, or smoke less	<input type="checkbox"/>	Drink less alcohol
<input type="checkbox"/>	Get medical treatment or consultation for health problems	<input type="checkbox"/>	Have my blood pressure checked
<input type="checkbox"/>	Try to control my blood pressure	<input type="checkbox"/>	Nothing

24. Of all the things you just checked, which is the single most important thing you would like to do for your health in the next year? (Write the number from the list above here) \_\_\_\_\_

25. What, if anything, is stopping you from making this change? (Check all the items that apply to you)

<input type="checkbox"/>	Problem is not serious; there is no rush	<input type="checkbox"/>	Not enough time
<input type="checkbox"/>	Not enough energy	<input type="checkbox"/>	Not enough money
<input type="checkbox"/>	Do not know how to get started	<input type="checkbox"/>	No encouragement from family and friends
<input type="checkbox"/>	No encouragement or help from employer	<input type="checkbox"/>	It is too hard
<input type="checkbox"/>	Do not want to change my ways	<input type="checkbox"/>	Not sure I can really make a difference
<input type="checkbox"/>	Too much stress right now	<input type="checkbox"/>	Lack of self-confidence
<input type="checkbox"/>	I do not know what is stopping me	<input type="checkbox"/>	

#### **IV. Feelings about my health and my job**

26. Please make an appropriate choice about the following statements

	Agree strongly	Agree	Not sure	Disagree	Disagree strongly
a) I am in control of my own health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) I have an influence over the things that happen to me at work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) My employer knows that stress at work can have bad effects on employees' health.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) My employer makes every effort to keep unnecessary stress at work to a minimum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) I am satisfied with the recognition I receive from my employer for doing a good job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) I am satisfied with the amount of involvement I have in decisions that affect my work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) My employer has a sincere interest in the wellbeing of its employees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) I am satisfied with the fairness and respect I receive on the job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) I feel I am well rewarded for the level of effort I put into my job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) I think that, if I wanted to, I could quite easily find another job at least as satisfying as this one.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) If I had to find another job today, I think I would have all the skills and training I would need to do so.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) At work, I feel I often have to do things or make decisions that I know are bad for my mental or physical health.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) On the whole, I like my job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) I look outside of my job for my main satisfaction in life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. On the whole, does your present job challenge you (make use of your skills and abilities)?

- ☐ Too much  
☐ Too little  
☐ Just enough

#### **V. Worry, nerves, stress**

28. What, if anything, caused you excessive worry, nerves or stress **at ED work** in the last 6 months? (Check all the items that apply to you)

	1	Unreasonable expectations from the public		2	Unreasonable expectations from the managers
	3	Shift work		4	Overtime
	5	High speed work process in ED		6	Too much responsibility
	7	Confronting unpredictable flow of patients		8	Confronting diseases with unknown transmission
	9	Too many changes or uncertainties on work		10	Excessive workloads
	11	Patients' prolonged stay in EDs		12	Medical malpractice and disputes
	13	Poor relationships with colleagues		14	The collaborations between EDs and other care units
	15	Work-related injuries or diseases		16	The demands of professional knowledge and skills to provide care
	17	Dealing with patients with alcohol or drug abuse		18	Dealing with patients with psychological diseases
	19	Dealing with deaths		20	Other (Specify):

29. In the above items, which one is the issue that caused you the most excessive worry, nerves or stress **at work** in the last 6 months? (Please fill in the number) \_\_\_\_\_

30. What do you do when you feel great job stress? (Check all the items that apply to you)

	Do nothing		Smoke
	Do something interesting (e.g. watching movie, singing)		Get a good sleep
	Talk to relevant managers		Talk to friends or family
	Take medicine (e.g. anti-anxiety and anti-depression)		Attend the class of stress management
	Get anger with other people		Drink alcohol
	Do exercise		Go to outdoors to relax
	Find solutions for the sources of stress		Other (Specify):



## **VI. Workplace health and safety**

31. Please indicate the health and safety concerns that you have in your workplace by checking the relevant items below (You may check more than one for each category)

### *A. Physical environment and equipment supply*

<input type="checkbox"/>	Inadequate provision of safety devices (e.g. sharps containers, safe needles, shields, slides)	<input type="checkbox"/>	Inadequate provision of personal protective equipment (e.g. clothing, gloves, masks)
<input type="checkbox"/>	Too much noise	<input type="checkbox"/>	Inappropriate work station design
<input type="checkbox"/>	Inadequate working space	<input type="checkbox"/>	Lack of facilities or access for employees / patients with disabilities
<input type="checkbox"/>	Litter or mess in working area	<input type="checkbox"/>	Inadequate toilet facilities
<input type="checkbox"/>	Inadequate isolation room to accommodate the patients with special health needs	<input type="checkbox"/>	Inadequate sink facilities and hand sanitizer
<input type="checkbox"/>	Inadequate security system and personnel	<input type="checkbox"/>	Lack of private room for staff to take a break.

### *B. Health service and management*

<input type="checkbox"/>	Unclear standards of work procedure and safety regulations in ED	<input type="checkbox"/>	Inadequate training programs of occupational health and safety to address the needs at work
<input type="checkbox"/>	Lack of updated medical information related to the work	<input type="checkbox"/>	Lack of vaccination programs (e.g. flu, hepatitis vaccine)
<input type="checkbox"/>	Lack of routine health surveillance	<input type="checkbox"/>	Lack of clear instructions and effective occupational exposure management (prevention, report and follow up)

### *C. Work characteristics*

<input type="checkbox"/>	Awkward postures / repetitive motions	<input type="checkbox"/>	Shift work
<input type="checkbox"/>	Too much uncertainty and challenge at work	<input type="checkbox"/>	Heavy workloads
<input type="checkbox"/>	Contact with people affected by alcohol and drug	<input type="checkbox"/>	Inadequate time to take a break (toilet or eating)
<input type="checkbox"/>	Worry about facing unpredictable disaster or diseases with unknown transmission	<input type="checkbox"/>	Conflicts with other people at work (colleagues, managers, patients and family)

### *D. Organizational aspects*

<input type="checkbox"/>	Inappropriate leadership	<input type="checkbox"/>	Hospital does not consider staff opinion and needs in decision-making regarding workplace safety
<input type="checkbox"/>	Workplace health and safety has not been emphasized in ED	<input type="checkbox"/>	Managers endeavor to improve quality of care for patients but ignore the rights and welfare among health care workers in ED
<input type="checkbox"/>	Long-term staff shortage or high turnover in ED	<input type="checkbox"/>	Difficulty in process of transferring patients after ED treatment (e.g. admission, transfer to other care units or hospitals)

32. The items listed below are the most common occupational hazards in EDs. Please indicate **3 items** which you are very concerned about in your workplace.

<input type="checkbox"/>	Blood or body fluid pathogens (e.g. AIDS, Hepatitis)	<input type="checkbox"/>	Air-borne pathogens (e.g. TB, SARS, Flu)
<input type="checkbox"/>	Work stress	<input type="checkbox"/>	Electrical hazard
<input type="checkbox"/>	Chemical hazard (e.g. antiseptic, disinfectants, chemotherapeutic agents)	<input type="checkbox"/>	Falls or slips
<input type="checkbox"/>	X - ray or other radiation hazard	<input type="checkbox"/>	Shift work
<input type="checkbox"/>	Violence from patients or their family (physical or verbal)	<input type="checkbox"/>	Bullying or sexual harassment from colleagues or managers
<input type="checkbox"/>	Musculoskeletal disorders (e.g. low back pain, neck, shoulder or wrist injuries)	<input type="checkbox"/>	Other (Specify):

33. Have you ever got an injury or disease at work while working in an ED?

- ☐ No (**Please continue Question 35**)  
☐ Yes (Check all the items that apply to you)

<input type="checkbox"/>	Respiratory transmissible diseases (e.g. TB, Flu)	<input type="checkbox"/>	Blood – borne transmissible diseases (e.g. AIDS, Hepatitis)
<input type="checkbox"/>	Cardiovascular diseases (e.g. hypertension, heart diseases, stroke)	<input type="checkbox"/>	Hormonal or metabolic diseases (e.g. menstrual disorders, dysfunctions of thyroid, diabetes)
<input type="checkbox"/>	Open wounds (e.g. needlestick injuries, cutting wounds)	<input type="checkbox"/>	Musculoskeletal injuries (e.g. low back pain, falls, fractures, contusions)
<input type="checkbox"/>	Mental health-related problems (e.g. excessive stress, depression, anxiety)	<input type="checkbox"/>	Cancers (Specify):
<input type="checkbox"/>	Pregnancy problems (e.g. abortion, premature, fetus deformity)	<input type="checkbox"/>	Other (Specify):

34. What did you do when you got an injury or disease at work?

- ☐ I did not make an official report to the hospital.  
☐ I reported the incident, but did not complete the post – exposure procedure.  
☐ I completed the incident report procedure.

35. What would you do if your supervisor told you to do something that you thought was dangerous for your health and safety?

- ☐ I would do it anyway and not complain to anyone in authority  
☐ I would do it, but complain to someone in authority later  
☐ I would not do it until I was satisfied that there was no danger  
☐ I am not sure what I would do

## **VII. Health interests**

36. Would you be interested in participating in a health promotion program if it was conducted at your enterprise?

- ☐ Yes  
☐ No

37. Would you prefer to attend health sessions during or after working hours?

☐ During working hours

☐ After working hours

38. Are you willing to pay some money to participate in a health promotion program?

☐ Yes

☐ No

39. Which of the following topics are you interested in? (Check all items that apply to you)

<input type="checkbox"/>	1	Exercises	<input type="checkbox"/>	2	Nutritional and healthy diet
<input type="checkbox"/>	3	Stress management	<input type="checkbox"/>	4	Risk of smoking
<input type="checkbox"/>	5	Risk of alcohol consumption	<input type="checkbox"/>	6	Work - related injuries
<input type="checkbox"/>	7	Cardiovascular diseases	<input type="checkbox"/>	8	Diabetes
<input type="checkbox"/>	9	Cancers	<input type="checkbox"/>	10	Others (Specify):

40. Do you have any other suggestions to improve the programs of health promotion in your hospitals?

41. Have you participated in any health promotion programs which your hospital designed for the staff?

**Thanks your time and please make sure you have responded to all questions.**

## Appendix F Guidelines for ED Workplace Violence Prevention

檔 號：  
保存年限：

台灣醫院協會 函

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受文者：

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速別：速件

密等及解密條件或保密期限：普通

附件：『醫院安全作業安全參考指引計畫』-急診暴力事件安全作業參考指引、急診警衛及安全作業參考指引

主旨：鑑於日前發生醫院病人痛毆醫事人員之暴力事件，本會呼籲全國會員醫院儘速審視院內相關防暴作業及緊急應變程序，詳如說明，敬請 查照。

說明：

- 一、鑑於日前曾有醫院發生病人及病人家屬，因醫療爭議案件痛毆院內所屬醫事人員並脅迫下跪等暴力事件，本會深表痛心，並對受暴醫事人員致上慰問之意，本會亦對國內醫病關係日益惡化氛圍深感憂心。
- 二、醫院治療病人疾病之處所，亦是醫事人員執業之服務場所，應是極為安全之工作領域。今，隨國內醫病關係日益惡化，竟發生病人痛毆醫事人員之事件，本會提醒並呼籲 貴院儘速審視院內相關防暴作業及緊急應變程序，以防範任何類似案件繼續發生之風險，共同負起維護提供全國醫事人員安全職場之職責。
- 三、本會業已於民國 91 年起接受行政院衛生署委託制訂『醫院安全作業參考指引』，針對醫院暴力事件之應變，設計指引，如：急診暴力事件安全作業參考指引、急診警衛及安全作業參考指引，詳如附件，提供予 貴院進行全面檢視或演練之參考，

敬請 卓參。

四、本會聯絡人：顏正婷專員 電話：02-28083300 分機 23。

正本：乃榮醫院、大千綜合醫院、三軍總醫院附設基隆民眾診療服務處、三軍總醫院澎湖院區、大園敬盛醫院、中山醫學大學附設醫院、中山醫療社團法人中山醫院、中心診所醫療財團法人中心綜合醫院、中英醫療社團法人中英醫院、中國醫藥大學北港附設醫院、中國醫藥大學附設醫院、中國醫藥大學附設醫院豐原分院、公祥醫院、仁愛醫療財團法人大里仁愛醫院、中壢敬盛醫院、天主教仁慈醫療財團法人仁慈醫院、天主教台東聖母醫院、天成醫院、天晟醫院、文雄醫院、台大醫院北護分院、台北市立萬芳醫院、台北市立聯合醫院、台北市立關渡醫院、台南市立醫院、台灣基督教長老教會新樓醫療財團法人台南新樓醫院、光田醫療社團法人光田綜合醫院、伍倫醫療社團法人人員榮醫院、同慶醫院、安泰醫院、安泰醫療社團法人安泰醫院、安泰醫療社團法人潮州安泰醫院、竹山秀傳醫院、行政院國軍退除役官兵輔導委員會台中榮民總醫院、行政院國軍退除役官兵輔導委員會台北榮民總醫院、行政院國軍退除役官兵輔導委員會永康榮民醫院、行政院國軍退除役官兵輔導委員會玉里榮民醫院、行政院國軍退除役官兵輔導委員會竹東榮民醫院、行政院國軍退除役官兵輔導委員會員山榮民醫院、行政院國軍退除役官兵輔導委員會埔里榮民醫院、行政院國軍退除役官兵輔導委員會桃園榮民醫院、行政院國軍退除役官兵輔導委員會高雄榮民總醫院、行政院國軍退除役官兵輔導委員會臺東榮民醫院、行政院國軍退除役官兵輔導委員會鳳林榮民醫院、行政院國軍退除役官兵輔導委員會龍泉榮民醫院、行政院國軍退除役官兵輔導委員會蘇澳榮民醫院、行政院衛生署台中醫院、行政院衛生署台北醫院、行政院衛生署台南醫院、行政院衛生署朴子醫院、行政院衛生署竹東醫院、行政院衛生署花蓮醫院、行政院衛生署南投醫院、行政院衛生署屏東醫院、行政院衛生署苗栗醫院、行政院衛生署桃園醫院、行政院衛生署胸腔病院、行政院衛生署華屯療養院、行政院衛生署基隆醫院、行政院衛生署新竹醫院、行政院衛生署新營醫院、行政院衛生署彰化醫院、行政院衛生署旗山醫院、行政院衛生署澎湖醫院、行政院衛生署豐原醫院、行政院衛生署雙和醫院、西園醫院、佑民醫療社團法人佑民醫院、宏仁醫院、宏恩醫療財團法人宏恩綜合醫院、杏和醫院、李綜合醫療社團法人大甲李綜合醫院、李綜合醫療社團法人苑裡李綜合醫院、秀傳醫院、秀傳醫療社團法人秀傳紀念醫院、秀傳醫療財團法人彰濱秀傳紀念醫院、阮綜合醫療社團法人阮綜合醫院、奇美醫療財團法人奇美醫院、奇美醫療財團法人柳營奇美醫院、居善醫院、宜蘭普門醫療財團法人普門醫院、怡仁綜合醫院、東元綜合醫院、東勢鎮農會附設農民醫院、板新醫院、林新醫療社團法人林新醫院、板橋中興醫院、板橋國泰醫院、林醫院、長庚醫療財團法人台北長庚紀念醫院及其林口長庚紀念醫院、長庚醫療財團法人桃園長庚紀念醫院、長庚醫療財團法人高雄長庚紀念醫院、長庚醫療財團法人基隆長庚紀念醫院、長庚醫療財團法人嘉義長庚紀念醫院、信一骨科醫院、信生醫院、南門綜合醫院、冠華醫院、建佑醫院、洪宗鄰醫院、員林何醫院、埔基醫療財團法人埔里基督教醫院、振興醫療財團法人振興醫院、桃新醫院、烏日澄濟醫院、祐民醫院、財團法人天主教若瑟醫院、財團法人天主教耕莘醫院、財團法人天主教耕莘醫院永和分院、財團法人天主教聖功醫院、財團法人天主教聖保祿修女會醫院、財團法人天主教聖馬爾定醫院、財團法人天主教聖醫羅東聖母醫院、財團法人台東基督教醫院、財團法人台灣省私立台北仁濟院附設仁濟療養院新莊分院、財團法人台灣省私立台北仁濟院附設仁濟醫院、財團法人台灣省私立桃園仁愛之家附設新竹新生醫院、財團法人佛教慈濟綜合醫院、財團法人佛教慈濟綜合醫院台北分院、財團法人佛教慈濟綜合醫院玉里分院、財團法人佛教慈濟綜合醫院關山分院、財團法人私立臺北醫學大學附設醫院、財團法人恆春基督教醫院、財團法人為恭紀念醫院、財團法人思主公醫院、財團法人高雄基督教信義醫院、財團法人景仁醫院、財團法人辜公亮基金會和信治癌中心醫院、財團法人彰化基督教醫院、財團法人彰化基督教醫院二林分院、財團法人彰化基督教醫院雲林分院、財團法人臺灣基督教門諾會醫院、財團法人羅許基金會羅東博愛醫院、馬偕紀念醫院、馬偕紀念醫院台東分院、馬偕紀念醫院新竹分院、高雄市立大同醫院、高雄市立小港醫院、高雄市立民生醫院、高雄市立岡山醫院、高雄市立凱旋醫院、高雄市立旗津醫院、高雄市立聯合醫院、高雄縣立鳳山醫院、高雄醫學大學附設中和紀念醫院、健仁醫院、健新醫院、國仁醫院、國立成功大學醫學院附設醫院、國立成功大學醫學院附設醫院斗六分院、國立陽明大學附設醫院、國立臺灣大學醫學院附設醫院、國立臺灣大學醫學院附設醫院雲林分院、國防醫學院三軍總醫院、國軍台中總醫院、國軍北投醫院、國軍左營總醫院、國軍岡山醫院附設民眾診療服務處、國軍松山醫院附設民眾診療服務處、國軍花蓮總醫院、國軍桃園總醫院、國軍高雄總醫院、國軍高雄總醫院附設屏東民眾診療服務處、國軍新竹地區醫院附設民眾診療服務處、國泰醫療財團法人汐止國泰綜合醫院、國泰醫療財團法人國泰綜合醫院、國泰醫療財團法人新竹國泰綜合醫院、基隆市立醫院、基督復臨安息日會臺安醫院、婦女醫院、敬盛綜合醫院、清泉醫院、郭綜合醫院、善工醫療財團法人屏東基督教醫院、博仁綜合醫院、惠仁醫院、惠德醫院、景美醫院、曾漢

棋綜合醫院、童綜合醫療社團法人童綜合醫院、郵政總局郵政醫院、陽明醫院、順安醫院、安仁醫院、新仁醫院、新仁醫院、新北市立聯合醫院、新永和醫院、新光醫療財團法人新光吳火獅紀念醫院、新昆明綜合醫院、新泰宜婦幼醫院、新泰綜合醫院、新國民醫院、新惠和醫院、新菩提醫院、新興醫療社團法人新興醫院、義大醫療財團法人義大醫院、漢銘醫院、臺中榮民總醫院嘉義分院、臺中榮民總醫院灣橋分院、臺安醫院、輔英科技大學附設醫院、鳳山大東醫院、劉光雄醫院、劉嘉修醫院、廣聖醫院、澄清綜合醫院、樹林仁愛醫院、蕭志文醫院、靜和醫院、龍潭敏盛醫院、戴德森醫療財團法人嘉義基督教醫院、臨海醫院、豐安醫院、醫療財團法人徐元智先生醫藥基金會附設亞東紀念醫院、醫療財團法人臺灣區煤礦業基金會臺灣礦工醫院、堰新醫院、霧峰澄清醫院、寶建醫療社團法人寶建醫院

副本：

理事長 吳德朝

## 主題：急診暴力事件安全作業參考指引

### 壹、 目的

建立急診暴力事件處置作業標準，降低暴力事件機率並減少後遺症。

### 貳、 適用範圍

所有急診相關工作人員、病人及家屬等。

### 參、 安全指引

#### 一、 基本條件

- (一) 急診部門應有暴力及安全相關事件之處置流程工作規範。
- (二) 訂定急診暴力及安全相關事件通報系統。
- (三) 暴力及安全相關事件處置教育訓練。
- (四) 急診暴力及安全相關事件報表。
- (五) 急診暴力及安全相關事件處置及通報紀錄。

#### 二、 確認有暴力或安全的特殊情況

- (一) 精神疾病病人。
- (二) 酒醉或藥物濫用病人。
- (三) 意識不清之病人。
- (四) 與他人有糾紛或其他可能導致人身安全顧慮之病人。
- (五) 不理智且有非份要求的病人或家屬。
- (六) 攜帶危險物品的病人或家屬。
- (七) 語言恐嚇傾向或已發生。
- (八) 武力恐嚇傾向或已發生。

#### 三、 處置流程綱要

- (一) 有安全疑慮或發生暴力時，立即安全求助及行政通報，並紀錄事件。
- (二) 依情況需要，進行醫療人員工作協調或調度。

- (三) 適情況所需，通報當地警察機關並請求維安。
- (四) 病人因病情可能傷害自己或他人，經勸導與心理支持無效後，可進行藥物處置或肢體約束。
- (五) 已造成傷害者，除立即進行傷害評估紀錄與處置外，必須研擬日後防範或減災的措施。

#### 四、 監測指標

- (一) 暴力及安全相關事件處置流程工作規範。
- (二) 暴力及安全相關事件處置教育訓練。
- (三) 暴力事件處置及通報紀錄。

#### 肆、 建議事項：

- 一、 急診為處理急重症患者的醫療區域，不宜充做醫院夜間與假日出入的通道，對於進出急診的人士也必須有適當的管制。
- 二、 依個別主客觀條件，訂定暴力及安全相關事件處置流程工作規範。
- 三、 定期舉辦暴力及安全相關事件處置教育訓練(含演習)。
- 四、 良好的空間與動線，並輔以有效的安全措施(如保全人員、監視錄影器材、警民連線等)。
- 五、 對於已發生的暴力或安全事件，除進行傷害評估記錄與處置外，必須研擬日後防範或減災措施。



## **主題：急診警衛及安全作業參考指引**

### **壹、 目的**

保障急診病人，工作人員及環境安全之作業標準。

### **貳、 適用範圍**

所有急診相關工作空間，包括自急診部門出入口、診療室至所有留觀室及各類檢查、檢驗部門之相關工作人員及病人。

### **參、 安全指引**

#### **一、 基本條件**

- (一) 急診部門應有全天候 24 小時警衛，並訂定工作規範。
- (二) 急診部門應有警衛或保全人員及符合法規之出入口。
- (三) 電視或電子監視系統。
- (四) 急診部門應有與地區警察機關聯繫之通聯機制。
- (五) 訂定急診警衛與安全之主管部門及層級通報系統。

#### **二、 任務**

- (一) 維持急診診療環境之秩序並協助各項事故之處理。
- (二) 維護工作人員及病人之人身及財產安全。
- (三) 發生新聞事件時負責維持秩序與保障病人隱私。
- (四) 負責維持急診出入口及相關道路順暢。
- (五) 處理、紀錄及通報突發事件。
- (六) 病人運送時之管制與安全。
- (七) 協助維護並維持大量傷患發生時之動員秩序。
- (八) 協助行動不便病人就診及離院。

#### **三、 工作要則**

- (一) 警衛及安全相關作業規範應本於「以病人為中心」，著重於病人及工作人員之安全。
- (二) 應隨身佩帶警衛工具及無線電通信工具。
- (三) 事故處理紀錄及交接班紀錄。
- (四) 主動處理急診與安全、暴力相關之事項。

(五) 無法處置之事件應立即通報上級主管或當地警察機關。

**四、 監測指標**

- (一) 病人因暴力事件傷害之人數及比例
- (二) 工作人員因暴力事件傷害之人數及比例
- (三) 定期參與教育訓練課程比例

**肆、 建議事項**

- 一、 工作人員防暴訓練課程
- 二、 定期參與暴力及安全相關訓練

## **Appendix G Conference Publication**















## **Appendix H Journal Publication**