

國立臺灣大學公衛學院職業醫學與工業衛生研究所

博士論文

Graduate Institute of Occupational Medicine and Industrial Hygiene

College of Public Health

National Taiwan University

Doctoral dissertation



職業傷害勞工受傷後第六年的心理健康與生活品質

Occupationally injured workers' mental health and
HRQOL: six-year follow-up study

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中華民國 106 年 01 月

January, 2017



國立臺灣大學博士學位論文 口試委員會審定書

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six-year follow-up study

本論文係秦唯珊君 (D01841004) 在國立臺灣大學職業醫學與工業衛生研究所完成之博士學位論文，於民國 106 年 01 月 23 日承下列考試委員審查通過及口試及格，特此證明

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致謝



四年四個月又十三天。回首過往，我，內心滿是感謝與感動。『研究』就像是沒有盡頭的馬拉松一樣，每天都經歷著類似的風景，沒有同伴是無法獨自走完這些路。

這一路上要感謝的人實在太多了，首先要感謝啟發我研究興趣，以及一直支持鼓勵、教導我的指導教授們，郭育良老師與蕭淑銖老師。謝謝老師們總是這麼認真努力，對自己高標準的要求，在待人處事與學術上，都給了我最好的典範；也謝謝老師們，給我最大的自由與包容，讓我可以保有自己的個性自在快樂地學習；更感謝老師們始終對我保有信心，因為您們的信任，讓我想要成為更好的自己，而我也會謹記老師的教誨，『保守自己的心，不知的永遠承認不知。保持研究熱忱、以研究發現來關切世界。』。除了指導教授們，這一路走來，相當感謝廖士程老師，沒有老師精神醫學專業的協助，本計畫完全無法完成。謝謝老師總是當我們最佳救火隊，每次找老師幫忙時，老師總是保持一貫謙沖與幽默的態度，大力幫忙我們解決疑難雜症。此外，也非常感謝陳志傑教授、黃耀輝教授、與蕭妃秀教授的指導，您們的指導與建議，讓我的研究更加完整，也讓我的思考更加深入與開闊。

研究專業上，除了老師們的教導與支持外，也感謝郭家與蕭家學長姊妹們的幫助，謝謝統計超級厲害的敬淳醫師，凡人無法解決的複雜問題，他總是能夠輕輕鬆鬆解決，也謝謝他 PPT 製作的這麼優秀，激勵我想更好的決心。謝謝秉鈺學姊總是那麼溫暖地主動提供協助，我，內心深受感動；謝謝健保資料庫高手，士群，大方地教導我許多 SAS code；感謝雪菁學姊、立潔、育茹、宣傳、與依儒的大力幫忙研究，沒有你們我一人無法完成如此艱巨的工作。也謝謝遠在芝加哥的挺迪，謝謝你的陪伴與鼓勵，我會記得我們一起努力的日子。謝謝 339 實驗室的育禎與雅惠，感謝你們日常的照顧，跟包容我的任性與怪異。我的博士班戰友，

楊曜旭與吳涵涵同學們，謝謝你們這近五年來的陪伴，我會記得那些低落的時刻，有你們的陪伴與鼓勵，讓我能夠繼續打起精神面對困難。此外，也非常謝謝你們這麼善良、優秀與努力，讓我也想讓自己變得跟你們一樣好。

最後，要感謝我的家人們。首先要感謝我的父親秦茂庭先生，與母親丁秋瑛女士。謝謝您們，相信我，並且支持著我的每一個夢想。再來，要感謝我親愛的哥哥秦唯哲先生，與嫂嫂戴雪莉女士，謝謝您們總是默默地支持與關心我，也感謝您們把家裡照顧的那麼好，讓我無後顧之憂。也謝謝我的姪女侄兒們總是那麼天真可愛，任我玩弄。

一路走來，要感謝的人真的太多了，除了感謝身邊的每一個人外，也感謝所有研究個案們，謝謝您們無私的付出與貢獻，讓我們更瞭解事實的真相，我們會竭盡所能將此結果，做為日後改善職傷勞工健康之依據，期望我們的微薄之力，能夠持續發揮正向的影響，讓世界日趨美好。

中文摘要



根據世界勞工組織估計，2010年約有313百萬名勞工發生需要離開工作至少4天以上的職業傷害，而在台灣每年平均亦有超過五萬名勞工發生職業傷害。過去研究發現勞工在職業傷害發生後的第三個月與第12個月，有部分勞工會產生自殺意念與精神疾病，而這些精神症狀也影響其復工情形。

過去的研究發現，在創傷事件發生後多年，有部分的人仍飽受精神症狀與自殺意念所苦，然而，目前鮮少有流行病學研究，對發生職業傷害的勞工進行長期追蹤調查，因此本研究目的，希望了解在職業傷害後多年，勞工們的精神疾病與自殺意念盛行率，以及其生活品質狀況，並且找出影響其精神健康與生活品質的因子。

在2009年，我們追蹤4,403位發生職業傷害的勞工，分別在他們發生職業傷害發生後第三個月與12個月，調查精神症狀與復工情形。本計畫預計追蹤過去曾經回覆過我們問卷的勞工，調查他們受傷後第六年的精神疾病與自殺意念盛行率，及生活品質。本研究將使用簡式健康表(Brief Symptom Rating Scale, BSRS-5)、創傷後症候群檢查表(Post-traumatic Symptoms Checklist, PTSC)、世衛組織生活品質問卷台灣簡明版(World Health Organization Quality of Life, WHOQOL-BREF)作為測量工具。對於精神症狀(BSRS-5或PTSC或有自殺意念)嚴重的個案，我們會使用中文版迷你國際神經精神會談工具(the Taiwanese version of the Mini-international Neuropsychiatric Interview, MINI)為其進行精神疾病與自殺傾向之診斷。本研究目的如下：

1. 推估勞工職業傷害後第六年精神疾病的盛行率、與探討影響其精神症狀之相關因子。
2. 推估勞工職業傷害後第六年自殺傾向的盛行率、與影響自殺意念的相關因子，並計算危害因子對自殺意念的可歸因風險(population attributable risk,

PAR)。

3. 探討勞工職業傷害後第六年的生活品質，以及影響其生活品質的相關因子。

此系列研究的重要發現如下:1) 與職業傷後害第三個月與第十二個月相比，勞工在受傷後第六年精神疾病盛行率較高，憂鬱症盛行率為9.2%，創傷壓力症候群與創傷後壓力症候群亞症候群7.2%，廣泛性焦慮症盛行率6.9%。影響精神狀況的相關因子為受傷嚴重度，再次發生需住院三天以上之職業傷害，失業，與職業傷後害工作不穩定。2) 與職業傷後害第三個月與第十二個月相比，勞工在受傷後第六年的自殺傾向盛行率較高，為10.2%。影響勞工自殺意念的相關因子為嚴重外觀受損，再次發生需住院三天以上之職業傷害，過去一年不穩定的工作狀態，與職業傷後害薪水減少；其可歸因風險分別為12.7%，4.9%，13.2%與19.0%。3) 職業傷害後重大生活事件，過去一年不穩定的工作狀態，與職業傷害後薪水減少，影響勞工受傷後第六年生活品質。

中文關鍵字：職業傷害;精神疾病;自殺意念;心理健康;生活品質

Abstract

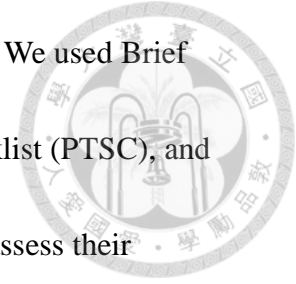


In 2010, the International Labour Organization (ILO) estimated that more than 313 million nonfatal occupational accidents (requiring at least 4 days of absence from work). In Taiwan, >50,000 workers suffer from occupational injury yearly, and 68% of them are hospitalized. Previous studies found that a certain proportion of workers reported having suicidal ideation and developed psychiatric disorders at 3 month and 12 months after occupational injury. Moreover, these psychological symptoms affected their return-to-work.

Several years after a traumatic event, some people still experience psychological symptoms and suicidality. However, literature on the long-term following up in workers with occupational injury is relatively lacking. Therefore, this study investigated the long-term prevalence of psychiatric disorders and suicidality after occupational injury, and their Health-related quality of life (HRQOL) at 6 years after occupational injury.

In Taiwan, a total of 4,403 workers were hospitalized for 3 days or longer and received occupational inpatient compensation from labor insurance between February 1 and August 31, 2009. We recruited them and followed up their psychological symptoms at 3 and 12 months. Those who completed the questionnaire at 3 or 12

months participated in a survey at 6 years after occupational injury. We used Brief Symptom Rating Scale (BSRS-5), Post-traumatic Symptoms Checklist (PTSC), and World Health Organization Quality of Life (WHOQOL-BREF) to assess their psychological symptoms and HRQOL. For Participants who reported severe psychological symptoms or having suicidal ideation, an in-depth psychiatric evaluation was performed using the Mini-international Neuropsychiatric Interview.



The purposes of this series of studies were to estimate the prevalence rates of psychiatric disorders and suicidality at 6 years after occupational injury and identify relative factors for poor psychological symptoms. In addition, we followed up occupationally injured workers to determine their HRQOL at 6 years after injury and to determine factors affecting each HRQOL domain.

The main findings of results were as follows: 1) the estimated rates of major depression and post-traumatic stress disorder (PTSD)/partial PTSD were 9.2% and 7.2%, respectively, and both these rates were higher at 6 years after injury than at 3 and 12 months after injury. Relevant factors for poor psychological health were severity of injury and instability of work. 2) the estimated MINI-diagnosed suicidality rates at 3 months, 12 months, and 6 years after occupational injury were 5.6%, 5.9%, and 10.2%, respectively. Injury majorly affecting the physical appearance, experienced additional occupational injury requiring hospitalization for >3 days,

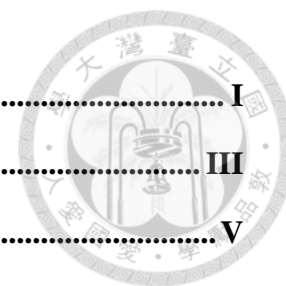
unstable employment, and having lower income than that before occupational injury were the most crucial factors. The adjusted PARs (aPARs) for these factors were 12.7%, 4.9% 13.2%, and 19.0%, respectively, for having suicidal ideation.³) Adverse life events and additional severe occupational injuries that occurred within the follow-up period, unstable employment, and decreased salary after the injury were significant factors for low scores in all domains of the WHOQOL-BREF.

Keywords: occupational injury; psychiatric disorders; suicidality; suicidal ideation;

WHOQOL-BREF

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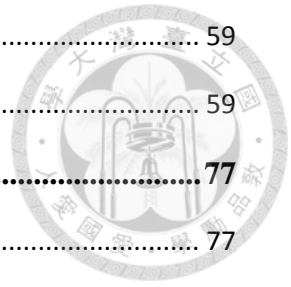
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Glossary



OI, Occupational injury

BSRS-5, the 5-item Brief Symptom Rating Scale

MINI, the Mini-International Neuropsychiatric Interview

PTSD, Post post-traumatic stress disorder (PTSD)

PPTSD, Partial Post post-traumatic stress disorder

HRQOL, Health-related quality of life

WHOQOL, the World Health Organization Quality of Life

Chapter 1 Introduction



Of the 3 billion workers worldwide, more than 317 million workers are estimated to be absent from work for longer than 3 days because of the occurrence of injury at work ¹. This equates to an average of 850,000 workers being injured every day. After occupational injury (OI), a certain proportions of workers develop suicidal ideation ². Moreover, a percentage of injured workers develop mental disorders within 2 years of the injury ³⁻⁶. In addition, those with poorer psychological conditions had a poorer opportunity to return to work ⁷, and those who with a disability of the upper or lower extremity tended to have higher mortality from self-harm in later life than did the general population ⁸. In cases of severe injury, a proportion of workers spent the rest of their life suffering from psychological ailments.

Because post-traumatic stress disorder (PTSD) and major depression are the most commonly reported psychiatric disorders after a traumatic event ⁹⁻¹², these conditions are more frequently studied in injured workers, and other conditions are less investigated. In addition, injury ¹³ and mental disorders ^{14,15} are risk factors for suicidality. A previous study found that 8.3% of workers exhibit suicidal ideation within 1 year after OI ². However, longer term follow-up studies of suicidality after OI have been relatively lacking despite the finding that the consequences of OI may

persist for many years¹⁶⁻¹⁹.



Health-related quality of life (HRQOL) is recognized as a measurement of the health status of individuals that is influenced by a person's experiences, beliefs, expectations, and perceptions^{20,21}. HRQOL has been used to assess how disease impairs a person's subjective well-being across a wide range of areas²². Many years after traumatic injury, injured patients had lower quality of life (QOL) scores than did the normal population^{23,24}. Occupational injury not only affects workers' mental health, but also impacts on their employment and family life^{16,19}. However, documentation of the QOL impact among injured workers years after injuries is crucial.

Therefore, the current study followed up occupationally injured workers' psychiatric conditions and health-related quality of life at 6 years after occupational injury. The objectives of this doctoral dissertation were:

1. To determine the prevalence rates of depressive, anxiety, and PTSDs and identified the predictive factors for related psychological symptoms at 6 years after occupational injury.
2. To estimate the prevalence rate of suicidality at different time points of follow-up and determine the risk factors for suicidal ideation at 6 years after injury.
3. To determine occupationally injured workers' HRQOL at 6 years after injury and to

determine factors affecting each HRQOL domain



Chapter 2 Literature Review



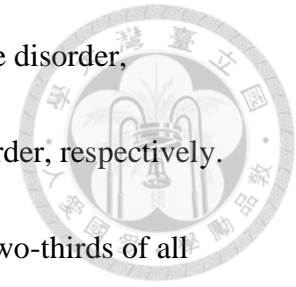
A. The prevalence rates of psychiatric disorders after OI

Larsson and Bjömsting followed up on injured workers at 5 years after injury and reported that the prevalence rates of depression were 3%–12% depending on the degree of impairment ²⁵. Dong and coworkers used a questionnaire to assess the long-term psychological outcomes among construction workers who sustained occupational injuries and revealed that the prevalence rates of depression, emotional problems, and physician-diagnosed psychiatric conditions were 17.0%, 12.3%, and 6.3%, respectively ¹⁸. Because post-traumatic stress disorder (PTSD) and major depression are the most commonly reported psychiatric disorders after a traumatic event ⁹⁻¹², these conditions are more frequently studied in injured workers, and other conditions are less investigated.

B. The risk factors for suicidality

Suicide is the fourteenth leading cause of death, accounting for 1.4% of all deaths worldwide ²⁶. More than 800,000 people have completed suicide every year, and more than half of this population are aged between 15 and 44 years ²⁷. Mental disorders are a risk factor for suicide ^{14,15}. The pooled relative risks (RRs) for suicide

are estimated to be 19.9, 12.6, 7.6, 5.7, and 2.7 for major depressive disorder, schizophrenia, anorexia nervosa, bipolar disorder, and anxiety disorder, respectively. Overall, mental disorders and substance abuse are responsible for two-thirds of all suicides in China, India, and Taiwan ²⁸. Other identified risk factors include having a lower education level, being unmarried, having lower social support, and experiencing recent or long-term negative life events, such as financial problems and serious physical problems ^{29,30}.



C. Suicidality after OI

Suicidality covers a broad range of conditions including suicidal ideation, suicide plans, suicide attempts, and completed suicide. The first three conditions can be considered warning signs for completed suicide ^{31,32}. Injury contributes to suicidality ¹³. A previous study found that 8.3%–11.0% of workers exhibit suicidal ideation within 1 year after OI ². However, longer term follow-up studies of suicidality after OI have been relatively lacking despite the finding that the consequences of OI may persist for many years ^{18,19}.

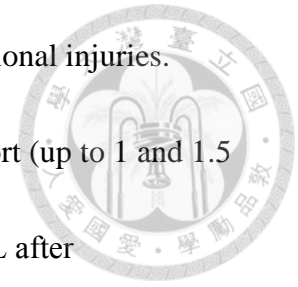
D. Health related quality of life after OI

HRQOL after occupational injury has been less studied and is insufficiently understood. Investigations in Egypt ³³, Iran ³⁴, and the USA ³⁵ found reduced HRQOL,

especially in the physical components ³⁵ among those with occupational injuries.

However, the follow-up periods of these studies were relatively short (up to 1 and 1.5 years after injury). Longer term follow-up studies on workers' QOL after

occupational injury remain lacking.



Chapter 3 Materials and Methods



From February to August 2009, 4,403 workers sustained occupational injury and were hospitalized for 3 days or longer in Taiwan. Two surveys on psychiatric conditions were conducted at 3 and 12 months after occupational injury, and 2,308 workers responded to either survey. They were followed up at 6 years after occupational injury and were mailed a self-reported questionnaire survey.

The study and design framework were shown in figure 1 and 2. The detailed description of each study will describe in next subsections

A. Part I

A.1.1 Study subjects

This study investigated the consequences of occupational injuries. Of 4,403 workers who were hospitalized for 3 days or longer and who received occupational inpatient compensation from labor insurance between February 01 and August 31, 2009, 2,308 completed the questionnaire at 3 and/or 12 months after injury. Among these 2,308 injured workers, 18 were deceased and 575 were unreachable because of changes in address and/or phone number, leaving 1,715 workers eligible for the study. This study was approved by the Research and Ethical Committee of National Taiwan

University Medical Center and complied with the principles outlined in the Declaration of Helsinki. Only those who consented to the study were administered the questionnaire survey. Oral informed consent was obtained before each MINI.



A.1.2 Procedure

A two-stage survey was performed as described in previous reports^{3,4}. The first stage involved a self-administered questionnaire comprising items on demographics, work instability, and psychological symptoms from the five-item Brief Symptom Rating Scale (BSRS-5) and the Post-traumatic Symptom Checklist (PTSC). Six years after the injury, this questionnaire was posted to the subjects' addresses. If any incomplete questionnaires were returned, a phone interview was conducted to obtain responses for all unanswered questions. Participants were eligible for the second-stage phone interview if (1) their total BSRS-5 score was ≥ 6 , (2) any of their PTSC items were scored as "severe" or higher, or (3) any two of their PTSC items were scored as "moderate" or higher. Psychiatrists or trained nurses invited candidates for the second-stage phone interview, and once they consented, the phone interview was scheduled within 4 weeks of their returning the questionnaire. The Taiwanese version of the Mini-international Neuropsychiatric Interview (MINI) was used for the phone interview. In this study, one psychiatrist and two registered nurses trained by a senior psychiatrist conducted the MINI. If the interviewers encountered any uncertainty, the

senior psychiatrist was consulted for the final diagnosis.



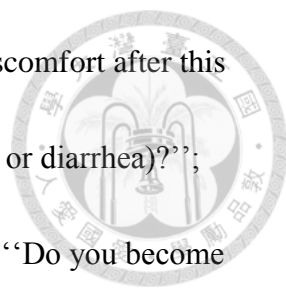
A.1.3 Measurements

BSRS-5 (5-item brief symptom rating scale)

The BSRS-5 is derived from the Symptom Checklist-90-revised (SCL-90R) and the 50-item BSRS (BSRS-50). It comprises five items and measures the following psychopathologies: feeling tense (anxiety), feeling blue (depression), being easily annoyed or irritated (hostility), feeling inferior to others (interpersonal sensitivity), and having trouble falling asleep (insomnia). Each item was scored on a five-point scale as follows: 0 (not at all), 1 (a little bit), 2 (moderate), 3 (quite a bit), and 4 (extremely). Total scores ranged from 0 to 20, with higher scores indicating more severe psychological symptoms, and the best cutoff point of BSRS-5 scores for identifying psychiatric disorders was set at ≥ 6 ³⁶. The validity and reproducibility of this scale had previously been examined with good internal consistency and test–retest reliability in people from Taiwan^{36,37}.

Post traumatic symptom checklist (PTSC)

The PTSC is a 3-item checklist for the rapid screening of PTSD symptoms experienced in the previous 1 week, with assessed symptoms corresponding to the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) symptom clusters of PTSD, namely re-experiencing, numbness, and hyperarousal³⁸. These

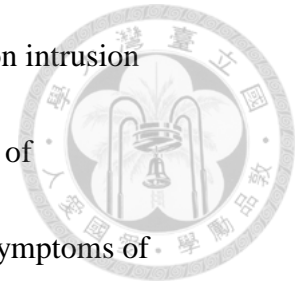


items are as follows: “Have you been encountering any physical discomfort after this event (including sweating, tremors, racing heart, tachypnea, nausea, or diarrhea)?”; “Have you been unable to feel sad or happy after this event?”; and “Do you become easily startled after this event?” In this study, “this event” referred to the occupational injury in 2009. The response to each item was rated on a five-point Likert scale as follows: 0 (no), 1 (mild), 2 (moderate), 3 (severe), and 4 (very severe). The internal consistency of the PTSC, as measured by Cronbach’s alpha, was 0.78, with a sensitivity of 89.5 % and a specificity of 98.8 %³.

The Taiwanese version of the MINI

Sheehan et al. developed MINI according to DSM-IV symptoms³⁹. The Taiwanese Society of Psychiatry subsequently developed a Taiwanese version of the MINI (from the English version of the MINI 5.0), which is widely used among the Taiwan community^{36,40}. In this study, we only surveyed 16 Axis I diagnoses, partial PTSD (PPTSD), and suicidality. The 16 Axis I diagnoses were major depression, dysthymia, manic episode, hypomanic episode, panic disorder, agoraphobia, social phobia, obsessive–compulsive disorder, PTSD, alcohol dependence, alcohol abuse, substance dependence, substance abuse, anorexia nervosa, bulimia nervosa, and generalized anxiety disorder. The PTSD module was used to identify the cases of PPTSD, the details of which are reported elsewhere⁴¹. The criteria for diagnosing

PTSD were defined as follows: (1) a positive response to the item on intrusion symptoms, (2) positive responses for at least three of six symptoms of avoidance/numbing, (3) positive responses for at least two of five symptoms of hyperarousal, and (4) the presence of distress and impairment. Participants who did not meet these criteria for PTSD but who endorsed the presence of a combination of two of the three clusters (intrusion, avoidance/numbing, or hyperarousal) and endorsed distress or impairment, were considered to have PPTSD^{3,4}.



Severity indicators of injury

Data regarding the duration of hospital stay (days) immediately after the occupational injury in 2009 and whether the injury affected physical appearance (“none,” “mild,” or “severe”) were obtained mainly from the questionnaire survey at 3 and 12 months after injury, respectively.

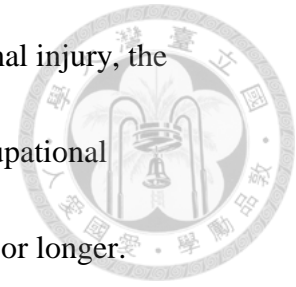
Current work status and instability of work

In the survey, the participants were asked “Do you currently have a job?” to investigate the employment status and “How many different companies have you worked for since 2009?” to estimate the work instability after the injury.

Family and social factors

Covariates included participants’ age, sex, marital status, education level, experience of major adverse life events (such as divorce, illness, litigation, and

bankruptcy) during the 6-year follow-up period after the occupational injury, the presence of family members requiring care, and the number of occupational injury-related hospitalizations since 2009 that had lasted for 3 days or longer.



A.1.4 Statistical analysis

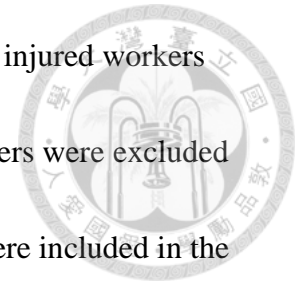
Descriptive statistics were used to analyze the distribution of the covariates and psychological symptoms and to estimate the prevalence rate of psychiatric disorders among participants. The prevalence rates of psychiatric disorders at 6 years after occupational injury were estimated by multiplying the percentage of the high scores in BSRS-5 or PTSC by the percentage of participants diagnosed as having psychiatric disorders through the MINI. A linear regression model was used to determine the factors contributing to the BSRS-5 and PTSC scores. JMP 10.0 was used for data analyses⁴².

B. Part II

B.1.1 Study subjects

In Taiwan, a total of 4,403 workers were hospitalized for 3 days or longer and received occupational inpatient compensation from labor insurance between February 1 and August 31, 2009. We recruited them and followed up their psychological symptoms at 3 and 12 months. Those who completed the questionnaire at 3 or 12

months participated in a survey at 6 years after OI. A total of 2,308 injured workers completed the questionnaire at 3 or 12 months. A total of 593 workers were excluded because they were deceased or unreachable; thus, 1,715 workers were included in the survey at 6 years.



This study was approved by the Research and Ethical Committee (REC) of the National Taiwan University Medical Center. Only workers who consented to participate in the study completed the questionnaire survey. Oral informed consent was also obtained before each MINI interview.

B.1.2 Procedure

Each survey was divided into two stages. In the first stage, a self-administered questionnaire was mailed to the workers to investigate their demographics, work instability, injury severity, and suicidal ideation. Those who reported having suicide ideation or those who had high scores on the 5-item Brief Symptom Rating Scale (BSRS-5) in the first stage were candidates for the second-stage phone interview. Psychiatrists or trained nurses used the Taiwanese version of MINI to conduct the second-stage phone interview with the candidates; once the candidates had provided oral consent, the phone interview was arranged within 4 weeks after they returned the questionnaire.



B.1.3 Measurements

Individual characteristics

At 3 months, 12 months, and 6 years, we assessed the workers' age, sex, marital status, education level, adverse life events within the follow-up period (divorce, personal and family illness, traffic accident, litigation, and bankruptcy), and work status at the time of the questionnaire survey.

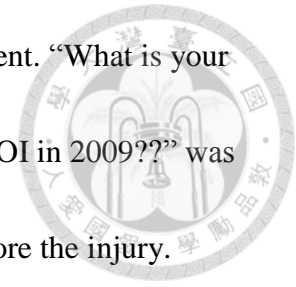
Injury severity

The following severity indicators of OI were assessed at 3 and 12 months: (1) the length of hospital stay (days) immediately after the injury and (2) whether the injury affected physical appearance (none, mild, or severe). At 6 years, the length of hospital stay (days) immediately after the injury occurring in 2009 was obtained mainly from the questionnaire administered at 3 months after the injury. Moreover, whether the injury affected the physical appearance was obtained mainly from the questionnaire administered at 12 months after the injury.

Work-related data at 6 years after occupational injury

Whether the workers experienced additional OIs requiring hospitalization for longer than 3 days was assessed at 6 years. "What kind of work contract have you had for the past one year?" was used to determine long-term work stability. Long-term fulltime employment was categorized as stable employment, and short-term, part-time,

and temporary employment were categorized as unstable employment. “What is your current monthly income as a percentage of your income before the OI in 2009??” was also used to assess the income after OI in comparison with that before the injury.



Reduced income was defined as a current monthly income less than that before OI.

BSRS-5 (5-item brief symptom rating scale)

BSRS-5 is a five items and self-reported questionnaire. It was derived from the symptom checklist-90-Revised (SCL-90R) and the 50-item brief symptom rating scale (BSRS-50). The full scale contained the following psychopathology: feeling tense (anxiety), blue (depression), easily annoyed or irritated (hostility), inferior to others (interpersonal sensitivity), and trouble falling asleep (insomnia). Each item was a five-point scale as follows: 0, not at all; 1, a little bit; 2, moderately; 3, quite a bit; 4, extremely. Total score range from 0-20, with higher scores indicating severer psychological symptoms and the best cut-off point of BSRS-5 to identify psychiatric cases was set at greater or equal to 6³⁶. The validity and reproducibility of the BSRS-5 were previously examined for Taiwanese people. The internal consistency coefficients of the BSRS-5 ranged from 0.77 to 0.99. The test–retest reliability coefficient was 0.82, and the rate of accurate classification of the BSRS-5 ranged from 76.3% to 82.6% when the cutoff point was 5/6^{36,37}. BSRS-5 has been used as a screening instrument for suicidal ideation among different populations in Taiwan⁴³⁻⁴⁵.

Suicidal ideation

The question “Do you have thoughts of ending your life?” in the BSRS-50⁴⁶ was used to assess suicidal ideation. The item was rated on the aforementioned 5-point scale. Workers who scored more than 0 were defined as having suicidal ideation. The item was added at the end of BSRS-5 and was applied in previous surveys⁴³⁻⁴⁵.

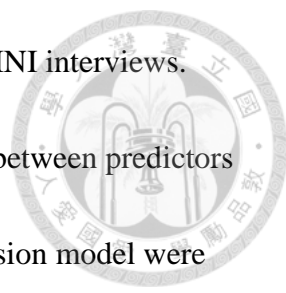
The Taiwanese version of MINI

In this study, we used the suicide module of MINI^{39,47} to assess the prevalence rate of suicidality in the past month. This module uses specific questions to assess suicidal ideation, suicide plans, and suicide attempts within the past month and lifetime suicide attempts. The Taiwanese version of MINI, which was developed by the Taiwanese Society of Psychiatry according to the English version of MINI 5.0, is widely used in Taiwan^{40,48,49}. The suicide module of MINI has been documented as a valid screening tool for the risk of suicidality⁵⁰.

B.1.4 Statistical analyses

Descriptive statistics were used to analyze the distribution of the covariates and suicidal ideation and to estimate the prevalence rate of suicidality in the past month among participants. The prevalence rates of suicidality at 6 years after OI were estimated by multiplying the percentage of the percentage of the high scores in BSRS-5 or having suicidal ideation by the percentage of workers with

MINI-diagnosed suicidality among those who participated in the MINI interviews.



Logistic regression was performed to examine the association between predictors and suicidal ideation. The significant variables in the logistic regression model were included in the multiple logistical regression model. In the aforementioned models, we the calculated 95% confidence intervals (CIs) for odds ratios (ORs). CIs that did not include 1.0 were considered statistically significant. In addition, the Poisson log-linear regression model was performed to calculate the risk ratios (RRs), and the adjusted RR (aRR) was calculated after adjusting for significant variables. Population attributable risks (PARs) were calculated to determine the proportion of workers with suicidal ideation that would be prevented if the risk factors were absent. The following expression was adapted for PAR calculation: [(Incidence in the total population) – (Incidence in the non-exposed group)/Incidence in the total population]

⁴⁰. JMP 10.0 was used as an overall statistical package for data analyses ⁴².

C. Part III

C.1.1 Study subjects

In our previous study, we had recruited workers who had been hospitalized for days or longer because of occupational injuries between February 01 and August 31, 2009. A structured questionnaire survey was performed at 3 and 12 months after the

injury. A total of 2,308 participants completed either survey^{3,51}. Those participants are the candidates of this study. This study was approved by the Research and Ethical Committee (NTUH-REC No.: 201401075RINB) of the National Taiwan University Medical Center. Only those who consented to participation in the study were invited to complete the questionnaire survey.




C.1.2 Procedure

At 6 years after injury, the candidates of this study were invited to participate in the questionnaire survey. A self-reported questionnaire that comprised items on patients' demographics, employment status, and quality of life was posted to the homes of all the participants. If a participant did not respond to the questionnaire, they were contacted via telephone and invited to participate in the study. Three attempts were made at different times of the day. If a questionnaire was incompletely answered, a phone interview was performed to obtain complete responses.

C.1.3 Measurements

Demographic variables

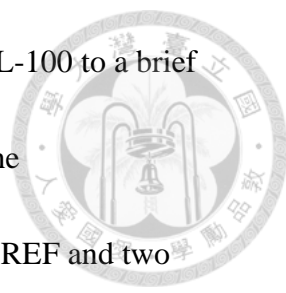
We collected the patients' sociodemographic data, including information on age, sex, marital status, education level, and whether any family members required care. Severity indicators for the injury event were (1) the length of hospital stay (in days)



immediately after the occupational injury in 2009 and (2) whether the injury affected physical appearance (“none,” “mild,” or “severe”); these data were obtained from previous surveys. In addition, the questionnaire enquired whether the participant had experienced additional occupational injuries requiring hospitalization for >3 days and whether the participant had experienced any major adverse life events (such as divorce, illness, litigation, death of a family member, and bankruptcy) during the 6-year follow-up period. To determine job stability, the following question was asked: “What kind of work contract have you had for the past 1 year?” Long-term fulltime employment was categorized as stable employment and short-term or part-time employment and temporary jobs as unstable employment. The income related to employment was assessed by asking “What percentage best describes your current monthly salary compared with your salary before the occupational injury in 2009?” Potential answers ranged from 10% up to 100%, and >100%. Reduced salary was defined as a current monthly salary that was <100% of that before the occupational injury.

The Taiwanese version of the World Health Organization QOL scale-abbreviated version

In 1991, the World Health Organization (WHO) initiated a project to develop an international QOL instrument that included 100-items (WHOQOL-100)²⁰.



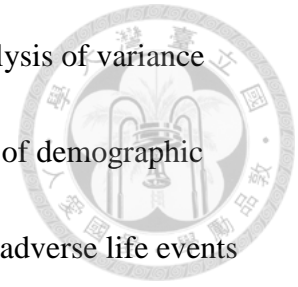
Subsequently, a WHOQOL research group simplified the WHOQOL-100 to a brief version called the WHOQOL-BREF⁵². The Taiwanese version of the WHOQOL-BREF contains 26 items from the original WHOQOL-BREF and two Taiwanese national items⁵³. The 26-item WHOQOL-BREF comprised two generic items (overall quality of life and general health), and the remaining 24 items were further categorized into four domains: physical (seven items), psychological (six items), social relationships (three items), and environment (eight items). The two Taiwanese national items (i.e., being respected by others and being able to get the things you like to eat) were classified into the social relationships and environment domains, respectively. Respondents rated the intensity, frequency, or evaluation of the selected attributes of QOL during the previous 2 weeks on a 5-point Likert response scale. The two generic items were rated as a single score (range, 1–5). Each domain score ranged from 4 to 20 and was calculated by multiplying the average score of all items in the respective domain by 4, with higher scores indicating better QOL in the corresponding domain. The Taiwanese version of the WHOQOL-BREF has been widely used in Taiwan⁵⁴⁻⁵⁶.

C.1.4 Statistical analysis

All data were entered and analyzed using the JMP 10 statistical package⁴².

Descriptive statistics were used to analyze the distribution of the covariates and the

mean scores of the four QOL domains. The student's t-test and analysis of variance (ANOVA) were used to determine the differences among categories of demographic variables. Significant potential confounders, namely marital status, adverse life events within the follow-up period, the presence of family members requiring care, additional occupational injuries, injury severity, and employment status, were included in a multiple linear regression model to evaluate their association with the primary effects of interest (i.e., the scores of the four QOL domains). All tests were two-sided, and the differences were considered statistically significant at $p < 0.05$.



Chapter 4 Results

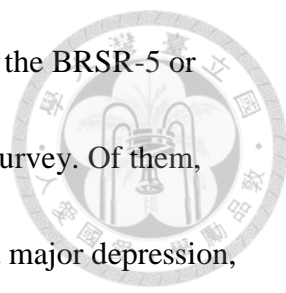


A. Part I

One-third (33.5%, 574/1,715) of the recruited participants satisfactorily completed this study. The scheme of participant recruitment is shown in Figure 1.

The average participant age was 47.7 years [standard deviation (SD) = 11.1], and a majority of these participants were male (67.4 %). Most were married (69.3 %) and had an education level of high school or above (73.5 %). Two-thirds of the participants had experienced major adverse life events within the follow-up period, and 26.7% had a family member requiring care. The average hospital stay immediately after injury was 9.4 days (SD = 10.7) in 2009, and 21.0 % of injuries had a major impact on the workers' physical appearance. In addition, 13% of the participants subsequently experienced another occupational accident(s) requiring hospitalization for 3 days or longer. More than one-third of the workers had to quit their job at least once after the injury, 7.5% retired, and another 7.5% were unemployed (Table 1).

Two-fifths of the participants scored 6 or higher on the BSRS-5, and "insomnia" was the most frequently reported psychological symptom. "Becoming easily startled" was the most commonly reported symptom in the 17.5 % who met the PTSC criteria



(Table 2). A total of 243 (42.6 %) participants scored high on either the BSRS-5 or PTSC and were candidates for the MINI in the second stage of the survey. Of them, 135 (55.5 %) completed the MINI, and approximately one-third had major depression, one-sixth had PTSD or PPTSD, and one-sixth had generalized anxiety disorder (Table 3). Among the 108 workers who did not complete the MINI, 56 could not be reached over phone after at least three attempts, 50 refused to participate, and two become irritable and could not continue the interview because it triggered negative emotions in them. Those who completed and those who did not complete the MINI had similar BSRS-5 and PTSC scores.

Because 42.6 % of the injured workers scored high in the BSRS-5/PTSC screening, the estimated rates of current major depression, PTSD or PPTSD, and generalized anxiety disorder of the 570 injured workers were 9.2%, 7.2%, and 6.9%, respectively (Table 3).

Table 4 shows the risk factors for high BSRS-5 and PTSC scores. After adjustment for family and social factors, longer hospital stay immediately after injury, affected physical appearance, and current unemployment were significantly related to the BSRS-5 and PTSC scores at 6 years after occupational injury (Table 4). In addition, work instability was related to high BSRS-5 scores.

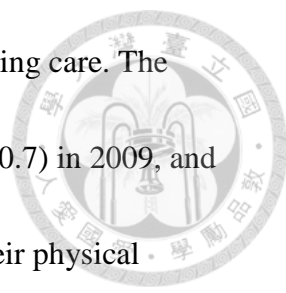


B. Part II

The participants' recruitment and the prevalence rate of suicidal ideation at 3 and 12 months after OI are described in a previous study ². Briefly, of the 4,403 injured workers requiring hospitalization for longer than 3 days, 2,001 and 1,233 workers participated in the surveys at 3 and 12 months after OI. Only those who completed either the 3- or 12-month survey (n = 1,715) were included in the 6-year survey. Suicidal ideation was reported by 8.3%, 11.0%, and 16.5% of participants at 3 months, 12 months, and 6 years after OI, respectively. A BSRS-5 score of 6 or higher was found in 28.8%, 24.6%, and 40.0% of participants at 3 months, 12 months, and 6 years after the injury, respectively. These participants were the candidates of the second stage of the survey involving the MINI phone interview (Table 5).

Table 6 depicts the estimated MINI-diagnosed suicidality rates at different stages of the survey. The estimated MINI-diagnosed suicidality rates were 5.6%, 5.9%, and 10.2% at 3, 12 months, and 6 years after OI, respectively (Table 6).

Table 7 depicts the potential risk factors and their crude ORs for suicidal ideation among workers who participated in the 6-year survey. The average age was 47.7 years [standard deviation (SD) =11.1], and the majority of the participants were men (67.4%). Most of the participants were married (69.3%) and had an education level of high school or above (73.5%). Two-thirds experienced a major adverse life event



within the follow-up period, and 26.7% had a family member requiring care. The average hospital stay immediately after injury was 9.4 days (SD = 10.7) in 2009, and among 21.0% of the participants, the injury had majorly affected their physical appearance. In addition, 13% of the participants experienced additional occupational accident(s) requiring hospitalization for longer than 3 days. Approximately 30% of the workers had unstable employment within 1 year before the questionnaire survey, and 37% had lower income in the past 1 year than that before OI. At 6 years after the injury, elevated ORs for suicidal ideation were found for workers who experienced an adverse life event within the follow-up period, had a family member requiring care, reported that the injury majorly affected their physical appearance, experienced additional OI requiring hospitalization for longer than 3 days, had an unstable employment contract, or had lower income in the past 1 year than that before OI.

All significant variables in Table 3 were included in the mutually adjusted model for estimation of RRs and PARs for suicidal ideation (Table 8). After adjustment for potential variables, the following factors were significant: reporting that the injury majorly affected the physical appearance, experiencing additional OI requiring hospitalization for longer than 3 days, having an unstable employment contract, and having lower income in the past 1 year than that before OI. The adjusted PARs (aPARs) for each factor were 12.7, 4.9, 13.2, and 19.0, respectively.

C. Part III



At 6 years after occupational injury in 2009, 18 workers had died and 575 could not be reached because of a changed address and/or phone number. A total of 1,715 participants were candidates for this study. Among them, 574 returned the questionnaire, but only 563 (32.8%) completed it satisfactorily. The scheme of candidate recruitment is shown in Figure 2.

Table 1 shows the data regarding demographics and injury-related conditions of the participants. Their mean age was 47.6 years, and 67.3 % were male. Most participants were married (69.4 %) and had an education level of high school or above (73.7 %). Two-thirds of the participants had experienced adverse life events within the follow-up period, and 26.6% had a family member requiring care. Regarding the severity of the occupational injury in 2009, 38.0% of injured workers were hospitalized for ≥ 8 days immediately after the injury, and 21.0% of the injured workers believed that the injury had a major effect on their physical appearance. Approximately 13% of our participants subsequently experienced additional occupational accidents requiring hospitalization for >3 days. Regarding workers' employment status in the year before the questionnaire survey was performed, 5.7% of the participants had retired, and 28.4% had unstable employment. In the past year, $>35\%$ of workers had a lower average salary than that before the injury in 2009

(Table 9).

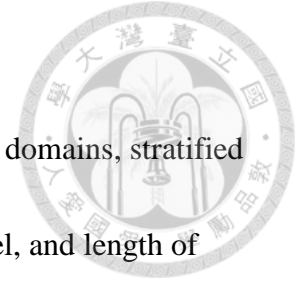
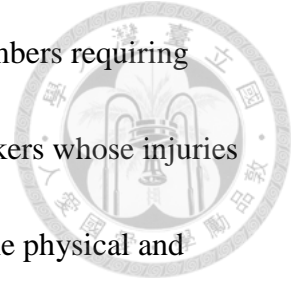


Table 10 shows the mean scores of the four WHOQOL-BREF domains, stratified by demographic and injury-related factors. Age, sex, education level, and length of hospital stay immediately after occupational injury did not have a significant effect on any of the WHOQOL-BREF domains. Unmarried individuals scored lower in the social domain. Workers who had a family member requiring care had lower scores in the physical, psychological, and environment domains. Participants who experienced additional occupational injuries requiring hospitalization for >3 days had lower scores in each domain. Workers who reported a major change in appearance because of the injury had lower scores in all four domains than did those with no or minor changes in appearance. Compared with workers with stable employment contracts, injured workers with unstable employment contracts during the past year had significant lower scores in all four domains. Moreover, workers with salaries lower than those before the injury had lower scores in all four domains.

The significant demographic characteristics and injury-related factors were included in the multiple regression models (Table 11). The mutually adjusted model revealed that adverse life events within the follow-up period, unstable employment, and decreased salary after the injury were significantly associated with low scores in all the WHOQOL-BREF domains. In addition, unmarried participants had a low score

in the social relationships domain. Participants who had family members requiring care had low scores in the physical and environment domains. Workers whose injuries had a major effect on their physical appearance had low scores in the physical and psychological domains.



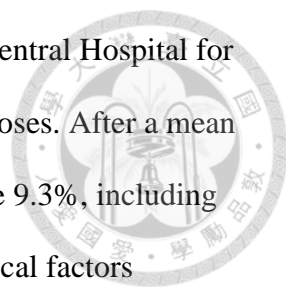
Chapter 5 Discussions



A. Log-term prevalence rates of psychiatric diseases among workers after OI

This is the first study that investigated long-term psychiatric disorders after occupational injuries by using diagnostic tools such as MINI. Major depression (9.2%), PTSD/PPTSD (7.2%), and general anxiety disorder (6.9%) were even more prevalent at 6 years after occupational injury than at 3 months and 12 months after injury (major depression and PTSD/PPTSD prevalence rates were 3.0% and 6.8% at 3 months and 2.0% and 5.1% at 12 months, respectively). These results suggest that the psychiatric conditions do not improve with time and remain an important cause of morbidity after occupational injuries.

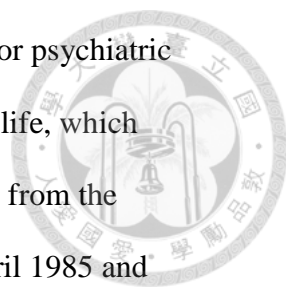
Traumatic injuries are known to have long-term psychological consequences. PTSD and depression are most commonly reported from months to years after a traumatic injury. In Switzerland, Hepp and coworkers followed 90 patients from the Department of Traumatology at Zurich University Hospital who had serious accidental injuries. Among these patients, 4.4% suffered from PTSD and 10.0% from subsyndromal PTSD at 3 years after the accident ⁹. The reported study reported lower prevalence rates for these conditions, likely because of a longer follow-up period of 6 years. In the United Kingdom, Mayou and coworkers followed 111 nonhead-injured motor vehicle accident victims and reported that 8% and 9% of them suffered from PTSD and minor PTSD at 5 years after the accident ¹⁰. In Norway, Sigurdardottir et al. followed 89 individuals with mild-to-severe traumatic brain injury who were admitted to the Trauma Referral Center. At 5 years after injury, 18% had depression, as assessed through the self-administered Hospital Anxiety and Depression Scale ¹¹. In



Norway, Malt assessed 107 injured patients admitted to Akershus Central Hospital for less than 7 days, according to DSM-III criteria for psychiatric diagnoses. After a mean period of 2.3 years, the incidence rates of nonorganic disorders were 9.3%, including anxiety disorder (3.7%), dysthymic disorder (2.8%), and psychological factors affecting the physical condition (2.8%)¹². In Australia, 1,167 injured patients who were hospitalized for 24 h or longer were followed up for mental conditions at 3, 12, and 72 months after injury. The prevalence rates of PTSD, major depression, and generalized anxiety disorder were 7.7%, 11.5%, and 5.9%, respectively, at 72 months after injury. Notably, despite a decreasing trend in the occurrence of psychiatric disorders with the time after injury, the occurrence of new psychiatric disorders was observed at 12 months (9%) and 72 months (7%) after injury⁵⁷.

Few investigations have reported long-term psychiatric outcomes after occupational injuries. In Sweden, Larsson and Bjömsting followed injured workers at 5 years after injury and reported that the prevalence rates of depression were 3%–12%, depending on the degree of impairment²⁵. Long-term psychological health outcomes were assessed using self-administered questionnaires among US construction workers who sustained occupational injuries and lost any workdays. At an average of 10 years after injury, the questionnaire detected depression, emotional problems, and physician-diagnosed psychiatric conditions in 17.0%, 12.3%, and 6.3% of the injured workers¹⁸. The present study also reported a comparable prevalence rate of depression. In addition, the rates of PTSD and PPTSD, as well as those of other psychiatric morbidities, remained relatively high among the injured workers.

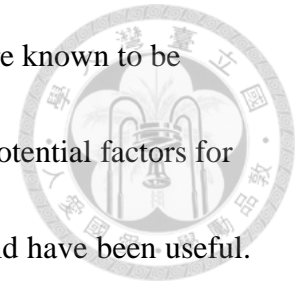
The general population commonly believes that time might cure psychological trauma. However, in US workers with occupational injuries, the proportion of depression increased with the time after injury⁵. The author considered that occupational injury not only affected the health and appearance but also the



employment opportunities of workers. Potential explanations for poor psychiatric outcomes included a decreased socioeconomic status and quality of life, which persisted for several years after the injury. Among Swedish workers from the township of Umeå who sustained occupational injuries between April 1985 and March 1986, 23% suffered from persistent medical problems at 5 years after occupational injury. In addition, workers with a higher degree of impairment had a higher proportion of depression ²⁵. In Maryland, United States, among the 537 workers' compensation claimants who responded to a survey at 1–4 years post-claim, 28% were out of work at the time of survey. Almost a half of the respondents reported financial and family problems as a result of the injury. Furthermore, those who were unemployed had a higher risk of depression symptoms ¹⁶.

In the present study, the prevalence rates of major depression and PTSD/PPTSD were re-elevated at 6 years after occupational injury. This finding contradicts the general belief that psychological trauma recovers with time ⁵⁸⁻⁶². Literature regarding such an observed rebound in psychiatric conditions after injury is lacking. To further confirm our observation of the re-elevation of psychiatric conditions, we examined the BSRS-5 scores among those who answered all three surveys, namely, at 3 months, 12 months, and 6 years after injury. A total of 298 participants completed all three surveys, and the proportions of participants with elevated BSRS-5 scores (≥ 6) were 28.9%, 26.2%, and 37.9% at the three time points (data not shown). These findings support the observation of the re-emergence of psychiatric conditions in our participants. In addition to economic challenges such as unemployment ⁶³,

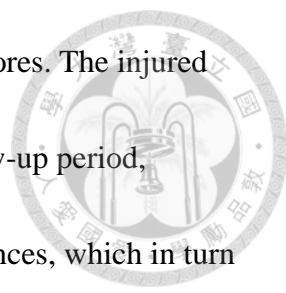
characteristics such as low income⁶⁴ and poor quality of life^{65,66} are known to be associated with poor psychological health. A comparison of these potential factors for psychiatric conditions between injured and uninjured workers would have been useful.



However, we did not have uninjured workers in our cohort. Therefore, we performed comparisons among participants with different degrees of affected physical appearance, which was used as an indicator of the severity of injury. Moreover, workers who reported that the injury severely affected their physical appearance had significantly higher proportions of unemployment and reduced income and lower scores of health-related quality of life than did workers who experienced less severe injuries (data not shown). Occupational injuries may have affected the workers' employment opportunities, financial status, and health-related quality of life and may have caused the re-emergence of psychiatric conditions several years after the injury, especially when the workers' compensation was ceased.

B. The risk factors for psychological symptoms at 6 years after OI

This study also identified several risk factors for both high BSRS-5 scores and severe PTSC. These factors have previously been associated with poor psychological health⁶⁷⁻⁷¹: (1) major adverse life event(s) during the follow-up period, (2) family member(s) requiring care, (3) longer hospital stay immediately after injury, (4) physical appearance affected by injury, and (5) current unemployment (Table 4). In



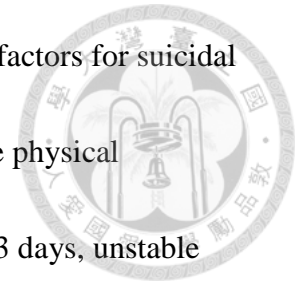
addition, work instability was associated with increased BSRS-5 scores. The injured workers had worked for many different companies within the follow-up period, implying that they were exposed to precarious employment experiences, which in turn encompassed job insecurity, low income, and economic deprivation^{72,73}. These experiences represented potential psychological health risks⁷⁴⁻⁷⁷. Financial difficulties and relative social deprivation were among the most severe consequences of precarious employment, and they may have caused poor psychological health⁷³. In addition, the influence of psychiatric history from before the occupational injury in 2009 could be a factor for psychological symptoms after the injury. Psychiatric history from before the injury was assessed at both 3 and 12 months after injury, and only 2.6% of the participants (n = 15) had a psychiatric history before the injury (data not shown). The BSRS-5 and PTSC scores at 6 years after injury were compared between those with and without a psychiatric history, but no significant differences were identified.

C. Long-term suicidality after OI by using a structured clinical interview

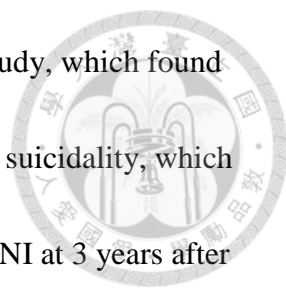
This study was the first to investigate long-term suicidality after OI by using a structured clinical interview. The estimated MINI-diagnosed suicidality rates were 5.6%, 5.9%, and 10.2% at 3 months, 12 months, and 6 years after OI, respectively.

These results suggested that suicidality does not improve with time but remains a vital

issue after OI. In addition, the current study also identified the risk factors for suicidal ideation at 6 years after OI, namely, the injury majorly affecting the physical appearance, additional OI requiring hospitalization for longer than 3 days, unstable employment, and reduced income after injury. According to the PAR estimation, the contributions of these factors to suicidal ideation were 12.7%, 4.9%, 13.2%, and 19.0%, respectively.



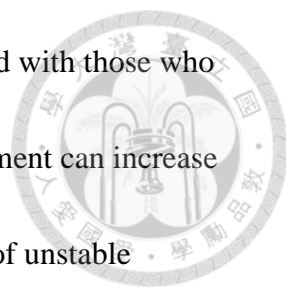
Traumatic events contribute to suicidal ideation, suicide attempts, and completed suicides⁷⁸⁻⁸⁰. Such effects can last for many years after the events. Brayant et al. followed up patients who experienced traumatic events in Australia at 3 months, 12 months, and 24 months after the injury. They reported that the prevalence rates of patients' MINI-diagnosed suicidality were relatively stable at approximately 6%⁸¹. However, they found that at different time points of follow-up, different people suffered from that condition. March et al. compared patients with major traumatic injury with the general population in Canada and found elevated ORs (3.3, 95% CI 2.0–5.5) for completed suicides and suicide attempts in patients who experienced traumatic events during a follow-up period of approximately 4.5 years⁸². The workers compensated for permanent occupational disability caused by the amputation of the upper or lower extremities in Taiwan had increased standardized mortality ratios (SMRs) for intentional self-harm (SMR = 4.5, 95% CI 2.2–8.2)⁸³. The



aforementioned findings are comparable with those of the current study, which found that at 6 years after OI, 10% of workers developed MINI-diagnosed suicidality, which is approximately 1.6 times that of the population surveyed using MINI at 3 years after an earthquake ⁸⁴. Our findings could not be compared to the general population because of the lack of MINI surveys in the background population of Taiwan. Moreover, when the workers were asked the question “Do you have thoughts of ending your life?” to assess suicidal ideation, 16% were found to have suicidal ideation, compared with 2.4% in the general population ⁴³. Notably, the observed rates of MINI-diagnosed suicidality and suicidal ideation at 6 years after OI were higher than those observed at 3 months (5.6% and 8.3%, respectively) and 12 months (5.9% and 11.0%, respectively). We found that contrary to the general belief that patients recover from psychological trauma with time, workers who sustained OI actually had more problems with suicidality after several years.

D. The risk factors for suicidal ideation at 6 years after OI

To identify the risk factors for suicidal ideation, we examined the relationship between suicidal ideation at 6 years after OI and personal, traumatic, and occupational factors. In addition to injury severity and the major effect of the injury on the physical appearance, unstable employment and reduced income were the crucial predictors of suicidal ideation. The RR for suicidal ideation was 1.5 (95% CI = 1.0–2.3) in 29.1%



of participants who reported having unstable employment, compared with those who had stable employment. Many studies have reported that unemployment can increase suicide ideation^{44,85,86}, but few studies have investigated the effect of unstable employment on suicide ideation. According to the 1998 National Health and Nutrition Examination Survey, in Korea, women with unstable employment were found to have a higher risk for suicide ideation than those with stable employment⁸⁷. However, such a finding was not observed for men. Depressive symptoms were found to be more prevalent in those with temporary employment than in those with stable employment^{88,89}. Because depressive symptoms are strong risk factors for suicide^{86,90}, our findings of increased suicidal ideation can be explained by poor mental health related to unstable employment.

In this study, 35.5% of participants had reduced income at 6 years after the injury. Reduced income was found to be a risk factor for suicidal ideation, with an RR of 1.6 (95% CI 1.2–2.2). Many studies have shown that lower levels of income are associated with the higher risk of suicidal ideation^{86,91,92}. However, few studies have assessed the association between reduced income decrease and suicidal ideation. A survey of 1,617 people randomly sampled from Iowa, USA, found an association between reduced income and suicidal ideation⁹³. The financial strain of the reduced income may increase the risk of suicide through the mechanisms of poor mental

health⁹⁴. Because workers may have reduced income⁹⁵ or low income growth¹⁷ after OI, the role of the reduced income in suicidal ideation may be more considerable than generally believed.



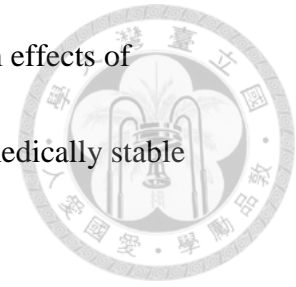
The current study found that at 6 years after OI, injuries majorly affecting the physical appearance and additional OIs requiring hospitalization for longer than 3 days were related to suicidal ideation. These results are similar to those of previous studies^{78,80}. In addition, at 3 months after OI, we found that the major effect of the injury on the physical appearance is a crucial risk factor for suicidal ideation.

E. Health-related quality of life at 6 years after OI

This is the first study to investigate health-related quality of life at 6 years after occupational injury. After adjustment for adverse life events and additional severe occupational injuries that occurred within the follow-up period, unstable employment and decreased salary after the injury were important risk factors for all QOL domains. In addition, the severity of injury affected the physical and psychological QOL domains.

To the best of our knowledge, up to 2016, only three other studies investigated QOL after occupational injuries, namely an Egyptian³³, an Iranian³⁴, and a US³⁵ study. These studies investigated workers' HRQOL within 1.5 years of occupational injury; therefore, the workers' QOL might have been influenced by the direct effects

of the injury. By contrast, our investigation examined the long-term effects of occupational injury on QOL, when the workers were presumably medically stable from the injury event.

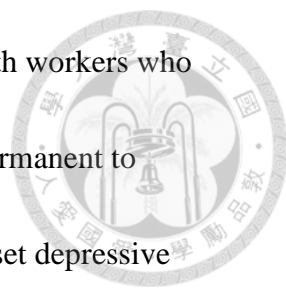


F. The risk factors for poor health-related quality of life at 6 years after OI

Among our participants, 21% stated that their physical appearance was severely affected by the injury. These participants had lower scores in the physical and psychological QOL domains than did those whose physical appearance was not severely affected by injury. Our findings regarding the impact of injury severity on QOL were consistent with those of our previous studies. Surveys in workers who had undergone amputation reported that they had poorer QOL than that of those who had injuries but did not undergo amputation^{33,34}.

In this investigation, 28% of injured workers experienced unstable employment during the 12 months before the questionnaire survey; these workers had lower scores in all QOL domains than did those with stable employment. In some studies, QOL after severe illnesses was higher among employed than among unemployed individuals⁹⁶⁻⁹⁹, whereas other studies reported no such differences¹⁰⁰⁻¹⁰². By contrast, among traumatized individuals in Germany, those who were employed had higher QOL scores than did those who were unemployed at 6 years after injury²⁴.

Furthermore, the return to work after traumatic injury was reported as a contributor to



good HRQOL¹⁰³. A study in Korea also revealed that compared with workers who had a permanent employment status, workers who transitioned from permanent to nonpermanent employment had a higher risk of developing new-onset depressive symptoms¹⁰⁴, which are a known risk factor for poor QOL^{56,105}. Because workers may experience involuntary job loss after occupational injury¹⁶, the role of unstable employment on poor QOL may be more relevant than is generally believed.

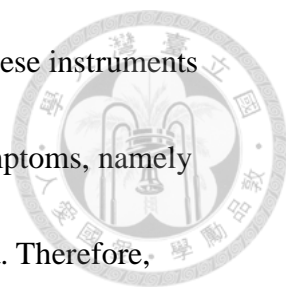
In this study, 35.5% of our participants experienced a decrease in salary after the injury, and these participants scored lower in all QOL domains. Among both healthy individuals and patients with various medical conditions, QOL has been associated with income^{106,107}. Among the four WHOQOL domains, the environmental domain is most frequently related to income¹⁰⁸. Furthermore, a survey illustrated that, compared with prostate cancer patients with low income, those with high income scored higher in the physical, psychological, and environment QOL domains¹⁰⁹. After occupational injury, decreased income⁹⁵ or decreased income growth¹⁷ are not uncommon; therefore, poor QOL resulting from the income factor poses a potential problem among injured workers.

Even years after traumatic injuries, QOL has been found to be affected. In Germany, Zwingmann et al. followed up on 147 polytraumatized patients at approximately 6 years after injury and reported that they had persistent pain,

functional disabilities, and poorer QOL than the general population did ²⁴. In the
aforementioned study, the Short-Form 36 (SF-36) was used to assess QOL. However,
SF-36 has flooring and ceiling effects ^{110,111}. In addition, the social functioning
domain of the SF-36 only emphasizes social activity, whereas the social domain of the
WHOQOL-BREF encompasses personal relationships, social support, and sexual
activity. Furthermore, the environment domain of the WHOQOL-BREF assesses
physical safety and security, physical environment, financial resources, accessibility
of information, leisure activity, home environment, health care, and transport ^{52,111}.

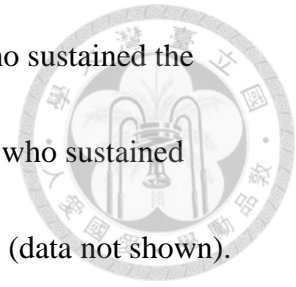
G. Advantage and limitation

Our results should be cautiously interpreted because of the following limitations.
First, the relatively low response rate (12.9% of the initially targeted working
population) poses a concern regarding the representativeness of the original working
population. However, a comparison of those who completed and did not complete the
questionnaire showed no significant difference in the severity of injury (duration of
hospitalization and physical appearance affected by injury), duration before return to
work after injury, psychological symptoms at 3 months after injury, and psychological
symptoms at 12 month after injury (data not shown). We therefore assume that the
study participants were reasonably representative of the factors affecting
psychological outcomes. Second, BSRS-5 and PTSC were used as the first tier



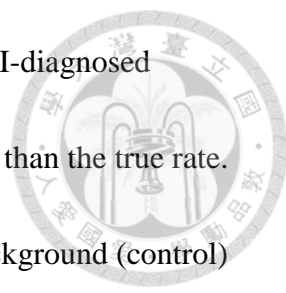
screening tool for including participants in the second tier MINI. These instruments were sensitive to detecting limited dimensions of psychological symptoms, namely anxiety, depression, hostility, interpersonal sensitivity, and insomnia. Therefore, psychological symptoms outside of these dimensions were less likely to be detected. Thus, this approach might have underestimated the overall prevalence of psychiatric disorders in the study population. Third, the estimation of psychiatric disorder prevalence rates by multiplying the prevalence rates obtained through MINIs by the percentage of high BSRS-5/PTSC scores may be overly simplified. This approach was based on the assumption that BSRS-5/PTSC serve as a screening tool for anxiety, depression, and PTSD/PPTSD, with equal detection power. Previous studies have shown that BSRS-5 and PTSC are good screening tools for general psychiatric disorders^{36,37} and PTSD/PPTSD³, respectively. Fourth, an uninjured control group should have been ideally included in this investigation for determining the effects of the injury on psychiatric conditions. However, the candidates of this study were injured workers who received workers' compensation payments. Because of confidentiality considerations, the contact details of the uninjured workers could not be obtained. Using the least severely injured workers as an internal control, the estimated rates of psychiatric disorders were compared with those among workers who sustained injuries of higher severity. The estimated rates of major depression,

generalized anxiety disorder, and PTSD/PPTSD among workers who sustained the least severe injury were 5.0%, 2.5%, and 2.5% and among workers who sustained injuries of higher severity were 9.7%, 7.7%, and 7.9%, respectively (data not shown).



These results support the finding that more severely injured workers had a higher risk of psychiatric conditions at 6 years after injury. In addition, a nationwide survey conducted between 2003 and 2005 by using the World Mental Health Survey of the World Health Organization Composite International Diagnostic Interview reported that the lifetime prevalence rate of major depression in adults in Taiwan was 1.2%¹¹², which was much lower than the rates in other industrialized countries^{113,114}.

Therefore, our study findings support the conclusion that the occurrence of psychiatric disorders increases at 6 years after occupational injury. Fifth, estimating suicidality prevalence rates by multiplying the prevalence rates obtained through MINIs with the percentage of workers with high BSRS-5 scores or positive suicidal ideation may be overly simplified. This approach was based on the assumption that BSRS-5 and suicidal ideation serve as a screening tool for suicidality. Previous studies have demonstrated that BSRS-5 and suicidal ideation are suitable screening tools for suicidality^{43,45,115,116}. Therefore, we believe that our two-tiered approach could have provided a reasonably accurate estimate. Sixth, among those with normal BSRS-5 scores and negative suicidal ideation, we did not further assess the potential false



negative results of these instruments for identifying those with MINI-diagnosed suicidality. This might have resulted in a lower observed suicidality than the true rate. Seventh, our study participants had all been injured; therefore, a background (control) comparison group was lacking. Therefore, we compared our findings with those from a survey of workers in Taiwan conducted in 2009, in which WHOQOL was used. The mean QOL scores in the physical, psychological, social, and environment domains among 1,173 health workers were 14.7, 13.7, 14.0, and 13.6, respectively¹⁰⁵. In the current study, the mean QOL scores in the corresponding domains were 13.9, 13.2, 13.1, and 12.9, indicating some reduction in life quality. However, this comparison is hampered by the difference in age and sex distribution between these two investigations.

We believe that this study has several strengths. First, the application of a longitudinal study design allow for an improved understanding of the impact of occupational injuries, as well as of personal, work, and social factors, on mental health and HRQOL. Second, the consecutive selection of participants from the National Labor Insurance database increased the national representativeness of the study sample. Third, in addition to the two most prevalent psychiatric disorders, namely PTSD and major depression, we investigated the occurrence of 15 common psychiatric disorders. Finally, all assessments of psychiatric diseases were performed

by a psychiatrist and trained nurses through the use of structured instruments, thus providing more objective and reliable results.



Chapter 6 Conclusions



A. Part I

This study suggests that at 6 years after occupational injury, depressive, anxiety, and PTSDs are still prevalent. Major depression and PTSD/PPTSD are even more prevalent among injured workers at 6 years after injury than at 3 months and 12 months after injury. In addition, a relatively high prevalence rate of generalized anxiety disorder was detected. The severity of injury and work instability were also risk factors for poor psychological symptoms. Future studies should focus on developing effective strategies to minimize the probability of suffering from the aforementioned psychiatric disorders after occupational injuries.

B. Part II

This study suggested that injured workers have a higher risk of suicidality at 6 years after OI than at 3 months and 12 months after injury. Injury severity, work instability, and reduced income are the risk factors for suicidal ideation. Future studies should develop effective strategies for minimizing suicidality after OI and for the early detection of high-risk workers.

C. Part III

At 6 years after occupational injury, workers with unstable employment contracts and decreased salaries after injury had poor QOL, after adjustment for other factors.



Chapter 7 Future work



A. Exploring risk factors for job instability after occupational injury

In this study, we found that job instability was associated with poor psychological symptoms, positive suicidal ideation, and lower scores of HRQOL. However, what are relative factors for causing workers' job instability post OI is unknown. Therefore, we will invite injured workers who reported having job instability to join in an in-depth interview to understand the risk factors for job stability after OI. Future studies could develop effective strategies for minimizing job instability after OI based on the aforementioned findings.

B. Establishing an integrated and comprehensive community health care system for occupationally injured workers

Each year in Taiwan, more than 50,000 workers get injured at work, and the continuing care and social security for those workers are rather scarce. Much inspired from the aforementioned literature review, here we urge to establish a comprehensive health care system by integrating all relevant resources at community level, to minimize possible psychosocial adjustment difficulties to the injured workers while their seeking for assistances

C. Understanding the disparities of the Workers' Compensation Systems



between Taiwan and other countries

The Workers' Compensation Scheme was not the prime scope of this study. In Taiwan, the maximum time period for receiving Temporary Total Disability (TTD) benefits is two years while many occupationally injured workers may not be able to return to work for longer periods. Therefore, we suggest that the labor authority should amend the workers' compensation system to prevent health and mental effects occurring later than two years. Thorough understanding and comparison of workers' compensation system in other developed countries may significantly assist the improvement of our workers' compensation system in this regard.

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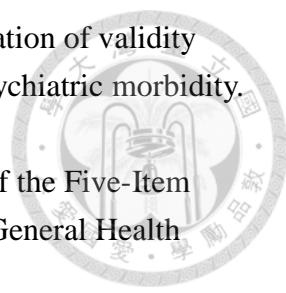


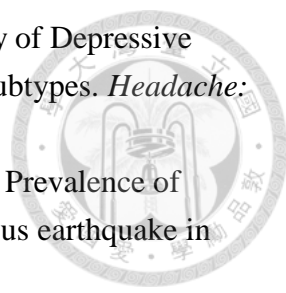
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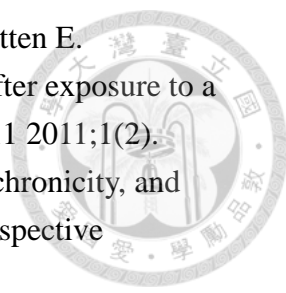
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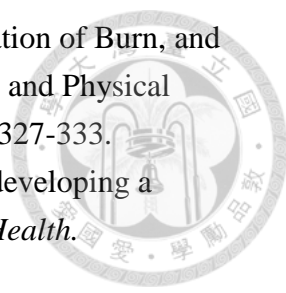
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Publication list



Published paper or accepted manuscripts

Chin WS, Guo YL, Hung YJ, Yang CY, Shiao SC. Short sleep duration is dose-dependently related to job strain and burnout in nurses: A cross sectional survey. *Int J Nursing Studies* 2015;52:297-306. doi: 10.1016/j.ijnurstu.2014.09.003.

Chin WS, Guo YL, Hsieh YT, Hung YJ, Wang LJ, Shiao JSC. Workplace justice and intention to leave nursing profession among secondary hospitals nurses in Taiwan. *Nursing Ethics* 2017; accepted for publication.

Weishan Chin, Judith Shu-Chu Shiao, Shih-Cheng Liao, Chun-Ya Kuo, Chih-Chieh Chen, Yue Leon Guo. Depressive, anxiety and post-traumatic stress disorders at six years after occupational injuries. *European Archives of Psychiatry and Clinical Neuroscience*. 2017:1-10.

Manuscript submitted

Weishan Chin, Judith Shu-Chu Shiao, Shih-Cheng Liao, Kuan-Han Lin, Chun-Ya Kuo, Chih-Chieh Chen, Yue Leon Guo. Prevalence rate of suicidality six years after occupational injury. Submitted for publication.

Weishan Chin, Judith Shu-Chu Shiao, Shih-Cheng Liao, Hsueh-Ching Wu, Chun-Ya Kuo, Chih-Chieh Chen, Yue Leon Guo. Quality of life at Six years after occupational injury. Submitted for publication.

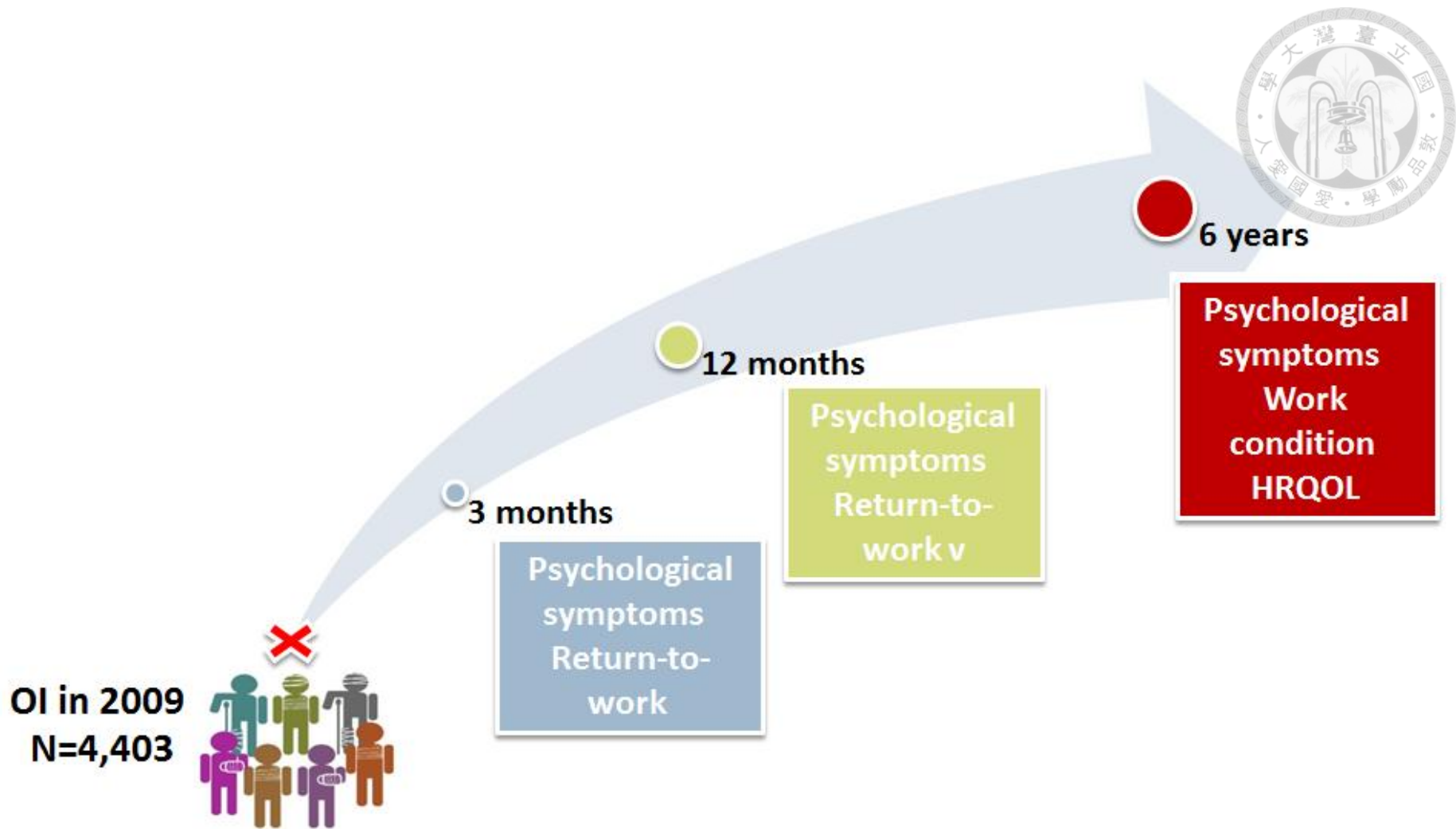


Figure 1. Study design

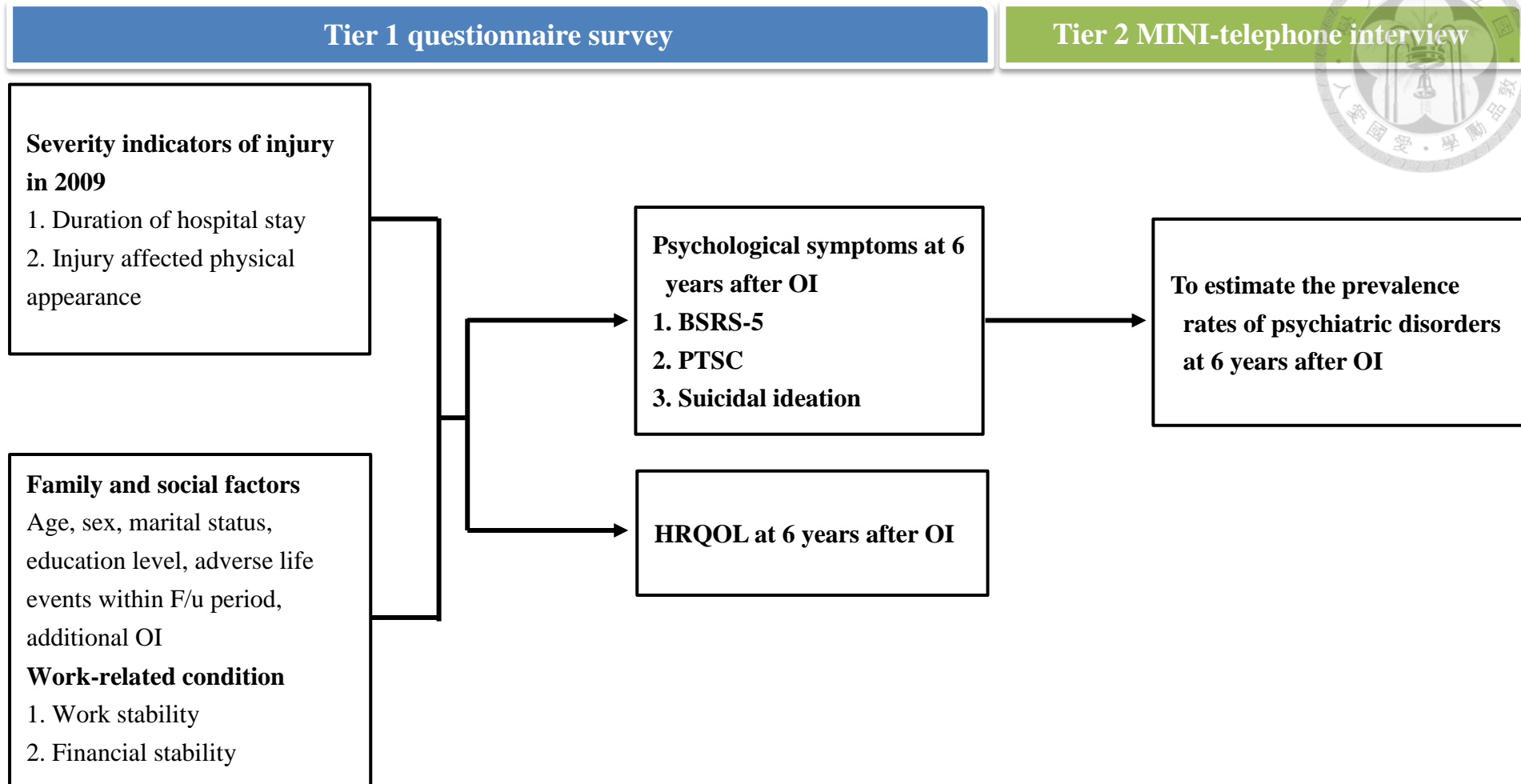


Figure 2. Study framework

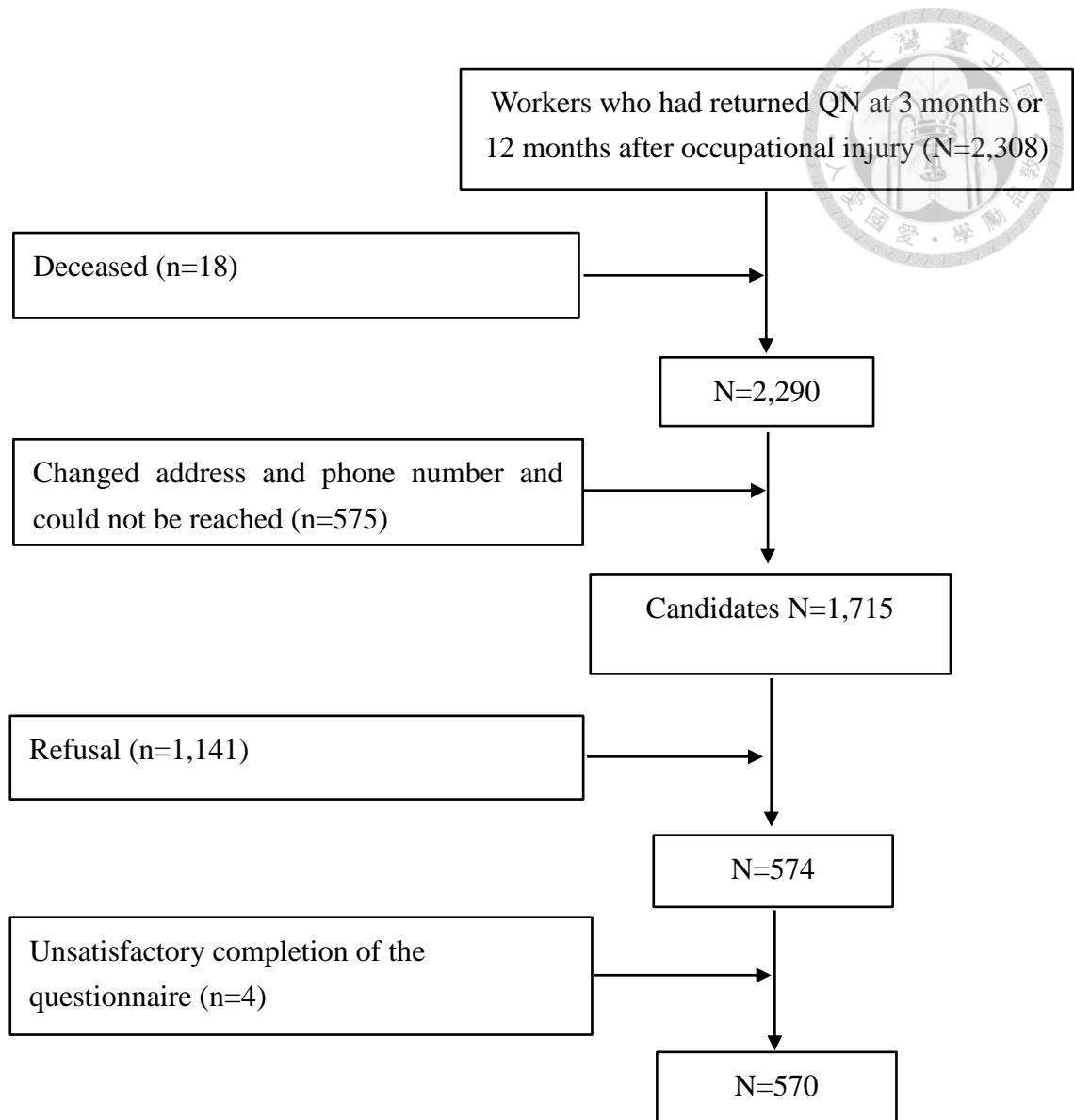
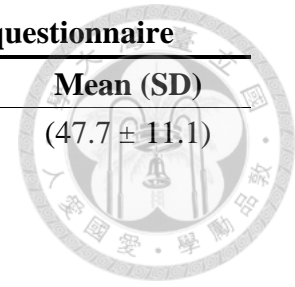


Figure 3. The flowchart of subjects' enrollment

Table 1 Characteristics of injured workers who completed the questionnaire

Variables	N	(%)	Mean (SD)
Age			(47.7 ± 11.1)
≤29	21	3.6	
30- 44	197	34.6	
45- 59	254	44.6	
≥60	98	17.2	
Sex			
Female	186	32.6	
Male	384	67.4	
Marital status			
Single	124	21.8	
Married	395	69.3	
Divorced/separated/widowed	51	8.8	
Education			
Elementary school or below	57	10.0	
Junior high school	94	16.5	
High school	239	41.9	
College or above	180	31.6	
Major adverse life events within the follow-up period			
Yes	379	66.5	
No	191	33.5	
Family member requiring care			
Yes	152	26.7	
No	418	73.3	
Duration of hospital stay immediately after injury in 2009 (days)			9.4 (± 10.7)
Whether the injury affected physical appearance			
No	180	31.6	
Yes, minor	270	47.4	
Yes, major	120	21.0	
The number of occupational injury-related hospitalizations since 2009 that had lasted for 3 days or longer			(1.2 ± 0.6)
1	495	86.8	
≥2	75	13.2	
Work status at questionnaire survey			



Retired	43	7.5
Employed	484	85.0
Unemployed	43	7.5
Disabled, under pension	6	
Disabled, not under pension	9	
Can't find a job	11	
Others	17	
How many different companies have you worked for since 2009		(0.9 ± 2.2)
0	367	64.4
1~3	168	29.5
≥4	35	6.1



Table 2 Psychological symptoms at 6 years after OI

Variable	n	%
BSRS-5 score		
<6	342	60.0
≥6	228	40.0
BSRS-5 symptom quite a bit or extremely		
Insomnia	80	14.0
Anxiety	49	8.6
Hostility	55	9.6
Depression	57	10.0
Interpersonal sensitivity	44	7.7
PTSC level		
None	470	82.5
Severe or higher	100	17.5
PTSC symptom quite a bit or extremely		
Physical discomfort	249	43.7
Unable to have sad or happy feeling	196	34.4
Becoming easily startled	295	51.8
Meet the criteria of Mini interview		
No	327	57.4
Yes	243	42.6

Table 3 Prevalence rates of psychiatric disorders among MINI interviewees and estimated prevalence rates of psychiatric disorders 6 years after OI

Psychiatric disorders	MINI interviewees (N = 135)		% with high score in screening by BSRS-5 and PTSC	Estimated Rates (N = 570)
	N	% (95% CI)		% (95 % CI)
Major depression	29	21.5 (15.4~ 29.1)	42.6	9.2 (6.6~ 12.4)
Generalized anxiety Disorder	22	16.3 (11.0 ~ 23.4)		6.9 (4.7~ 10.0)
Dysthymia	15	11.1 (6.9~ 17.5)		4.7 (2.9~ 7.5)
Partial post traumatic stress disorder	15	11.1 (6.9~ 17.5)		4.7 (2.9~ 7.5)
Alcohol dependence	9	6.7 (3.5~ 12.2)		2.9 (1.5~ 5.2)
Social phobia	9	6.7 (3.5 ~ 12.2)		2.9 (1.5~ 5.2)
Alcohol abuse	8	5.9 (3.0~ 11.3)		2.5 (1.3~ 4.8)
Post-traumatic stress disorder	8	5.9 (3.0~ 11.3)		2.5 (1.3~ 4.8)
Agoraphobia	4	3.0 (1.2~ 7.4)		1.3 (0.5~ 3.2)
Obsessive-compulsive disorder	4	3.0 (1.2~ 7.4)		1.3 (0.5~ 3.2)
Manic episode	2	1.5 (0.4 ~ 5.2)		0.6 (0.2~ 2.2)
Panic disorder	2	1.5 (0.4 ~ 5.2)		0.6 (0.2~ 2.2)
Hypomanic episode	0	-		0
Substance dependence	0	-		0
Substance abuse	0	-		0
Anorexia nervosa	0	-		0
Bulimia nervosa	0	-		0

Table 4 Factors for psychological symptoms (by BSRS) and post-traumatic stress disorder symptoms (by PTSC) by multiple regression models

Variables	BSRS-5 score		PTSC score	
	β^a	<i>p</i> value	β^a	<i>p</i> value
Age	-0.01	0.46	0.004	0.71
Marital status (married/ single & divorced/separated/widowed)	-0.03	0.87	-0.05	0.67
Sex (male/ female)	-0.04	0.84	0.12	0.22
Education (junior high school and below / others)	0.0008	1.00	0.03	0.83
Major adverse life events within the follow-up period (yes/ no)	0.86	<0.0001	0.32	0.0017
Family member requiring care (yes/ no)	0.53	0.0065	0.31	0.0047
Hospitalization for 3 days or longer due to occupational injury since 2009 (times)	1.31	<0.0001	0.69	<0.0001
Duration of hospital stay immediately after injury in 2009 (days)	0.03	0.04	0.04	0.0001
The injury affected physical appearance				
Yes, minor/ no	0.21	0.60	0.24	0.27
Yes, major/ no	1.59	0.0012	0.97	0.0004
Work status				
Retired/employed	1.08	0.12	0.29	0.44
Unemployed/employed	3.66	<0.0001	1.85	<0.0001
How many different companies have you worked for since 2009	0.34	<0.0001	0.07	0.12

^a Adjusted for all above variables

Table 5 Characteristics of injured workers who completed the questionnaire at 3, 12 months, and 6 years after OI

Time of Survey after occupational injury	3 months N=2,001	12 months N=1,233	6 years N=570
Variables	n (%)		
Mean age ± SD	42.0 ± 12.2	42.6 ± 11.8	47.7 ± 11.1
Age			
≤ 29	386 (19.3)	214 (17.3)	21 (3.6)
30- 44	765 (38.2)	456 (37.0)	197 (34.6)
45- 59	743 (37.1)	476 (37.0)	254 (44.6)
≥ 60	107 (5.3)	87 (7.1)	98 (17.2)
Gender			
Female	539 (26.9)	352 (28.5)	186 (32.6)
Male	1,462 (73.1)	881 (71.5)	384 (67.4)
Marital status			
Single	585 (29.2)	324 (26.2)	124 (21.8)
Married	1,253 (62.6)	814 (64.1)	395 (69.3)
Divorced/separated/widowed	163 (8.2)	95 (7.7)	51 (8.8)
Education			
Elementary school or below	238 (11.9)	143 (11.6)	57 (10.0)
Junior high school	409 (20.4)	231 (18.7)	94 (16.5)
High school	853 (42.6)	537 (43.6)	239 (41.9)
College or above	501 (25.1)	322 (26.1)	180 (31.6)
Adverse life event within the follow-up period			
Yes	197 (9.8)	206 (16.7)	379 (66.5)
No	1,804 (90.2)	1,027 (83.3)	191 (33.5)
Length of hospital stay immediately after injury in 2009 (Mean± SD)	8.9 ± 8.9	9.8 ± 11.6	9.4 ± 10.7
Whether this injury affected physical appearance			
No	601 (30.0)	463 (37.6)	180 (31.6)
Yes, minor	907 (45.3)	535 (43.4)	270 (47.4)
Yes, major	493 (24.7)	235 (19.0)	120 (21.0)
Work status at questionnaire survey			
Employed	1149 (57.4)	970 (78.7)	484 (85.0)
Unemployed	852 (42.6)	263 (21.3)	86 (15.0)
BSRS-5			
<6	1,424 (71.2)	903 (75.4)	324 (60.0)
≥ 6	577 (28.8)	303 (24.6)	228 (40.0)

Suicidal ideation

No	1,834 (91.7)	1,097 (89.0)	476 (83.5)
Yes	167 (8.3)	136 (11.0)	94 (16.5)

BSRS-5 scores \geq 6 or positive suicidal ideation

No	1,390 (69.5)	899 (72.1)	325 (57.0)
Yes	611 (30.5)	344 (27.9)	245 (43.0)

Table 6 Rates of MINI-diagnosed suicidality, as estimated by multiplying % with suicidality among MINI-interviewees by % of participants fulfilling criteria for MINI interview, at 3, 12 months, and 6 years after OI

Time of survey after occupational injury	MINI interviewees		% fulfilling criteria for MINI interview*	Estimated Rates % (95 % CI)
	No. with suicidality / No. completed MINI interview	% (95% CI)		
3 months	21/115	18.3 (12.3~ 26.3)	30.5	5.6 (3.8~8.0)
12 months	19/90	21.1 (14.0~ 30.6)	27.9	5.9 (3.9~ 8.5)
6 years	31/131	23.7 (17.2~ 31.6)	43.0	10.2 (7.4~ 13.6)

*BSRS-5 scores \geq 6 or positive suicidal ideation in first-tier questionnaire survey

Table 7 Crude odds ratios and relative risk of potential factors for having suicide ideation at 6 years after OI

Variables	Subjects (%)	% with suicidal ideation	OR (95% CI)	RR (95% CI)
All participants	570 (100)	16.5		
Age				
≤29	21 (3.6)	23.8	Reference	Reference
30- 44	197 (34.6)	14.7	0.5 (0.2~1.8)	0.8 (0.5~ 1.2)
45- 59	254 (44.6)	16.9	0.7 (0.2~2.1)	0.9 (0.6~ 1.4)
≥60	98 (17.2)	17.4	0.7 (0.2~2.3)	1.0 (0.6~ 1.5)
Gender				
Female	186 (32.6)	15.6	Reference	Reference
Male	384 (67.4)	16.9	1.1 (0.7~1.8)	1.1 (0.7~1.6)
Marital status				
Married	395 (69.3)	15.7	Reference	Reference
Single	124 (21.8)	17.7	1.2 (0.7~2.0)	1.0 (0.7~1.5)
Divorced/separated/widowed	51(8.8)	19.6	1.3 (0.6~2.7)	1.1 (0.7~1.8)
Education				
High school or above	419 (73.5)	15.5	Reference	Reference
Middle school or lower	151 (26.5)	19.2	1.3 (0.8~2.1)	1.2 (0.8~1.8)
Adverse life event within the follow-up period				
No	191 (33.5)	11.5	Reference	Reference
Yes	379 (66.5)	19.0	1.8 (1.1~3.0)	1.6 (1.1~2.6)
Family member requiring care				
No	418 (73.3)	14.4	Reference	Reference
Yes	152 (26.7)	22.4	1.7 (1.1~2.7)	1.6 (1.1~2.3)
Length of hospital stay immediately after injury in 2009 (days)				
<8	353 (61.9)	17.6	Reference	Reference
≥8	217 (38.1)	14.8	0.8 (0.5~1.3)	0.8 (0.6~1.2)
Whether this injury affected physical appearance				
No	180 (31.6)	13.3	Reference	Reference
Yes, minor	270 (47.4)	13.3	1.0 (0.6~1.8)	0.7 (0.5~1.0)
Yes, major	120 (21.0)	28.3	2.6 (1.4~4.7)	1.9 (1.4~2.6)
Additional occupational injury requiring >3 days hospitalization				
No	495 (86.8)	14.3	Reference	Reference
Yes	75 (13.2)	30.7	2.6 (1.5~4.6)	2.1 (1.4~3.2)
Employment status at the year before questionnaire survey				

Stable employment	372 (65.3)	11.0	Reference	Reference
Retired	32 (5.6)	18.8	19 (0.7~4.5)	1.0 (0.5~1.8)
Unstable employment	166 (29.1)	28.1	3.2 (2.0~5.1)	1.8 (1.2~2.6)
Reduced salary in the past one year as compared to that before occupational injury				
No	360 (63.2)	9.4	Reference	Reference
Yes	210 (36.8)	28.6	3.8 (2.4~6.1)	3.0 (2.1~4.4)

Table 8 Association between suicidal ideation and social-demographic and injury factors using Binomial log-linear regression for adjusted odds, RRs, and PARs^a.

Variables	Prevalence ^b (%)	aRR ^a	aPAR ^a
Adverse life event within the follow-up period			
No	33.5	Reference	
Yes	66.5	1.1 (0.8~1.4)	-
Family member requiring care			
No	73.3	Reference	
Yes	26.7	1.2 (0.9~1.5)	-
Whether this injury affected physical appearance			
No	31.6	Reference	
Yes, minor	47.4	0.8 (0.6~1.1)	-
Yes, major	21.0	1.7 (1.2~2.4) **	12.7
Additional occupational injury requiring >3 days hospitalization			
No	86.8	Reference	
Yes	13.2	1.4 (1.0~1.9) *	4.9
Employment status at the year before questionnaire survey			
Stable employment	65.3	Reference	
Retired	5.6	0.8(0.4~1.4)	-
Unstable employment	29.1	1.5 (1.0~2.3) *	13.2
Reduced salary in the past one year as compared to that before occupational injury			
No	63.2	Reference	
Yes	36.8	1.6 (1.2~2.2) **	19.0

Note:

a. Mutually adjusted and adjusted for above variables

b. % of participants.

*: p<0.05; **: p<0.01.

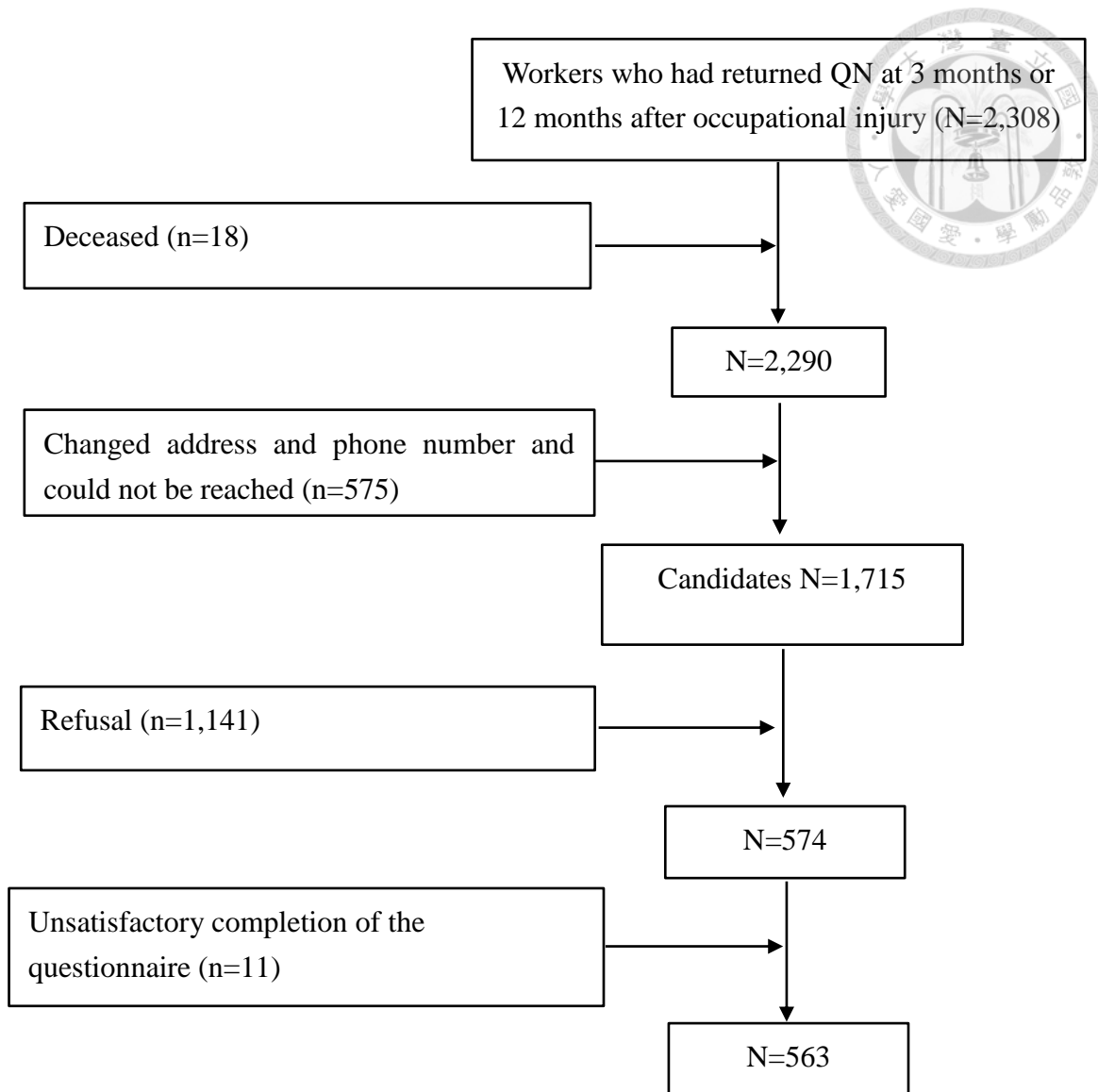


Figure 3. The flowchart of subjects' enrollment

Table 9 Characteristics of injured workers who completed the questionnaire

Variables	N	(%)	Mean (SD)
Age			47.6 (\pm 11.1)
\leq 29	21	3.7	
30- 49	197	35.0	
50- 59	249	44.2	
\geq 60	96	17.1	
Gender			
Female	184	32.7	
Male	379	67.3	
Marital status			
Single	122	21.7	
Married	391	69.4	
Divorced/separated/widowed	50	8.9	
Education			
Elementary school or below	56	10.0	
Junior high school	92	16.3	
High school	237	42.1	
College or above	178	31.6	
Adverse life event within the follow-up period			
Yes	373	66.3	
No	190	33.7	
Family member requiring care			
Yes	150	26.6	
No	413	73.4	
Length of hospital stay immediately after injury in 2009 (days)			9.3 (\pm 10.4)
<8 days	349	62.0	
\geq 8 days	214	38.0	
Whether this injury affected physical appearance			
No	177	31.4	
Yes, minor	268	47.6	
Yes, major	118	21.0	
Additional occupational injury requiring >3 days hospitalization			
Yes	72	12.8	
No	491	87.2	
Employment status at the year before questionnaire survey			
Stable employment	371	65.9	
Unstable employment	160	28.4	

Retired	32	5.7
Reduced salary in the past one year as compared to that before occupational injury		
Yes	200	35.5
No	363	64.5



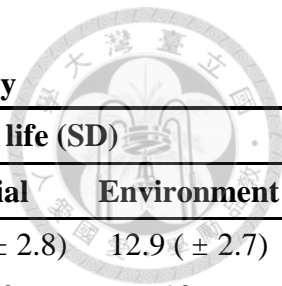


Table 10 The mean scores of WHOQOL-BREF according subjects' demographic factors and factors related to injury

Variables		Mean scores of quality of life (SD)				
		Physical	Psychological	Social	Environment	
All subjects	N=563	13.9 (± 2.8)	13.2 (± 2.9)	13.1 (± 2.8)	12.9 (± 2.7)	
Taiwan workers' survey in Quality of Life research ¹⁰⁵	N=1,173	14.7	13.7	14.0	13.6	
Age						
	≤29	21 (3.7)	13.2 (±3.5)	12.1 (± 3.7)	12.4 (± 3.7)	12.6 (± 3.1)
	30- 49	197 (35.0)	14.2 (± 2.7)	13.2 (± 2.9)	13.2 (± 3.0)	13.0 (± 2.7)
	50- 59	249 (44.2)	13.8 (± 2.7)	13.3 (± 2.9)	13.1 (± 2.6)	12.9 (± 2.7)
	≥60	96 (17.1)	13.6 (± 2.9)	13.2 (± 2.8)	12.9 (± 2.6)	12.8 (± 2.6)
Gender						
	Female	184 (32.7)	13.9 (± 2.6)	13.1 (± 2.7)	13.4 (± 2.4)	13.0 (± 2.5)
	Male	379 (67.3)	13.9 (± 2.9)	13.2 (± 3.0)	13.0 (± 2.4)	12.8 (± 2.8)
Marital status						
	Unmarried (Single/Divorced/separated/widowed)	172 (30.6)	14.0 (± 2.9)	12.9 (± 3.1)	12.7 (± 3.0)	12.9 (± 2.7)
	Married	391 (69.4)	13.9 (± 2.7)	13.3 (± 2.8)	13.3 (± 2.7)	12.9 (± 2.7)
Education						
	Junior high school or below	148 (26.3)	13.6 (± 3.0)	13.0 (±3.1)	13.0 (± 2.9)	12.6 (± 2.7)
	High school or above	415 (73.7)	14.0 (± 2.7)	13.5 (±2.9)	13.1 (± 2.8)	13.0 (± 2.7)
Adverse life event within the follow-up period						
	Yes		***	***	***	***
		373 (66.3)	13.4 (± 2.8)	12.7 (± 2.9)	12.7 (± 2.9)	12.5 (±2.8)

No	190 (33.7)	14.9 (± 2.6)	14.2 (± 2.6)	13.9 (± 2.4)	13.7 (± 2.4)
Family member requiring care		***	*		***
Yes	150 (26.6)	13.1 (± 2.9)	12.7 (± 3.0)	12.9 (± 2.9)	12.2 (± 2.7)
No	413 (73.4)	14.2 (± 2.7)	13.4 (± 2.9)	13.2 (± 2.8)	13.2 (± 2.7)
Length of hospital stay immediately after injury in 2009 (days)					
<8 days	349 (62.0)	14.1 (± 2.7)	13.3 (± 2.8)	13.2 (± 2.7)	13.0 (± 2.6)
≥8 days	214 (38.0)	13.7 (± 3.0)	12.9 (± 3.1)	12.9 (± 3.0)	12.7 (± 2.9)
Whether this injury affected physical appearance		**	**	**	**
No	177 (31.4)	14.1 (± 2.6)	13.4 (± 2.8)	13.3 (± 2.6)	12.9 (± 2.5)
Yes, minor	268 (47.6)	14.2 (± 2.7)	13.4 (± 2.9)	13.2 (± 2.9)	13.2 (± 2.7)
Yes, major	118 (21.0)	13.0 (± 3.2)	12.3 (± 3.1)	12.4 (± 2.9)	12.2 (± 3.0)
Employment status at the year before questionnaire survey		***	***	***	***
Stable employment	371 (65.9)	14.4 (± 2.6)	13.6 (± 2.8)	13.5 (± 2.6)	13.3 (± 2.6)
Unstable employment	160 (28.4)	12.8 (± 2.9)	12.2 (± 3.0)	12.2 (± 3.1)	11.8 (± 2.7)
Retired	32 (5.7)	13.5 (± 3.1)	12.9 (± 2.7)	12.8 (± 2.7)	13.2 (± 2.6)
Reduced salary in the past one year as compared to that before occupational injury		***	***	***	***
Yes	200 (35.5)	12.9 (± 3.0)	12.3 (± 3.1)	12.3 (± 2.9)	12.1 (± 2.8)
No	363 (64.5)	14.5 (± 2.5)	13.6 (± 2.7)	13.5 (± 2.7)	13.3 (± 2.5)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.0001$

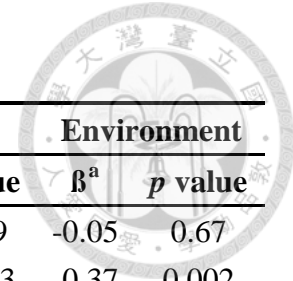


Table 11 Factors for each domain of WHOQOL-BREF by multiple regression models

Variables	Physical		Psychological		Social		Environment	
	β^a	<i>p</i> value	β^a	<i>p</i> value	β^a	<i>p</i> value	β^a	<i>p</i> value
Marital status (unmarried/separated vs. married)	-0.008	0.94	-0.23	0.07	-0.33	0.009	-0.05	0.67
Adverse life event within the past 6 years (yes vs. no)	-0.48	<0.0001	-0.56	<0.0001	-0.45	0.0003	-0.37	0.002
Family member requiring care (yes vs. no)	-0.34	0.006	-0.16	0.22	-0.02	0.90	-0.31	0.01
Additional occupational injury requiring >3 days hospitalization (yes vs. no)	-0.65	<0.0001	-0.42	0.02	-0.35	0.04	-0.36	0.03
Whether this injury affected physical appearance								
Yes, minor vs. No	0.20	0.16	0.21	0.18	0.10	0.51	0.24	0.11
Yes, major vs. No	-0.46	0.01	-0.49	0.01	-0.35	0.07	-0.33	0.07
Employment status at the year before questionnaire survey								
Retired vs. stable employment	0.18	0.60	0.13	0.71	0.09	0.80	0.56	0.09
Unstable vs. stable employment	-0.53	0.01	-0.51	0.02	-0.43	0.05	-0.74	0.0005
Reduced salary in the past one year as compared to that before occupational injury (yes vs. no)	-0.45	0.0008	-0.33	0.02	-0.35	0.01	-0.34	0.01

^a Adjusted for all above variables

Appendix list



A. Institutional Review Board

國立臺灣大學醫學院附設醫院B研究倫理委員會

Research Ethics Committee B
National Taiwan University Hospital
7, Chung-Shan South Road, Taipei, Taiwan 100, R.O.C
Phone: 2312-3456 Fax: 23931950

臨床試驗/研究許可書

許可日期：2014年4月29日

倫委會案號：201401075RINB

計畫名稱：心理韌性與職場正義是否影響受傷勞工之心理健康與復工：五年追蹤研究。

試驗機構：國立臺灣大學

部門/計畫主持人：臺灣大學護理學系暨研究所 蕭淑鍊副教授

計畫文件版本日期：

計畫書：version1 2014/01/17

中文摘要：Version1 2014/01/07

英文摘要：Version1 2014/01/07

同意書：2014/04/23

問卷：version1 2014/01/07

上述計畫業經2014年3月21日本院B研究倫理委員會第52次會議審查同意，符合研究倫理規範，並同意免除書面知情同意，但均需詢問受試者是否願意簽署同意書，若願意仍須提供簽署。本委員會的運作符合優良臨床試驗準則及政府相關法律規章。
本臨床試驗/研究許可書之有效期限為一年(自2014年4月29日至2015年4月28日止)，計畫主持人須依國內相關法令及本院規定通報嚴重不良反應事件及非預期問題，並應於到期日至少6週前提出持續審查申請表，本案需經持續審查，方可繼續執行。

主任委員

何弘能

Clinical Trial/Research Approval

Date of approval: Apr 29, 2014

NTUH-REC No. : 201401075RINB

Title of protocol : Whether resilience and workplace justice affect injured workers' mental health and return-to-work: A five-year follow-up study.

Trial/Research Institution : National Taiwan University

Department/ Principal Investigator : School of Nursing / Shu-Chu Judith Associate Professor

Version date of documents :

Protocol: version1 2014/01/17

Abstract: Version1 2014/01/07

Abstract(English): Version1 2014/01/07

ICF: 2014/04/23

Questionnaire: version1 2014/01/07

The protocol and the request for the waiver of documentation of informed consent have been approved (each participant will be asked whether he/she wants documentation linking the participant with the research and the participant's wishes will govern) by the 52nd meeting of Research Ethics Committee B of the National Taiwan University Hospital on Mar 21, 2014. The committee is organized under, and operates in accordance with, the Good Clinical Practice guidelines and governmental laws and regulations.

The duration of this approval is one year (from Apr 29, 2014 to Apr 28, 2015). The investigator is required to report Serious Adverse Events and Unanticipated Problems in accordance with the governmental laws and regulations and NTUH requirements and apply for a continuing review not less than six weeks prior to the approval expiration date.

Hong-Nerng Ho, M.D.

Chairman

Research Ethics Committee B

蕭淑鍊

B. Approval of applying questionnaires



B.1 Taiwan version of WHOQOL-BRED

臺灣版世界衛生組織生活品質問卷 (WHOQOL-BREF 臺灣簡明版)使用授權書

本人代表臺灣版世界衛生組織生活品質問卷發展小組，同意台灣大學職業醫學與工業衛生研究所博士生秦唯珊，在其研究「心理韌性與職場正義是否影響受傷勞工之心理健康與復工：五年追蹤研究」中，使用臺灣版世界衛生組織生活品質問卷發展小組所發展出的臺灣簡明版世界衛生組織生活品質問卷 (WHOQOL-BREF 台灣簡明版)，做為研究之一部分。

授權人

單位：國立臺灣大學心理系姚開屏教授

日期：2014 年 2 月 21 日

簽章：姚開屏



B.2 Resilience scales



Weishan Chin <weishanlinda@gmail.com>



An approval for applying "Resilience scale"

Friborg Oddgeir <oddgeir.friborg@uit.no>
收件者: Weishan Chin <weishanlinda@gmail.com>

2014年2月19日 下午5:50

Thank you for getting more information about the project. You have a really big sample, and the intended use of the RSA (as a predictor) of mental health problems following occupation injury was interesting.

You are welcomed to include the RSA, which has been attached to this email.

If you are planning to write up a paper for publication, and would like to consider me as a collaborator/co-author regarding the write-up of the resilience data, I would be happy to assist.

Good luck with your research,

All the best,

-oddgeir

Oddgeir Friborg

Professor, PhD

UiT The Arctic University of Norway

Faculty of Health Sciences, Department of Psychology

Head of Health psychology research group

N-9037 Tromsø, Norway

Phone: +47 776 46772

Email: oddgeir.friborg@uit.no

B.3 The Taiwanese version of the MINI



MINI 台灣版使用同意書(第 20 屆第 6 次理事會通過)

蕭淑銖 副教授：

茲同意 台端使用本會負責編譯之「MINI 台灣版」，請依申請書
之規定事項辦理，祝研究順利成功。

台灣精神醫學會
理 事 長

周煜智

103 年 12 月 17 日

註 1·「MINI 台灣版」請自行印製。

註 2·申請者須提供本會使用此一 MINI 問卷台灣版之研究計劃發表

成果報告或研究論文抽印本乙份，予學會留查。



4. 請問您目前是否有工作？

- 有
- 沒有，原因：
 - 退休
 - 已領有失能殘障給付
 - 能力已無法應付工作
 - 有找工作，但找不到
 - 其它

5. 請根據下列表格，填寫您近幾年的工作情形。

時間(民國)	請問您於此段時間實際工作幾個月？	此階段有工作時的月份，平均薪水是受僱前的幾成？	此階段主要工作，您和僱用者的契約關係(書面上或口頭上)屬於哪一種？
103年	<input type="radio"/> 沒工作 <input type="radio"/> 小於3個月 <input type="radio"/> 3至6個月 <input type="radio"/> 6至9個月 <input type="radio"/> 大於9個月	<input type="radio"/> 1成 <input type="radio"/> 2成 <input type="radio"/> 3成 <input type="radio"/> 4成 <input type="radio"/> 5成 <input type="radio"/> 6成 <input type="radio"/> 7成 <input type="radio"/> 8成 <input type="radio"/> 9成 <input type="radio"/> 10成(與民國97年時相同) <input type="radio"/> 高於民國97年	<input type="radio"/> 長期僱用 <input type="radio"/> 約聘僱 <input type="radio"/> 暫僱 <input type="radio"/> 其他_____
102年	<input type="radio"/> 沒工作 <input type="radio"/> 小於3個月 <input type="radio"/> 3至6個月 <input type="radio"/> 6至9個月 <input type="radio"/> 大於9個月	<input type="radio"/> 1成 <input type="radio"/> 2成 <input type="radio"/> 3成 <input type="radio"/> 4成 <input type="radio"/> 5成 <input type="radio"/> 6成 <input type="radio"/> 7成 <input type="radio"/> 8成 <input type="radio"/> 9成 <input type="radio"/> 10成(與民國97年時相同) <input type="radio"/> 高於民國97年	<input type="radio"/> 長期僱用 <input type="radio"/> 約聘僱 <input type="radio"/> 暫僱 <input type="radio"/> 其他_____
101年	<input type="radio"/> 沒工作 <input type="radio"/> 小於3個月 <input type="radio"/> 3至6個月 <input type="radio"/> 6至9個月 <input type="radio"/> 大於9個月	<input type="radio"/> 1成 <input type="radio"/> 2成 <input type="radio"/> 3成 <input type="radio"/> 4成 <input type="radio"/> 5成 <input type="radio"/> 6成 <input type="radio"/> 7成 <input type="radio"/> 8成 <input type="radio"/> 9成 <input type="radio"/> 10成(與民國97年時相同) <input type="radio"/> 高於民國97年	<input type="radio"/> 長期僱用 <input type="radio"/> 約聘僱 <input type="radio"/> 暫僱 <input type="radio"/> 其他_____
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99年	<input type="radio"/> 沒工作 <input type="radio"/> 小於3個月 <input type="radio"/> 3至6個月 <input type="radio"/> 6至9個月 <input type="radio"/> 大於9個月	<input type="radio"/> 1成 <input type="radio"/> 2成 <input type="radio"/> 3成 <input type="radio"/> 4成 <input type="radio"/> 5成 <input type="radio"/> 6成 <input type="radio"/> 7成 <input type="radio"/> 8成 <input type="radio"/> 9成 <input type="radio"/> 10成(與民國97年時相同) <input type="radio"/> 高於民國97年	<input type="radio"/> 長期僱用 <input type="radio"/> 約聘僱 <input type="radio"/> 暫僱 <input type="radio"/> 其他_____
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* 說明：長期僱用：通常能夠續任(即勞基法所稱「不定期契約」)
 約聘僱：臨時性、短期性、季節性契約(即勞基法所稱「定期契約」)
 暫僱：工讀、臨時工、代班(代課)等非長期，且無明確僱用期間的「臨時人員」

6. 請問自民國97年至今您總共在幾個不同公司工作過？_____個(數字) 都在同一家公司

十位	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
個位	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9

7. 請問您民國97年至今是否曾因就業困難，而尋求過下列資源的協助？

- 無就業困難
- 復工評估
- 工作能力評估及強化
- 就業輔導
- 職業訓練
- 其他_____ (請說明)

五、身心健康

- 1. 一般說來，您認為您目前的健康狀況如何？ 很好 好 普通 不好 很不好
- 2. 請依據您最近的工作狀況與感受回答下列各題。

項 目(請每項都要填答)	很不同意	不同意	同意	很同意
01. 主管或管理部門對員工是信任的。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
02. 主管或管理部門所傳達的訊息內容是可信的。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
03. 主管或管理部門對員工的工作安排與責任分派是公平的。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
04. 主管或管理部門對於員工薪資福利的安排是公平的。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
05. 主管或管理部門對員工的績效評估是公平的。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
06. 主管或管理部門在重要決策過程中，會主動告知並提供充分的資訊給員工。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
07. 主管或管理部門以尊重的方式對待員工。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
08. 在我的職場中，有捍衛受僱者利益的工會或工作者組織。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
09. 在我的職場中，有足以影響公司決策的工會或工作者組織。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

【請翻至第 3 面繼續作答】 MPP1030529AP (2)

3. 以下想瞭解您最近心情上的變化，給您帶來困擾感受的程度，請勾選最符合的一項。

項 目(請每項都要填答)	完全沒有	輕微	中等程度	厲害	非常厲害
01. 我遇到睡眠困難，譬如難以入睡、易醒或早醒。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
02. 我會感覺到緊張不安。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
03. 我會感覺容易苦惱或動怒。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
04. 我會感覺憂鬱、心情低落。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
05. 我會覺得比不上別人。	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
06. 有自殺的想法	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. 心理韌性成人自填量表：

以下問題都有兩種相反的描述來表達個人狀況，請依照最接近您目前的想法來勾選，例如：

我覺得生活 新鮮有趣 ① ● ③ ④ ⑤ 平淡無奇

表示，我覺得生活比較接近新鮮有趣，而不太會平淡無奇。

01. 我的未來計畫是.....	難以完成 ① ② ③ ④ ⑤	有可能完成
02. 當有非預期事情發生時.....	我總是找到解決之道 ① ② ③ ④ ⑤	我時常感到困惑
03. 我家人所理解生命中重要的事情是..	與我相當不同 ① ② ③ ④ ⑤	與我非常相似
04. 我覺得我的未來是.....	大有可為的 ① ② ③ ④ ⑤	不確定的
05. 我的未來目標.....	我知道如何去完成 ① ② ③ ④ ⑤	我不太確定如何去完成
06. 可以與我討論私事的人.....	沒有人 ① ② ③ ④ ⑤	朋友/家人
07. 我覺得.....	和我家人在一起非常快樂 ① ② ③ ④ ⑤	和我家人在一起非常不快樂
08. 我享受.....	與他人在一起 ① ② ③ ④ ⑤	自己獨處
09. 很會鼓勵我的那些人是.....	一些和我親近的朋友/家人 ① ② ③ ④ ⑤	不存在的
10. 我們朋友之間的連結是.....	微弱的 ① ② ③ ④ ⑤	強韌的
11. 我的個人問題.....	是無法解決的 ① ② ③ ④ ⑤	我知道如何去解決
12. 當家人發生危機/緊急情況時.....	我會被立即告知 ① ② ③ ④ ⑤	我過了一段時間才會被告知
13. 我的家庭特性是.....	疏離的 ① ② ③ ④ ⑤	有健全的凝聚力
14. 在社交情境中進退得宜.....	對我來說是不重要 ① ② ③ ④ ⑤	對我來說是很重要的
15. 我的支持來自於.....	朋友/家人 ① ② ③ ④ ⑤	沒有人
16. 我的家庭在困難時期.....	對於未來保持正面觀點 ① ② ③ ④ ⑤	認為未來灰暗
17. 我的能力.....	我非常相信 ① ② ③ ④ ⑤	我不太確定
18. 對於我的判斷與決定.....	我時常懷疑 ① ② ③ ④ ⑤	我完全信任
19. 交新朋友這件事情.....	我可以輕易做到 ① ② ③ ④ ⑤	我難以做到
20. 當我有需要時.....	沒有人可以幫我 ① ② ③ ④ ⑤	總是有人可以幫我
21. 可以將事情做到最好的時候是當我..	有個清楚的目標去完成時 ① ② ③ ④ ⑤	有整天的時間可以運用時
22. 和不認識的人聚會是.....	對我來說很困難 ① ② ③ ④ ⑤	我所擅長的事情
23. 當我和其他人在一起時.....	我很容易笑 ① ② ③ ④ ⑤	我很少笑
24. 當我開始新的事情和計畫時.....	我很少預先計畫，只是繼續做 ① ② ③ ④ ⑤	我喜歡事先有完整的計畫
25. 面對其他人時，我的家人會採取....	不支持彼此 ① ② ③ ④ ⑤	對彼此忠誠
26. 對我來說，找個好話題是.....	困難的 ① ② ③ ④ ⑤	容易的
27. 我親近的朋友/家人.....	欣賞我的特質 ① ② ③ ④ ⑤	不喜歡我的特質
28. 我擅長.....	安排我的時間 ① ② ③ ④ ⑤	浪費我的時間
29. 在我的家庭裡我們喜歡.....	靠自己做事情 ① ② ③ ④ ⑤	一起做事情
30. 日常生活的規則與規律.....	在我的生活中是不存在的 ① ② ③ ④ ⑤	使我的生活更容易
31. 在困難時期我傾向.....	認為事情都是灰暗的 ① ② ③ ④ ⑤	找到良好的方式幫助自己成功
32. 我的未來目標是.....	不清楚的 ① ② ③ ④ ⑤	經過深思熟慮的
33. 在生活中我所無法左右的事件.....	我會設法去處理 ① ② ③ ④ ⑤	是個煩惱/擔心的持續來源

5. 請選出最適合您在最近兩星期內對自己健康的滿意程度

項 目 (請每項都要填答)					
1. 整體來說，您如何評價您的生活品質？	<input type="radio"/> 極不好	<input type="radio"/> 不好	<input type="radio"/> 中等程度好	<input type="radio"/> 好	<input type="radio"/> 極好
2. 整體來說，您滿意自己的健康嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
3. 您覺得身體疼痛會妨礙您處理需要做的事情嗎？	<input type="radio"/> 完全沒有妨礙	<input type="radio"/> 有一點妨礙	<input type="radio"/> 中等程度妨礙	<input type="radio"/> 很妨礙	<input type="radio"/> 極妨礙
4. 您需要靠醫療的幫助應付日常生活嗎？	<input type="radio"/> 完全沒有需要	<input type="radio"/> 有一點需要	<input type="radio"/> 中等程度需要	<input type="radio"/> 很需要	<input type="radio"/> 極需要
5. 您享受生活嗎？	<input type="radio"/> 完全沒有享受	<input type="radio"/> 有一點享受	<input type="radio"/> 中等程度享受	<input type="radio"/> 很享受	<input type="radio"/> 極享受
6. 您覺得自己的生命有意義嗎？	<input type="radio"/> 完全沒有	<input type="radio"/> 有一點有	<input type="radio"/> 中等程度有	<input type="radio"/> 很有	<input type="radio"/> 極有
7. 您集中精神的能力有多好？	<input type="radio"/> 完全不好	<input type="radio"/> 有一點好	<input type="radio"/> 中等程度好	<input type="radio"/> 很好	<input type="radio"/> 極好
8. 在日常生活中，您感到安全嗎？	<input type="radio"/> 完全不安全	<input type="radio"/> 有一點安全	<input type="radio"/> 中等程度安全	<input type="radio"/> 很安全	<input type="radio"/> 極安全
9. 您所處的環境健康嗎？(如污染、噪音、氣候、景觀)	<input type="radio"/> 完全不健康	<input type="radio"/> 有一點健康	<input type="radio"/> 中等程度健康	<input type="radio"/> 很健康	<input type="radio"/> 極健康
10. 您每天的生活有足夠的精力嗎？	<input type="radio"/> 完全不足夠	<input type="radio"/> 少許足夠	<input type="radio"/> 中等程度足夠	<input type="radio"/> 很足夠	<input type="radio"/> 完全足夠
11. 您能接受自己的外表嗎？	<input type="radio"/> 完全不能夠	<input type="radio"/> 少許能夠	<input type="radio"/> 中等程度能夠	<input type="radio"/> 很能夠	<input type="radio"/> 完全能夠
12. 您有足夠的金錢應付所需嗎？	<input type="radio"/> 完全不足夠	<input type="radio"/> 少許足夠	<input type="radio"/> 中等程度足夠	<input type="radio"/> 很足夠	<input type="radio"/> 完全足夠
13. 您能方便得到每日生活所需的資訊嗎？	<input type="radio"/> 完全不方便	<input type="radio"/> 少許方便	<input type="radio"/> 中等程度方便	<input type="radio"/> 很方便	<input type="radio"/> 完全方便
14. 您有機會從事休閒活動嗎？	<input type="radio"/> 完全沒有機會	<input type="radio"/> 少許機會	<input type="radio"/> 中等程度機會	<input type="radio"/> 很有機會	<input type="radio"/> 完全有機會
15. 您四處行動的能力好嗎？	<input type="radio"/> 完全不好	<input type="radio"/> 有一點好	<input type="radio"/> 中等程度好	<input type="radio"/> 很好	<input type="radio"/> 極好
16. 您滿意自己的睡眠狀況嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
17. 您對自己從事日常活動的能力滿意嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
18. 您滿意自己的工作能力嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
19. 您對自己滿意嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
20. 您滿意自己的人際關係嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
21. 您滿意自己的性生活嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
22. 您滿意朋友給您的支持嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
23. 您滿意自己住所的狀況嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
24. 您對醫療保健服務的方便程度滿意嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
25. 您滿意所使用的交通運輸方式嗎？	<input type="radio"/> 極不滿意	<input type="radio"/> 不滿意	<input type="radio"/> 中等程度滿意	<input type="radio"/> 滿意	<input type="radio"/> 極滿意
26. 您常有負面的感受嗎？(如傷心、緊張、焦慮、憂鬱等)	<input type="radio"/> 從來沒有	<input type="radio"/> 不常有	<input type="radio"/> 一半有一半沒有	<input type="radio"/> 很常有	<input type="radio"/> 一直都有
27. 您覺得自己有面子或被尊重嗎？	<input type="radio"/> 完全沒有	<input type="radio"/> 有一點有	<input type="radio"/> 中等程度有	<input type="radio"/> 很有	<input type="radio"/> 極有
28. 您想吃的食物通常都能吃到嗎？	<input type="radio"/> 從來沒有	<input type="radio"/> 不常有	<input type="radio"/> 一半有一半沒有	<input type="radio"/> 很常有	<input type="radio"/> 一直都有