THE UNIVERSITY OF HULL

The Relationship between Personality and Job Stress, Burnout, Satisfaction and Resilience in Taiwanese Cancer Nurses

being a Thesis submitted for the Degree of PhD

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by

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Acknowledgements

PhD in Nursing? Why do nurses need PhD degrees? That's the question I have been asked for these four years. Until the end of my PhD studying, I still have no perfect answer to convince others who are not nurses. But I know that I am strong enough to keep going in the way of nursing – a tough way; and nursing is one of the most worthy investigation in academic area among human beings because it is just as important as water, air and light. Nursing is related to everyone in daily life, from birth to death.

It is so unreal to come to the end of my PhD, I know that I couldn't have done it without so much support and help. I would like to thank God because he leads me and always prepares me for taking challenges. Although I have often felt depressed and stressed in the UK, I was never afraid of failure, because I know God is there.

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Finally, for myself, it's not the end; it's another start.

Abstract

Aim

The aim of this study is to test the relationship between personality, job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses.

Background

The retention of nurses is a global issue which is closely related to patients' safety and the quality of nursing care. Job stress, burnout and satisfaction influence nurses' intentions to leave their jobs. Job stressors, levels of stress and burnout, coping strategies selection, and influential factors of job satisfaction such as leadership type have been broadly investigated. Personality is the deciding factor in how people perceive the environment and events, and it affects an individual's stress and behaviour in an organization. Resilience has been noted as a mediator of stress. Nurses possessing certain personality characteristics may adapt to their jobs better than others by showing less stress and burnout, and higher job satisfaction. The difficulties of nursing care vary across different specialised contexts; therefore, further research should emphasise specific nursing specialists such as cancer nurses.

Design

Mixed research methods with questionnaire survey and in-depth interview was used.

Methods

The NEO Five Factor Inventory-3 (Coast and McCare, 1992), the Nurse Stress Checklist ; (Benoliel, 1990; translated into Chinese by Tsai, 1993), the MBI-Human Services Survey (Maslach et al., 2001), the Nurse's Job Satisfaction Scale (Lin et al., 2007b) and the Brief Resilience Scale (Smith et al., 2008) were selected as the

measurement tools in this research. An interview guideline was developed based on the components of selected questionnaires to check the validity of the questionnaires and to investigate significant relationships in the statistical results. T-test, Pearson's correlation, ANOVA (analysis of variance) and structural equation modelling (SEM) were used to test the relationships between variables; content analysis was used to analyse interviews.

Results

Cancer nurses' personality successfully predicted their resilience, stress, burnout, job satisfaction and intention to stay. Personality especially explained resilience, stress and burnout. Nurses' resilience acted as a negative mediator to burnout, while stress mediated burnout positively.

Conclusion

A personality test could be used in recruiting nurses, making nursing career plan and proposing effective interventions to increase nurses' resilience and diminish nurses' stress and burnout. Further studies in other nursing professionals are needed.

This research was reported as an oral presentation in the 14th European Doctoral Conference in Nursing Science at Maastricht University.

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List of Abbreviations

Abbreviation	Description
16PF	Sixteen personality factor questionnaire
A	Agreeableness
AIC	Akaike Information Criterion
AGFI	Adjusted-Goodness-*of-Fit Index
ANOVA	Analysis of variance
AMOS	Analysis of moment structures
BRS	Brief resilience scale
C	Conscientiousness
CFI	Comparative Fit Index
DP	Depersonalization
E	Extraversion
EE	Emotional exhaustion
GFI	Goodness of Fit Index
ICU	Intensive care unit
IFI	Incremental Fit Index
MBI	Maslach's Burnout inventory
MBI-HSS	Maslach's Burnout inventory - Human Services Survey
MBTI	Myers-Briggs Type Indicator
ML	Maximum liklihood
N	Neuroticism
NEO-FFI	NEO Five-Factor Inventory
NEO-FFI-3	NEO Five Factor Inventory-3
NEO-PI-3	NEO Personality Inventory-3
NEO-PI-R	NEO Personality Inventory- Revised
NFI	Normed-Fit Index
NJSS	Nurse's Job Satisfaction Scale

NSC	**Nurse Stress Checklist**
O	**Openness to Experience**
PA	**Personal accomplishment**
PROSCAN	**Professional Dynametric Programme System Inventory**
QDAS	**Qualitative Data Analysis Software**
RFI	**Relative Fit Index**
RMSEA	**Root Mean Square Residual**
SE	**Standard error**
SEM	**Structural Equation Modelling**
SD	**Standard deviation**
SRMR	**Standardised Root Mean Square Residual**
TLI	**Tucker-Lewis Index**
TRT	**Test-retest reliability**
UTI	**Urinary tract infection**

Chapter 1 Introduction

This study aims to investigate the relationships between personality, job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses. The research steps will be shown by giving the background information and conceptual framework first; second, relevant literature including theoretical identification, and associated research results; a systematic review will be presented. Next, a methodology chapter will describe a sequential mixed research method with questionnaire survey followed by in-depth interview; the ethical considerations, sampling, data collection methods and survey instruments. The quantitative data were analysed using SPSS for inferential statistics, and using AMOS for path analysis by using structural equation modelling (SEM) to explore the relationships between variables; the qualitative data were analysed in content analysis. Subsequently, results are presented in two parts: 1) quantitative statistic results of significant relationships and best-fit model which indicate relationships among variables; 2) qualitative themes which support the respective dimensions included in the questionnaires and reflecting specific relationships in quantitative results. Afterward, the significant findings of quantitative and qualitative strands with possible explanations, comparison between this study and previous studies, how the qualitative results reflect quantitative results, strength and weakness of this study are presented in the discussion chapter. Finally, implications of the research and suggestions for future research are made in the conclusion chapter.

1.1 Rationale

Nurses take one of the most important roles in a healthcare team, and they are also the largest number of employees in a hospital (Witkoski and Dickson, 2010). Nurse retention is an imperative issue in many countries and many investigations have been carried out to understand what factors influence nurse turnover (Borda and Norman, 1997; Yin and Yang, 2002) and what effective interventions for retaining competitive nurses are (Lartey et al., 2014). The loss of nurses may have an impact

on the operation and public image of a hospital, causing dangers to the safety of patients (Aiken et al., 2001), and diminishing the quality of nursing care (Shader et al., 2001; Waldman et al., 2004; Morrell, 2005).

According to the investigation sponsored by the Department of Health, Executive Yuan of Taiwan, the turnover rate of clinical nurses rose from 22.19% in 2001 to 28.02% in 2004 (Chen, 2006). A similar situation occurred in the United States where the turnover rate of hospital nurses rose from 15% in 1996 (Anon, 2001) to 26.2% in 2000 (Hospital and Healthcare Compensation Service, 2000-2001, cited in (Larrabee et al., 2003) according to a national investigation. In February 2011, the National Union of Nurses' Associations in Taiwan gathered statistics showing that the number of registered nurses who hold licenses is 254,494 and the number of certificated nurses in clinical practice is 147,752 (Anon, 2015). Only 60% of the licensed nurses stay in the professional field of nursing. In addition, the national health insurance system in Taiwan, which led to the decrease in nurse numbers and nurses' salaries, also made the work environment and conditions worse for nurses. Nursing manpower displays a phenomenon of shortage because the turnover rate is high and nurses choose not to stay in their professional areas. These emerging problems necessitate the study of effective actions for retention of nurses.

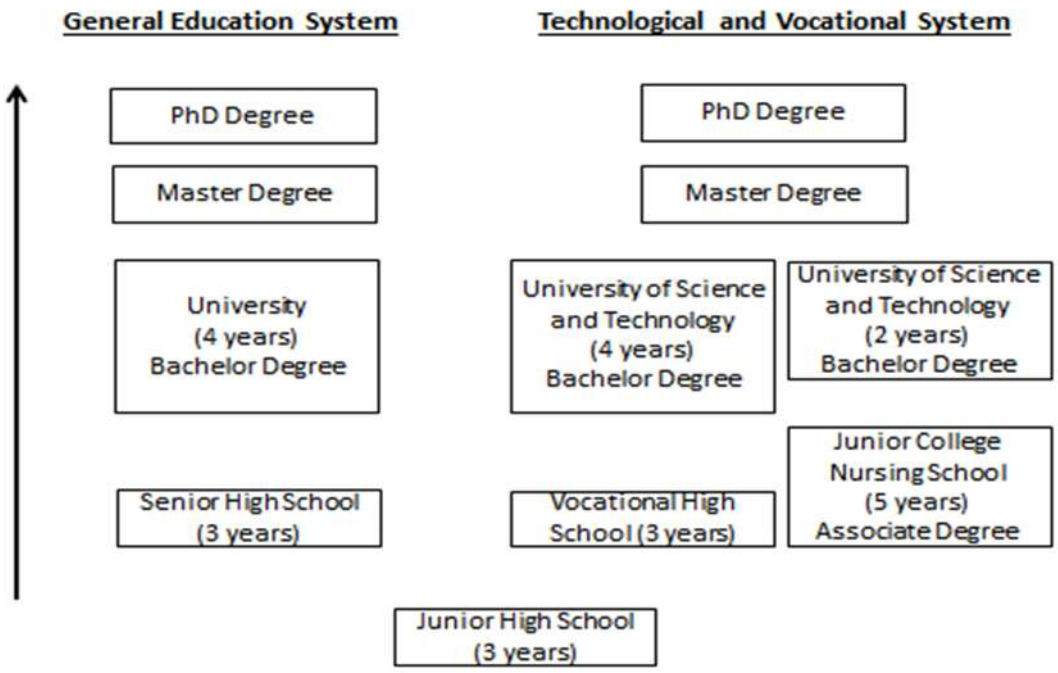
How to recruit, manage and maintain nurses is an important issue for hospitals and patients because the nurses' turnover may have a negative influence on the continuation of nursing care, the relationship between patients and nurses, patients' safety, the cost of personnel matters and training, the expense of making up for mistakes, and making other colleagues feel demoralised and disrupted in social communication (Staw, 1980; Pearce and Porter, 1986; Levin and Kleiner, 1992; Cohen-Mansfield, 1997). In addition to the work environment, salary and government policy issues stated above, individual factors influence nurses' turnover such as commitment (De Gieter et al., 2011; Gellatly et al., 2014), stress/stressors (Zeytinoglu et al., 2006), job satisfaction (Irvine and Evans, 1995;

Griffeth et al., 2000; Coomber and Louise Barriball, 2007; De Gieter et al., 2011), burnout (Griffeth et al., 2000; Hudgins, 2015) and resilience (Hudgins, 2015) have been largely investigated. Personality, job stress, burnout and satisfaction are seen as important indices for reference in organizational personnel management (Fincham and Rhodes, 2005). Personality is regarded as an objective and reliable construct when recruiting staff (Fang, 2002). Job stress, burnout level and satisfaction among nurses are important variables which are negatively correlated with their intention to leave (Shih, 1994; Larrabee et al., 2003).

1.2 The Background of Taiwanese Nursing

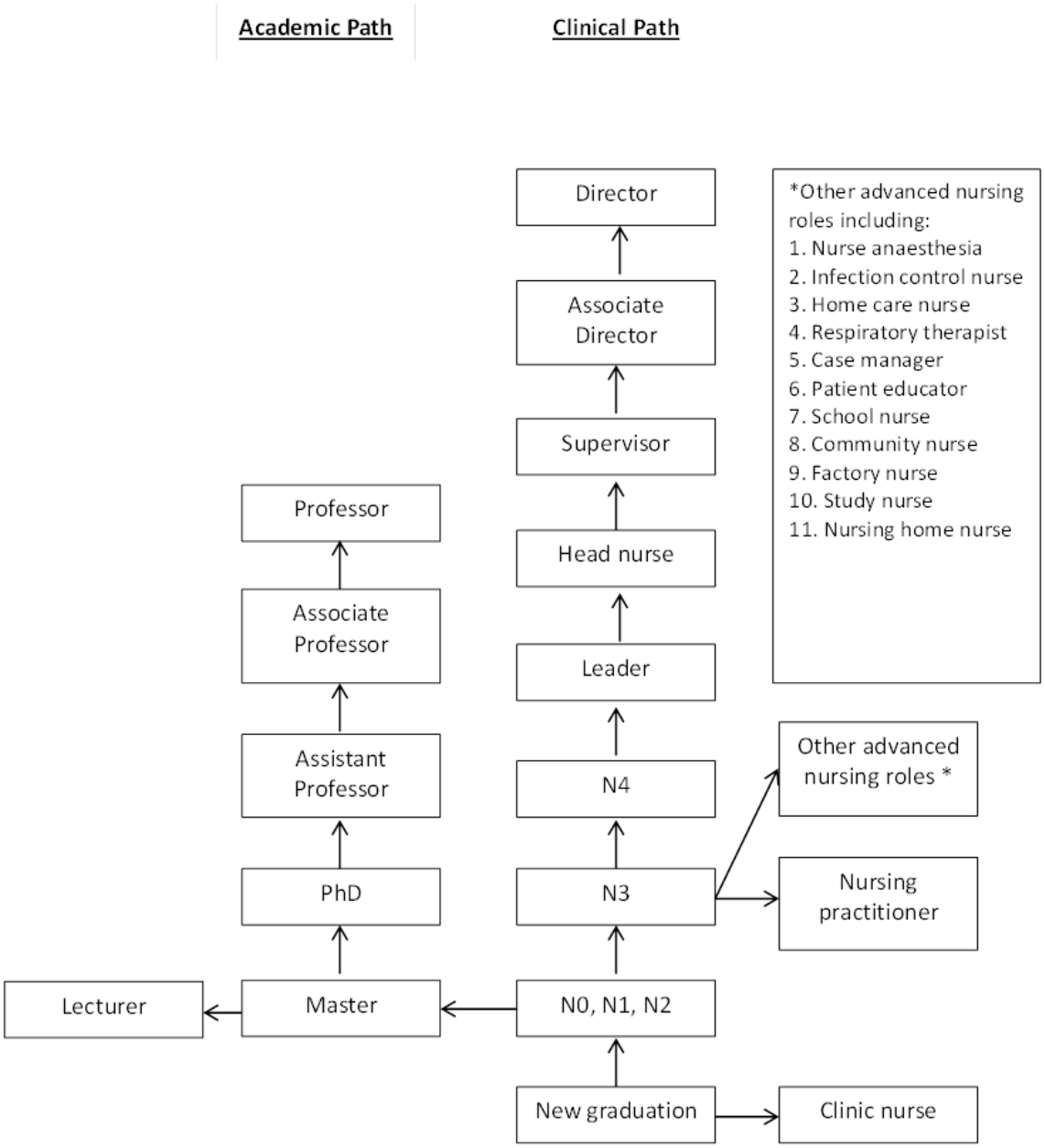
The nursing education system in Taiwan is shown in Figure 1. There are two higher education systems in Taiwan: general education system; and technological and vocational education system. Nursing students who are studying in junior college may apply to be admitted into the second year of university in the general education system. Nurses with bachelor degrees are able to apply for masters and PhD degrees in both systems. Most nursing students are self-funding, only a few students have scholarships offered by individual hospitals or religious universities. Due to the implications of 12 years compulsory education in Taiwan since 2014, the number of junior college students is diminishing. In the past, nursing students who graduated from nursing vocational high school and junior college could take the national exam to obtain Registered Nurse licences; and nursing students with bachelor degrees could obtain Registered Professional Nurse licences. Registered Nurses are only allowed to work as clinical nurses and nurse assistants. According to the needs of the clinical environments and the overall promotion of nursing education level to bachelor degree, the government stopped the exam for Registered Nurse in 2013 (Li et al., 2008; Yeh, 2014).

Figure 1 Nursing education system in Taiwan



Taiwanese nurses' career path is shown in Figure 2. There are two main paths in nursing careers: clinical path; and academic path. When new graduates start their works in hospital, they are placed on the clinical ladder as N0, which indicates that they are novices/beginners in nursing. After one year, if they attend certain hours of continuous nursing education or conferences and also pass the exam held by nursing department in hospitals they work in, they can upgrade their ladder place to N2; N2 nurses are advanced beginners. N3 nurses must pass the case report exam held by the Taiwan Nurses Association; and N4 nurses must pass the nursing project exam of (aiming to improve clinical nursing processes) or have publications in nursing research. N3 nurses are considered as competent and N4 nurses are seen as proficient in clinical care. Nurses who are recognized as competent can change their positions into nursing practitioners in their specialist areas or other advanced nursing roles by completing specified training courses and becoming qualified with specialized licences. Nurses who decide to work as nursing teachers follow the academic career path from lecturers to professors. The career path below was developed on the base of an online report (Chiang-Hanisko, L. et al., 2008) and personal experience also observation in work.

Figure 2 Nursing career path in Taiwan



1.3 Research Interest

As a cancer nurse, stressful situations happened in every work day and burnout came to me and my colleagues; depression is also familiar to cancer nurses. However, some nurses survive and stay in cancer caring, but some leave the cancer area or nursing. Therefore, exploring what influences nurses' intention to stay or leave at a personal level is a priority. This study was designed to investigate the

relationship between personality and job stress, burnout, satisfaction and resilience in cancer nurses because they may face specific stressors or difficulties in their jobs, which causes job burnout frequently in this group. The stressors include exposure to risks such as chemical agents, and facing difficult care-related circumstances, like seeing patients suffering. Primary stressors in terms of psychosocial problems are watching patients or families suffering, and deaths and dying of patients (Hinds et al., 1990; Emery, 1993; Bond, 1994; Cohen et al., 1994; McCarron, 1995; Kushnir et al., 1997; Hinds et al., 1998; Hollen et al., 2000; Isikhan et al., 2004; de Carvalho et al., 2005). In Taiwan, cancer patients have become the biggest contributors to death statistics since 1982 (Anon, 1982).

Personality traits influence an individual's behaviour directly, and the traits are stable and consistent over time (Matthews et al., 2009). Personality profiles can indicate how workers usually respond to the situations that are created by their occupational roles, and the workers with some kinds of personalities have better performance than others (Roe, 1956). McVicar (2003) pointed out the influence of workplace stress in the workforce, emotional exhaustion and job disagreement. It was concluded that stressors could be different in diverse practice areas, and personal factors like stress 'hardiness' should be considered as well as the fact that stress level could be affected by individual's coping strategies. Therefore, nurses who possess certain personalities may make them to be more competent for some specific specialised areas (Meeusen et al., 2010; Meeusen et al., 2011). In a nursing career, job satisfaction is believed to be positively correlated with work performance, intention to stay, professional commitment, outcome and quality of patient care no matter directly or indirectly (Shih, 1994; Aiken et al., 2002; Lin et al., 2007a). In the field of occupational psychology, job satisfaction, stress and burnout has been shown to have strong correlation to the prediction of intention to leave or job turnover rate (Lum et al., 1998; Griffeth et al., 2000; Maslach et al., 2001; Larrabee et al., 2003; Zeytinoglu et al., 2006; De Gieter et al., 2011).

Selecting nurses by their personality traits could be an effective method to promote

the level of job satisfaction and their work performance. However, before organizations use personality traits as a tool in selecting nurses, the relationship between personality and job satisfaction needs to be studied (Meeusen et al., 2010). Bryant (1994, cited in Burgess, 2010) suggested that certain critical care nurses who have advantageous personality characteristics are tougher and better in adapting to their jobs. In addition, Tummers et al. (2002) claimed that the levels of emotional exhaustion in ICU nurses were not higher than those in nurses in general wards. This unexpected observation may result from the influence of the personality characteristics of intensive care unit (ICU) nurses. Therefore, personality traits should be a crucial and determining factor of nurses' job satisfaction, levels of stress and burnout.

1.4 Research Question

Several studies have investigated the relationship between personality and job satisfaction, stress and burnout in pairs or in triple (Eastburg et al., 1994; Zellars et al., 2000; Buhler and Land, 2003; Garrosa et al., 2008; Burgess et al., 2010; Chang et al., 2010; Garrosa et al., 2010; Meeusen et al., 2010; Hudek-Knezevic et al., 2011; Meeusen et al., 2011); and no study focused in cancer nurses in adult cancer ward or without identified the sample were recruited from which specialist ward (Eastburg et al., 1994; Zellars et al., 2000; Gillespie et al., 2007; Garrosa et al., 2008; Garrosa et al., 2010). Most prior studies aimed to explore categories of nurses' personality, levels of job satisfaction, stress, burnout and sequence of stressors. Thus, how strongly personality traits influence nurses' perception of job satisfaction, stress and burnout needs to be further investigated. Many investigations of nurses' satisfaction, stress, stressors and burnout in western world have been carried out, but samples selected from Taiwanese nurses are who stand in the entirely different cultural background of the Asian area are few. Competitive models will be used to decide the best-fit model which may present the direction of relationships from personality to stress, burnout, job satisfaction and resilience; and the model will present the relationships among the other variables as well. Face-to-face interviews were designed according to selected

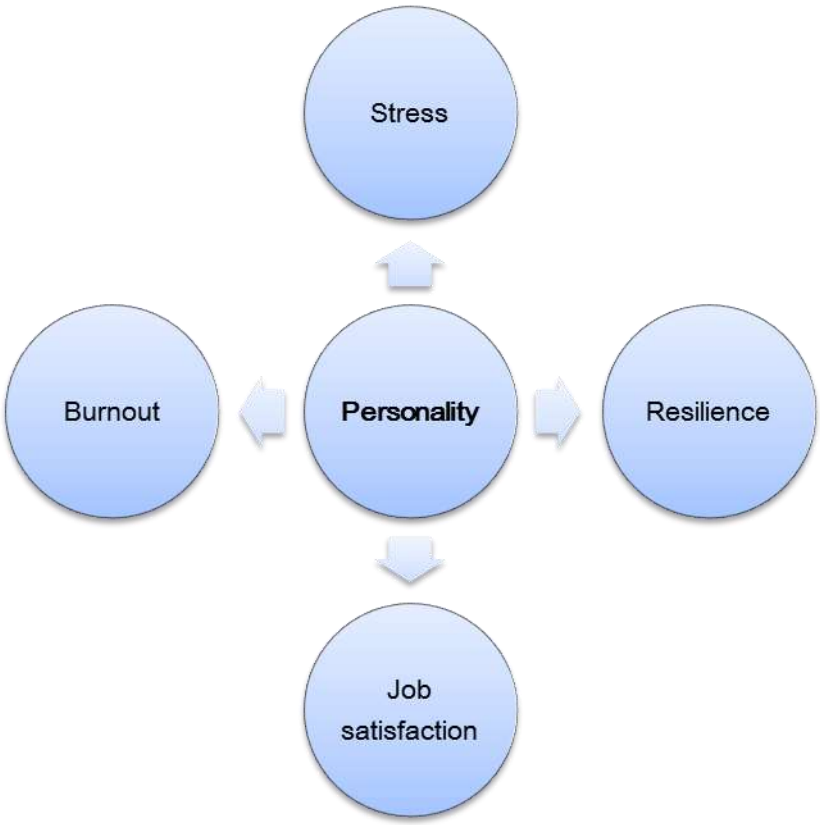
questionnaires and used to valid the questionnaires and underpin the significant findings in questionnaire survey. Furthermore, this study focused on cancer nurses specifically. Therefore, this is a brand-new study, and the research question is formed:

> What is the relationship between personality traits and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses?

1.5 Conceptual Framework

This research aimed to explore the relationship between personality, job stress, burnout, satisfaction and resilience. The initial conceptual framework is represented in Figure 3. Nurses' personality traits influence their stress, burnout, job satisfaction and resilience, and stress, burnout, job satisfaction and resilience influence each other in pairs.

Figure 3 The Relationship between Personality, Stress, Burnout, Job Satisfaction and Resilience



Chapter 2 Literature review

The main purpose of a literature review is to discover the existing evidence in the selected research field and to address how the research question has been investigated so far. A review of the theories of personality, stress, burnout, job satisfaction and resilience was conducted. A systematic literature review was conducted to answer the research question: 'what is the relationship between personality, stress, burnout, job satisfaction and resilience in nurses?' and is presented in this chapter. Electronic databases often used in nursing including OVID-SP, CINAHL, PubMed, Cochrane and Google scholar were searched for items in English. Citation searching was also used.

2.1 Theoretical Background of Personality, Job Stress, Burnout, Job Satisfaction and Resilience

This section will offer a background review of theory in personality, stress, burnout, job satisfaction and resilience.

2.1.1 Personality Traits

The Definition of Personality Traits

Personality is described by Ryckman (2004) as a dynamic and organised set of individual characteristics that uniquely influence an individual's cognition, motivation, and behaviour in diverse situations. In the *Diagnostic and Statistical Manual -IV-TR* (Widiger, 2000 , p.686), published by the American Psychiatric Association, personality traits are defined as 'enduring patterns of perceiving, relating to, and thinking about the environment and oneself that are exhibited in a

wide range of social and personal contexts'. Psychiatrists mostly agree that personality traits possess three characteristics: they are sustained, stable, and unique to an individual, and can induce different behaviours in each individual.

Although psychiatrists have devoted considerable time to addressing the integrity, definition and content of personality, they fail to agree. Personality is thought to be continuous persistence of special characteristics, which make individuals different and distinguishable from others (Guilford, 1959). The formation of personality can be seen as the accumulation of individuals' responses to their lives in a process of psychological growth and development based on genes and environment. For instance, personal neural function is influenced by DNA and social-cognition (Scot and Mitchell, 1972; Matthews et al., 2009). Allport (1937; 1961) proposes that personality characteristics interact with the personal environment, which is a dynamic organised psychological system. This dynamic system can reflect and influence personal behaviour, thought and adaptation to the environment. When those characteristics show up in various situations continuously, they are called personality traits. Two key assumptions of the theory of personality traits are: 1) personality traits are stable, and this stability can distinguish traits from other temporary characteristics of individuals such as mood status in a specific timeframe; 2) personality traits influence personal behaviour directly (Matthews et al., 2009).

The Development of Personality Traits

Personality traits are used broadly in various areas, such as education, leadership and business. In education, many studies related to personality have been done. For instance, personality was used in predicting students' academic motivation and achievement (Komarrajua and Karaub, 2005; Komarrajua et al., 2009; Clark and Schroth, 2010); and the relationship between personalities, learning styles and achievement in higher education has been investigated (Busatoa et al., 1998; Farsidesa and Woodfieldb, 2003; Komarraju et al, 2011). In terms of leadership,

how personality determines transformational and transactional leaderships was explored in a meta-analysis (Bono and Judge, 2004); and the correlation between personality and leadership was confirmed in a meta-analysis paper which included both quantitative and qualitative research (Judge et al., 2002). Personality has also been used in explaining overall job satisfaction (Judge et al., 2002), job performance (Tett and Burnett, 2003) and career success (Judge et al., 1999). For organizations, personality is used in selecting employees or cadres, and for career planning or development.

Psychiatrists have tried to extract personality traits from language by lexical studies and the first step is finding out how to measure and classify the traits. Due to the application of statistical factor analysis, personality traits become measurable in the form of scientific conceptions without neglecting the correlation between each trait. The second step is to test the correlation between traits and actual behaviour. For example, in Mehl et al.'s (2006) research, people who possess the traits of extraversion tend to spend more time in conversation and getting along with others. Carr and Kingsbury (1938, cited in Matthews et al., 2009) brought out the notion of traits: traits cannot be observed directly but can be deduced from the individual's behaviour. Also, they deemed that traits are good predictors of future behaviour. This opinion was echoed by McCrae et al. (2000) that traits must be inferred from sound indicators such as personal behaviour or experience; it is hard to identify the traits by direct observation. For the purpose of knowing the personality traits of different individuals on an objective and universal base, valid trait measurements are needed.

A variety of inventories have been developed for several purposes. Some approaches were used in measuring constructions of specific personality theories; others aim to predict outcomes such as occupational success (Coast and McCare, 2006). The study of personality traits started in 1936 when Allport and Odbert listed traits by name in English, followed by Cattell, Eber and Tatsuoka (1970, cited in Matthews et al., 2009) who developed the Sixteen Personality Factor

Questionnaire (16PF) by dividing those terms into groups of synonyms. Then McCrae and Costa (1976; 1978) analyzed the 16PF scales and extracted three domains of universal personality: Neuroticism (N), Extraversion (E) and Openness to Experience (O). According to these three domains, McCrae and Costa developed scales to measure traits by surveying the facets of N, E and O (Costa and McCrae, 1980); later; they recognised Agreeableness (A) and Conscientiousness (C) as two additional major domains (Costa Jr and McCare, 1985) and formed the Revised NEO Personality Inventory (NEO-PI-R) (Costa et al., 1991). The five factors (the Big Five) have the greatest agreement by psychiatrists as being the broadest dimensions of personality traits, and are compared with Eysenck's (Eysenck and Eysenck, 1975, cited in Costa and McCrae, 2006), Guilford's (Guilford et al., 1976, cited in Costa and McCrae, 2006), Cattel's (Cattel et al., 1970, cited in Costa and McCrae, 2006) and other systems such as those proposed by Buss and Plomin (1975, cited in Costa and McCrae, 2006); finally, Costa and McCrae (2006) concluded that the five factors have more agreement on higher order factors (especially N and E). The NEO-PI-R is one of the most used psychological instruments when appraising personality traits of the Big Five model in various areas. Despite this, the 16PF is still administered in contemporary studies, but it is criticised by psychiatrists on the grounds that its internal consistencies are not high (Matthews et al., 2009). Therefore, the 16PF was not used in this study.

Costa and McCrae (2006, p. 31) consider that traits are arranged hierarchically from very broad to very narrow and that 'both highly general levels (domain) and relatively specific levels (facet)' need to be assessed as is performed by the NEO-PI-R. Two form of the NEO-PI-R exist: Form S for self-report and Form R for observer rating. Both forms are shown to have good reliability, stability and validity (Costa and McCrae, 2006).

Stability is one of the most important characteristics in making personality traits acceptable to scholars as an effective tool for predicting behaviour, and the traits must be distinguished from transient properties such as personal mood over a

short period, or being subject to a special event. Although personality is considered to change slowly with ageing or to be affected by health or psychosocial status, it is still expected to reach high stability over one year or more. The stability of a measure also relies on the users choosing appropriate and reliable trait assessments (Matthews et al., 2009). McCrae et al. (2000) stated that mean trait levels of adults slightly increase in agreeableness and conscientiousness from age 18 to 30; in contrast, the level decreases in the remaining three traits: neuroticism, extraversion and openness. The same research also indicated that the mean levels are unchanging after the age of 30 (Matthews et al., 2009). The exception happens when individuals experience major life changes or strive to change themselves (McCrae et al., 2005). Another factor considered to have an impact on personality traits measurement is stressful events; Costa and McCrae (1977) reported that temporary stresses influence the level of neuroticism. McCrae (1993) suggested that the change of normal adults' personality with time may be due to measurement error, not intrinsic change.

The Big Five (Five Factor Model) Personality

Personality inventories involve questions about how people react to situations rather than asking people to answer about to what dimensions of personality they belong. The Big Five factors are expanded and identified by several independent researchers as a basic structure of several personality trait inventories with high inter-correlation (Digman, 1990). The Big Five has the highest consensus among psychologists on capturing the comprehensive variances in different personality measurements developed from diverse theories (O'Connor, 2002). However, the Big Five has still been criticised for being developed on the basis of empirical data-driven research rather than on theory-driven research (Matthews et al., 2009).

Goldberg (1993) describes the Big Five factors as follows:

Neuroticism is related to personal perception like calmness, security, or emotional stability. Individuals who have higher neuroticism experience negative emotions more than others and the responses include anger, sadness, fear, guilt etc. Neuroticism not only enhances the vulnerability to suffering of people, but also affects their ability to adapt or cope.

Extraversion can be recognised if people are sociable, fun-loving, and warm. People who possess extraversion like social activity more, and they enjoy spending time with other people. They are more confident, conversational, pleasant, excitement-liking, optimistic and energetic.

Openness means the variety and depth of an individual's interests, and their tendency to be imaginative, independent, and open-minded. The characters of open-minded people are full of imagination; they are sensitive to arts, focus on internal feeling, thirst for knowledge, like diversification and are independent in judging true and false. The person who has lower openness has conservative thinking and behaviour, and prefers familiar circumstances to novelty.

Agreeableness is seen as being soft-hearted, trusting, and willing to help others. In connection with interpersonal tendencies, higher agreeableness means that people tend to be altruistic, obliging and sympathetic.

Conscientiousness is shown from personal efficiency in organization, concern for others, and discipline; it can be referred to the ability of self-control, such as in dealing with desire; planning, being organised and implementing plans.

Nevertheless, extremely high or low levels of each facet indicate potential abnormal behaviour in some circumstances. To cite an instance, especially high level of conscientiousness of an employee or academic may lead to great

achievement and success; on the other hand, highly conscientious people are likely to be hypercritical or have mysophobia.

In the NEO-PI-R, each domain of traits contains six facets (in Table 1). From Table 1 below, six facets of each trait in the five factor model proposed by Costa and McCrae will be presented (Matthew et al., 2009, p.25).

Table 1. Trait Facets Associated with the Five Domains of the Costa and McCrae Five Factor Model of Personality

Neuroticism (N)	anxiety, anger hostility, depression, self-consciousness, impulsiveness, vulnerability
Extraversion (E)	warmth, gregariousness, assertiveness, activity, excitement-seeking, positive emotions
Openness to experience (O)	fantasy, aesthetics, feelings, actions, ideas, values
Agreeableness (A)	trust, straightforwardness, altruism, compliance, modesty, tender-mindedness
Conscientiousness (C)	competence, order, dutifulness, achievement striving, self-discipline, deliberation

Costa and McCrae and other professionals have carried out abundant empirical research on the NEO-PI-R and shown the congruity and association with other personality instruments based in 'The Big Five'.

Block (1995) argued that the Big Five cannot give a complete explanation of human personality, because five factors seem to be too few to represent the major dimensions of personality. In addition, there may be some factors beyond the Big Five such as honesty, negative valence and religiousness (Matthews et al., 2009). However, those arguments remain debatable and the Big Five has shown its prominence and consistency in personality measurement.

Personality profiles can indicate how workers usually respond to the situations that are created by their occupational roles, and how workers with certain kinds of personality have better performance than others (Roe, 1956). The Big Five is recommended in organizational psychology research in terms of exploring the correlation between personality and contextual performance, vocational choice, career progression and change, work satisfaction and stress (Tokar et al., 1998; Matthews et al., 2009).

In general, neuroticism is highly related to the stress response in work content, and it can be a good predictor of work stress (Furnham, 1992; Tokar et al., 1998). Moreover, employees who have higher neuroticism and lower level of conscientiousness tend to change their jobs more (Barrick and Mount, 1996; Tokar et al., 1998). Workers with higher conscientiousness usually represent good organizational citizenship and try hard to achieve the organization's goal (Lepine et al., 2002). People who are agreeable usually interact with other colleagues in more constructive ways (Tett and Christiansen, 2008), and those who are extravert may perceive higher job satisfaction (Brief, 1998).

Presumably, personality traits influence how people perceive and interpret things, and react in the working environment. Job satisfaction, stress and burnout involve perception, cognition, interaction and response to the organization and are related to the intention to change job. Therefore, tests of personality traits can be administered to predict workers' job satisfaction, stress and burnout levels.

Other personality measurements can be used such as the Myers-Briggs Type Indicator (MBTI), 16PF and the hardy personality. But the MBTI is criticised as lacking empirical investigation, the 16PF is complex in category and explaining types of personality, and hardy personality focuses on how an individual perceives the events and what possible coping strategies are used. The NEO-FFI-3 is based on the most popular version of the 'Big Five' theory which has achieved a high degree

of consensus and acceptance from psychiatrists; and it possesses high validity and reliability over different ages, genders, cultures and languages with only 60 short items. Therefore, it is the most appropriate personality measurement for the present research. The developing process, the results of internal consistency and test-retest reliability are reported in the methodology chapter (Chapter 3).

2.1.2 Theoretical Background and Relevant Literature of Job Stress

The Definition of Job Stress

Job stress is defined as a threat 'to the health of working people and to the healthiness of their work organizations' (Cox and Griffiths, 2002, pp.1). Job-related stress can affect an individual's physical or psychological health status and work behaviour. In terms of its influence on an organization, employees' absenteeism rises; in the meanwhile, their enthusiasm, organizational commitment and work accomplishment decreases (Fincham and Rhodes, 2005). These imbalanced conditions may lead to a decline in the quality of care (Kendrick, 2000; Grunfeld et al., 2005; Milliken et al., 2007) and affect decision-making in health care service; and also risks causing more accidents. Whether stress becomes a crisis or not, depends on how effective the individual's coping strategies are. Alternatively, stress can motivate individuals to grow; on the other hand, boredom and lack of interest can appear in work with too little stress (Cohen et al., 1994; Cox and Griffiths, 2002); boredom can also make employees leave their jobs.

Stress and stressors can be confused sometimes. Stress can be defined in different ways; Matthews et al. (2009) give a brief definition. Stress can be expressed as a stimulus (or 'stressor') which is a threatening event from the outside, and sometimes the event can cause damage (Baum, 1990). Three main categories of stressors are recognised: natural disasters, personal cataclysmic events and daily hassles (Lazarus and Cohen, 1977). Second, stress is seen as a response (strain)

which can reflect an individual's emotional, cognitive and physical reactions. Thirdly, stress is a process (transaction) which emphasises the fact that different individuals may be impacted by the stressor or strain on various levels. The strength of the impact is decided by both personal characteristics (e.g. personality or past experiences) and environmental factors related to the stressors. In the transactional model, the processes usually involve some coping strategies. In this research, the transactional stress model is selected.

Stress in Cancer Nursing

Nursing has been reported as one of the most stressful jobs among health care providers (Rees and Cooper, 1992; Kash et al., 2000; Isikhan et al., 2004); the content of nursing care changes rapidly and nursing work becomes quite stressful (Humpel and Caputi, 2001). Cox et al. (1996) have summarised the stressors in nursing from various literature reviews, such as work overload, dealing with death and dying, conflict with colleagues, lack of support and staff shortages etc. Nurses' job stress, stressors, stress response, coping behaviours and strategies and job stress-related factors have been investigated in Taiwan; the sampling groups included general nurses, intensive care unit nurses, cancer nurses, hospice nurses, nurses in long-term care institutions and nurses caring for Severe Acute Respiratory Syndrome (SARS) patients (Lin, 1991; Su, 1993; Tsai, 1993; Yeh, 1995; Chen et al., 1997; Cheng et al., 1999; Hung et al., 2002; Feng et al., 2003; Pan et al., 2003; Tsai and Li, 2003; Lee, 2005). Two studies (Lin, 1991; Yeh, 1995) are related to the stressors and coping strategies of Taiwanese cancer nurses. In comparison with the research results among Western countries and Taiwan, the main difference is that the Taiwanese cancer nurses say that their stressors mostly come from the dimension of caring for patients, whereas Western cancer nurses not only have the similar stressors, but also they consider that other stressors come from the mismatching of personal needs.

Multiple causes, including institutional, personal and professional can lead to work

stress reasons (Costantini et al., 1997). Nurses feel powerless when watching patients or their families suffer but the nurses are unable to do anything to ease the patients' discomfort; or the treatment does not work and there is no cure (Emery, 1993; Bond, 1994; Cohen et al., 1994; Hinds et al., 1998; de Carvalho et al., 2005). Sometimes the patients refuse to receive appropriate treatment, causing the nurses to feel powerless (Pearce, 1998). When nurses think that they should give more aggressive treatment to patients to avoid the patients' deaths, they find it hard to let the patients go (Bond, 1994). These stresses can form because the nurses are close to the patients who are suffering or dying (McCarron, 1995; Isikhan et al., 2004). Not only do death and dying make nurses experience stress, but seeing cancer patients relapse also gives them the same feeling (Emery, 1993; Bond, 1994; Cohen et al., 1994; de Carvalho et al., 2005). Distrust and disrespect from patients produces stress in nurses; also, stress comes when nurses are dealing with problems between patients and their relatives (Bond, 1994; Isikhan et al., 2004; de Carvalho et al., 2005). The feelings of being unaccepted and unvalued by their colleagues, managers, institutions and society reveal that nurses work in an environment that is not supportive enough (Kushnir et al., 1997; Pearce, 1998).

Nurses hope to get support from other staff when they make complex care decisions. Experienced nurses feel stressed when they lack the necessary resources for support (Hinds et al., 1994). When they want to help a patient but wait too long or cannot communicate well with the physicians about how to help patients, the nurses feel that their stress level increases (Bond, 1994; Hinds et al., 1994; Escot et al., 2001; de Carvalho et al., 2005). Stress arises if nurses have conflicts about treatment decisions with physicians; nurses also feel isolated from the medical decision-making processes (Kushnir et al., 1997; Pearce, 1998; Isikhan et al., 2004). Other stressors in the co-workers' dimension are associated with nurses thinking that some of their colleagues are incompetent (Bond, 1994; Hinds et al., 1998); on the other hand, being considered incompetent by colleagues put nurses under stress (Cohen et al., 1994). Some nurses have high self-demand personalities and perceive stress when they worry that some colleagues seem not to think that high-

level quality of care is important (Hinds et al., 1994). Lack of equipment puts nurses in a thwarted and stressful work environment. Equipment includes tools and materials in the institution. In the medical work environment, equipment is essential. Nurses give high scores to stress statements when equipment and supplies are not available (Isikhan et al., 2004; de Carvalho et al., 2005).

Problems regarding lack of time, excessive workload and short staffing appeared in previous investigations; nurses have too many tasks, and those tasks in cancer care are complex (Emery, 1993; Cohen et al., 1994; Hinds et al., 1994; Hinds et al., 1998; Callaghan et al., 2000; Escot et al., 2001). Nurses convey the feeling that they cannot get all the work done and they spend a long time in hospital and at work (Kushnir et al., 1997; de Carvalho et al., 2005). Insufficient time for nurses to play other roles outside hospital, as parents and spouses, or to have leisure time to spend with friends; all make the nurses' stress become chronic and cyclical. Changes from day to night work result in physical, emotional and social life changes among nurses (Hinds et al., 1994). Physically, they may experience difficulty in falling asleep or poor quality in sleeping; in the emotionally, nurses on night shift may get angry easily; and socially, nurses may have difficulty in maintaining their normal social activities. Stressors arise from the life-work imbalance, but the stress experienced still depends on the characteristics of nurses. Some nurses mentioned a lack of balance between their roles, and that having to balance their work and other outside responsibilities is extremely difficult (Cohen et al., 1994; McCarron, 1995; Kushnir et al., 1997; Isikhan et al., 2004). Some nurses would like to spend more time or energy in caring for cancer patients; however, they perceive that their children and spouses need them as well as the patients.

Management and administration can influence the stressors experienced by nurses, too. Three conditions in management make nurses feel stress: when the ward manager lacks ability at administration, for example, when the staffing arrangement by the head nurse are inadequate (Lin, 1991; Cohen et al., 1994); a

lack of awareness from the leaders (Hinds et al., 1994); and unfair opportunities offered for nurses' promotion (Isikhan et al., 2004). Beside, when nurses take responsibility for administration, they experience more stress than those who do not (Callaghan et al., 2000).

Nurses feel guilty when they make mistakes. Indeed, those mistakes become stressors in their work (Bond, 1994; Hinds et al., 1994; de Carvalho et al., 2005). Especially, they fear that making mistakes can influence the patient's prognosis, cause the death of patients or inflict irreversible damage on patients. Lack of knowledge can induce mistakes (Escot et al., 2001). Nurses detect this problem of knowledge insufficiency when they cannot tackle difficult situations (Cohen et al., 1994). If the nurses do not feel comfortable with their skills, it enlarges their perception of stress (de Carvalho et al., 2005).

Quantitative approach and self-report questionnaires are the dominant research method and instrument in the investigation of occupational stress. Several measurements are designed for testing the stress level or the sequences of stressors. For instance, Rodney (2000) applied the stress section of the Mood Adjective Checklist devised by Mackay et al. (1978) to investigate the stress of nurses who care for dementia patients and the relationship between nurses' stress and hardiness, cognitive appraisal and coping.

The Nurse Stress Checklist (NSC) was selected for this study; it was developed by Benoliel et al. (1990) for the purpose of measuring nurses' stress in clinical settings. More details of reliability in Chinese version NSC (Tsai, 1993; Tsai and Chen, 1996) will be given in next chapter.

2.1.3 Theoretical Background and Relevant Literature of Job Burnout

The Definition of Job Burnout

Chronic and prolonged interpersonal stressors in a job context can lead to psychological symptoms such as overwhelming exhaustion, cynicism (depersonalization) and reduced efficacy or accomplishment. Job burnout is represented in three dimensions: individual (exhaustion), interpersonal (depersonalization) and self-evaluation (feeling of lack of accomplishment). In the past 35 years, burnout has been investigated by professionals in all kinds of occupations. First, jobs requiring many emotional demands and providing services to people, such as human services and health providers were studied (Maslach et al., 2001). Nurses and social carers were the groups most often studied in the initial phase, from the1970s. Several occupations that contain provider-recipient relationships were included in job burnout studies from the 1990s (e.g. teachers, clerical staff, and managers). Burnout was viewed as 'a consequence of the interaction of an individual with a working setting' and 'a form of job stress, with links to such concepts as job satisfaction, organizational commitment, and turnover' (Maslach, et al., 2001; p.401). One of the most broadly used assessments of burnout is the Maslach's Burnout Inventory (MBI) which is designed to evaluate the three dimensions of job burnout. The sequence of occurrence in the three dimensions of job burnout is controversial. However, reduced personal accomplishment seems to be more complex and occur later or combined with the other two aspects.

In the development of the study of the theoretical and empirical stages of burnout, researchers discriminate between burnout and depression. Burnout happens later in a career more than at the beginning, thus it should be correspondingly stable in people who keep doing the same jobs. Burnout is a job-related and situation-specific problem compared with general depression (Freudenberger, 1983; Warr, 1987, both cited in Maslach et al., 2001, p. 404). Moreover, individuals who have

higher scores on neuroticism (who are depression-prone) show a tendency to be vulnerable to burnout. Maslach's Burnout inventory-Human Services Survey (MBI-HSS) is used in testing burnout level with people who work in health care or the human services.

Job Burnout in Nurses

Job burnout has important outcomes of both individuals and organizations; therefore, investigations of the damaging outcomes of burnout have become increasingly important. Nurses are considered to be vulnerable to burnout because of the huge emotional demands and many stressful work conditions because their job requires close interaction with patients, families and other medical staff. It is work in a continuously physical and emotionally draining setting. These job characteristics can lead not only to a high incidence of job burnout, but also increasing turnover (Kushnir et al., 1997). Although nurses may receive many rewards; the rewards are accompanied by very stressful experiences (Bakker et al., 2000; Maslach et al., 2001). Buunk and Schaufeli (1993) indicated the stressors of nursing work such as uncertainty, imbalance of nurses' effort and patients' outcome, and lack of control; nurses' self-esteem and personality are related to the development of nurses' burnout. Research indicates that the time the nurses spend on their work, the strength of the patients' emotional demands and getting along with patients who have poor prognoses are positive signs of potential burnout (Bakker et al., 2000). These three factors are exactly the characteristics of cancer nursing.

Physical symptoms (Peter et al., 1998) and sickness absence (Peter and Siegrist, 1997) have been used to evaluate the extent of job burnout. Burnout can cause nurses' absenteeism, intention to leave their professional or actual turnover. Even if burnout does not always lead to genuine turnover, it can lead to decreasing productivity, effectiveness, job satisfaction, and commitment to the job or organization. Negative interpersonal relationship can have an impact on the people

who experience burnout and their colleagues due to the rising incidence of personal conflict and disrupted job tasks. Exhaustion is more predictive than the other two components of burnout in stress-related health outcomes (Maslach and Leiter, 1997).

Zapf et al. (2001) found that emotional factors in work such as displaying or suppressing emotions, and being empathic showed influence on job burnout over and above stressors. Cancer nurses need to face high frequency of the patients' death and dying, along with emotional demands from patients, family and colleagues. In addition, cancer nurses are required to deal with special emotional challenges and demands from patients such as the fear of cancer recurrence and the side effects of treatments. Another common difficulty in cancer care is watching patients suffering but being unable to help.

Job-person fit was used to formulate a theoretical framework of burnout by Maslach and Leiter (1997). Several job characteristics are considered highly predictive of job burnout. The quantity of job demands is particularly correlated to the exhaustion dimension in burnout. Quantitative job demands are associated with too much work within a limited time; role conflict and ambiguity; the severity of clients' problems, absence of resources at work; and a lack of social support. In the literature (Buunk and Schaufeli, 1993), social support is an important buffering factor between job burnout and stressors; the relationship between the two is stronger when the workers' social support is low. Other factors affecting the level of burnout consist of lack of feedback from the job, lack of information and control (e.g. little autonomy in decision-making). In addition, mismatch in control is affiliated with reduced personal accomplishment; and lack of reward is connected with feelings of being inefficient. There are three dimensions of mismatch in the organizational context. Community mismatch occurs when workers feel unable to make positive connection with other people in the work place; feelings of unfairness cause cynicism between workers and the workplace; and values mismatch between the individual and the organization results in conflict.

Burnout is so wide-reaching that organizations should strive to prevent or treat it. Individual strategies are ineffective in dealing with burnout, as less control over workplace stress and changes in the organization are extremely expensive and arduous. Organizational interventions require much complex collaboration and large amounts of investment of time and money (Leiter and Maslach, 2000). The limitations of effective design of research into organizational change in interventions or control groups, and difficulty in assessment interventions of longitudinal impact on work behaviour; both create gaps in the existing research. Personal behaviour in choosing coping strategies is partially related to individual's personality (the rest being related to resources available in the workplace); also, coping strategies are associated with treating burnout (Wu et al., 2007). Testing the relationship between personality traits, stress and burnout may offer new insights to tackling and preventing burnout in cancer nurses.

In research from three provincial hospitals in China (Wu et al., 2007), younger nurses reported higher burnout levels and nurses with lower educational status had lower levels of professional efficacy. Moreover, the exhaustion level among surgical nurses was significantly higher than among nurses for internal medicine and other specialities. Armstrong-Stassen et al. (1994) demonstrated that the level of burnout (especially emotional exhaustion) can predict the strength of nurses' future intentions to leave the career. In addition, in research by Parker and Kulik (1995), lack of work support and job stress were the best predictors of burnout.

The stressors and work environment of cancer nurses are somewhat different from those of general nurses. Selecting cancer nurses as the research sample can help to distinguish the characteristics of cancer nurses' burnout from those of other specialist nurses and have the opportunity to match the most appropriate strategies to deal with burnout in cancer caring. Maslach's Burnout Inventory – Human Service Survey (MBI-HSS), which is widely used in burnout surveys, was selected for measuring nurses' burnout in this study.

2.1.4 Theoretical Background and Relevant Literature of Job Satisfaction

Definition of Job Satisfaction

Occupational stress may diminish employees' satisfaction with their job (Carson et al., 1998). Hoppock was the first scholar to consider the concept of job satisfaction by considering job satisfaction as an employee's feelings satisfied with the work environment, including both with physical and psychiatric factors; job satisfaction was also seen as an objective response to the employees' work context (Hoppock, 1935). Locke (1976) addressed the model of facet satisfaction and proposed that job satisfaction can be tested within the 'range of affect'. Previous studies had applied various job satisfaction theories, such as need hierarchy theory, based on Maslow's (Maslow, 1954) theory of human motivation; Herzberg's two-factor theory (Herzberg et al., 1959); Adams' equity theory (Adams, 1963); and Vroom's valence expectancy theory (Vroom, 1964).

Job satisfaction has recently been defined as personal work experienced as emotional reactions, the feeling of satisfaction being determined by an individual's attitude, feeling, previous work-related experience, communication with others, and personal expectations of the job. Job satisfaction plays an important role in organizations and low may lead to the consequences of diminished well-being, bad harmony, incidence of turnover and absenteeism, complaints, early retirement, and delays in completing tasks (Vecchio, 1995). Fincham and Rhodes (2005, p.214) defined job satisfaction as the workers' 'feeling about their job rather than their thoughts about it'. Furthermore, the authors indicated that job satisfaction should be taken as an effective response rather than cognition; not only because this explanation better fits the context of human well-being, but also enables it to make more connection with other psychological research fields such as job stress.

Several questionnaires measure job satisfaction, such as the Brayfield-Rothe Job

Satisfaction Questionnaire for overall reaction to one's job (Brayfield and Rothe, 1951), the Job Descriptive Index (Smith et al., 1969), Michigan Organization Assessment Questionnaire (Cammann, 1983) and the Minnesota Satisfaction Questionnaire (Weiss et al., 1967). Among these measurements, the Minnesota Satisfaction Questionnaire is designed to study workers' satisfaction on several factors of 20 aspects of their job. Some of the job satisfaction measurements have been used to explore nurses' job satisfaction, for instance, the McCloskey/Mueller Satisfaction Scale (Tourangeau et al., 2006). Sometimes, a single question about overall satisfaction with the nursing job was included in previous research.

Content analysis and self-report questionnaires are two of the main research methods for exploring job satisfaction in nurses. Content analysis is mostly used to confirm or to interpret models, and self-report questionnaires are more commonly used to examine the level or the constituents of job satisfaction. Although various methods are used to investigate job satisfaction, the self-report anonymous questionnaire is the most commonly used survey approach; in this research method, the employees' attitudes and their satisfaction levels can be better explored. Several variables are consistently correlated with job satisfaction, such as job characteristics, autonomy, individual factors, payment and benefit, etc. (Fincham and Rhodes, 2005).

Job Satisfaction in Nursing

In a nursing career, job satisfaction is believed to be positively correlated with work performance, intention to stay, professional commitment, outcome and quality of patient care, whether directly or indirectly (Hinds et al., 1994; Aiken et al., 2002; Lin et al., 2007a). Aiken et al. (2001) stated that the level of nurses' job dissatisfaction could affect the organizational survival and development. The American Nursing Association (1995, cited in Tzeng, 2002) further identified that satisfaction of nurses with work and patients in a medical care system are the two most important indicators in evaluating nursing quality. Nurses' job satisfaction

may influence clinical outcomes such as the quality of care delivered to patients, patients' perceived satisfaction and the relationships between nurses and patients (Takase et al., 2001; Tzeng et al., 2001; Tzeng, 2002; Tzeng and Ketefian, 2002). Several factors are indicated to be related to nurses' dissatisfaction, such as excessive workload, inadequate staff manpower (or shortage of nurses), poor collaboration with other professionals, lack of time to spend on patients, bad leadership, clinical ethics dilemmas, negative affectivity, inadequate resources, high educational level, role ambiguity, level of autonomy and stress (Chu et al., 2003). In Kovner et al. (1994) pay, autonomy and professional status were the substantive predictors of job satisfaction. Lim and Yuen (1998) illustrated demands from patients and their relatives, requirements from physicians, and nurses' perceived job image were associated with the level of nurses' job satisfaction; additionally, these three variables were correlated with nurses' intentions to leave their jobs. Ma et al. (2003) collected surveys from 3,472 nurses in South Carolina and concluded that years of service, job position, hospital retirement plan, and geographic area influenced nurses' job satisfaction significantly. Adams and Bond (2000) indicated interpersonal relationships, workload, and appropriateness of system in the workplace as influential factors of nurses' job satisfaction; and routinization, instrumental communication and positive affectivity were the major determinant factors recognised by Agho et al. (1993).

In the field of occupational psychology, job satisfaction has been shown to have strong correlation with intention to leave or job turnover rate (Lum et al., 1998; Larrabee et al., 2003). Larrabee et al. (2003) also found diversified predictors of psychological empowerment and demonstrated their relationship to job satisfaction in nurses. Those predictors included hardiness, transformational leadership style, nurse/physician collaboration, and group cohesion. Irvine and Evans (1995) conclude that work contents and work environment are stronger variables affecting nursing job satisfaction than economic status or individual differences. In one UK study, the relationship between the nationalities of nurses, the work environment, their educational and, personal characteristics, and their

job satisfaction was confirmed (Ingersoll et al., 2002). An empirical test of the revised Price-Mueller model (Price and Mueller, 1986) which represents hospital nurses' job satisfaction was completed by Chu et al. (2003) in Taiwan. Eleven exogenous variables were tested to understand the correlation between each variable and job satisfaction with statistical methods. The questionnaire, constructed from measures used in the United States, was translated into Chinese. Three hundred and eight nurses completed the questionnaires: the results indicated that 'routinization' of work characteristics, 'positive affectivity' and 'job involvement' of personality traits have a significant impact on nurses' job satisfaction; on the other hand, pay is the only variable which is not significantly correlated with job satisfaction. Nurses who have higher job satisfaction are willing to give more effort to the job; maintain their enthusiasm over time; experience greater power of control, equal rights, freedom and potential promotion at work; and also perceive better support from supervisors, colleagues, relatives and friends. In addition, this research suggested that research to obtain information about nurses' personalities will help administrators to predict future job satisfaction of nursing staff and may be used as reference materials in personnel selection. The need for further investigation to explore the relationship between individual personality characteristics was echoed by Tzeng (2002) in an empirical investigation of the influence of nurses' working motivation and job satisfaction on intention to leave nursing in Taiwan.

However, De Jonge and Schaufeli (1998) stated that the characteristics of the job may be the predominant causal factor, rather than individual differences such as negative and positive affectivity, even other psychological domains; and Kangas et al. (1999) proposed that no differences are found of nurses' job satisfaction under various medical organizations or nursing care delivery models; and Adams and Bond (2000) indicated that personal characteristics were not related to nurses' job satisfaction. Personality traits are still good extraordinary reference resources when medical organizations recruit new nurses, because the traits are unique interpersonal characteristics related to predictions of future behaviour (Digman,

1990; Goldberg, 1993; Costa and McCrae, 1997). According to Holland (1997) Personality-Job Fit Theory, the congruence of individuals' personalities and psychological environment can affect the outcomes of job satisfaction; and nurses' job satisfaction is a powerful predictor of their intention to leave the profession; and psychological empowerment such as hardiness is a premier predictor of job satisfaction (Larrabee et al., 2003). The Nurse's job satisfaction scale (NJSS) was developed by integrating previous literature and developing questionnaires in Taiwan (Lin et al., 2007b), which reflected the cultural background of Taiwanese nurses and their work content. Therefore, NJSS was selected as the measurement of job satisfaction in this study. The components, scoring method, the results of validity and reliability were shown in the next chapter in the measurement section.

2.1.5 Theoretical Background and Relevant Literature of Resilience

The Definition of Resilience

Resilience has become an important variable when investigating stress over the past decade; it has been taken as an essential mediator in the process of facing stress events. The agreed definition of resilience by Smith et al. (2008) in the dictionary (Agnes, 2005) is: 'to bounce back or recover from stress' (Smith et al., 2008, p. 199), similarly, Smith et al. (2010) proposed another definition in Simpson's (2005) dictionary: 'to bounce or spring back' (Smith et al., 2010, p. 166). In other words, resilience is 'the ability to recover from stress or adversity' (Smith et al., 2008, p. 199).

There is no congruent definition or theory of resilience (Stewart and Yuen, 2011). It was argued that resilience is an enduring personality disposition (Fredrickson et al., 2003; Campbell-Sills et al., 2006), or it is constructed from adaptive coping strategies over time (Neenan, 2009). Resilience had been defined as an ability to 'withstand, regulate and cope with ongoing life challenge and succeeds in

maintaining equilibrium despite negative effects from stress' (Lian and Tam, 2014, p. 46), and it was also seen as a series of learned coping strategies to access available support, develop self-awareness and protect oneself (Hunter and Warren, 2014). Overall speaking, resilience involves a set of cognitive, behavioural and emotional responses to help the individual in minimizing the risk when going through adversity (Luthar et al., 2000). Questionnaires in investigating resilience vary according to the definition used in each study.

Several factors are correlated with resilience; for instance, personal characteristics (personality), good social relationships, being clear of feelings and mood, and having purpose in life (Smith et al., 2008; Smith et al., 2010). Previous literature defines some resilience resources, which are easily misunderstood, wrongly as resilience; for example, optimism, support from others, effective coping, etc. (Smith et al., 2008). Moreover, Smith et al. (2010) found that resilience is a good predictor of mental and physical health status.

Resilience has been defined specifically as a method of 'facilitating adaption in stressful environment' (Gillespie et al., 2009, p. 968), which means bouncing back successfully through coping in adverse circumstances (Hart et al., 2014). As nursing is considering rather stressful in daily work, resilience has become a critical 'trait' or 'ability' in nurses.

Resilience in Nursing

Resilience in nursing has been investigated in the health professions. Resilience makes nurses endure the difficulties in their work (Wei and Taormina, 2014), and helping nurses to build their resilience has been seen as a way of reducing stress and retaining manpower (Hart et al., 2014). Scholars in nursing have defined some attributes of resilience, including rebounding, carrying on, self-esteem, self-efficacy, self-determination, flexibility, sense of humour, positive social support, being

hopeful and coping (Dyer and McGuinness, 1996; Earvolino-Ramirez, 2007; Gillespie et al., 2007).

Few studies have been done on resilience in nursing. Some qualitative studies used phenomenology to explore the experience of resilience at work in hospice nurses (Ablett and Jones, 2007), acute care nurses (Hodges et al., 2008) and building resilience in burn nurses (Kornhaber and Wilson, 2011); ethnography was used to understand contributory factors to the need of resilience, the components of resilience and strategies to sustain resilience in nurses and midwives (Glass, 2009). The correlations between resilience and personal characteristics such as age, educational level, and years of experience were tested (Gillespie et al., 2009) in operation room nurses; while education was not significantly related with resilience, other two variables showed modest correlations. In a questionnaire survey study analysed in Pearson's correlation, psychiatric nurses with higher resilience reported a higher level of job satisfaction (Matos et al., 2010). A resilience model was tested by using a regression model: the result indicated that hope, self-efficacy, coping, workplace culture and age explained resilience significantly in operation room nurses (Gillespie et al., 2007). McDonald et al., (2012) claimed that a work-based educational intervention was able to promote nurses' resilience.

Through the literature, resilience should have significant relationships with aspects of personality and stress levels which are strongly related to job burnout and satisfaction. Therefore, the inclusion of cancer nurses' resilience is imperative in the present study. The brief resilience scale (BRS), which only contains 6 items and aims to measure resilience in its basic meaning with regard to negative events, was selected in this study (Smith et al., 2008). This scale was assessed for factor structure, reliability and validity. BRS it was also confirmed that the scale is correlated with numerous other measurements of personal characteristics social relationships, coping and health-related outcomes. More details of the BRS will be provided in the next chapter in the measurements section.

2.2 Systematic Literature Review of the Relationship between Personality, Job Stress, Burnout, Satisfaction and Resilience in Nurses

Systematic review was stated as 'concise summaries of the best available evidence that address a well-defined clinical question' (Mulrow et al., 1997, p.389, cited in Aveyard, 2010). A systematic review aims to answer a predefined question by searching relevant literature comprehensively. Then the reviewer has to follow up the developed inclusion/exclusion criteria strictly and appraise the selected papers using acknowledged critical criteria with the purpose of assuring that the most relevant papers with acceptable qualities are selected. In addition, abstracts were used to confirm the relevance of the papers (Aveyard, 2010). To address the gap in the present research associated to the research question: 'What is the relationship between personality traits and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses?', a systematic literature review was done and will be delineated in this section. Electronic online searching was applied, using databases including OVID-SP, CINAHL, PubMed, Cochrane and Google scholar. The aim and objectives of this systematic review are addressed below.

Aim:

Exploring the relationship between personality, stress, burnout, job satisfaction and resilience in nurses.

Objectives:

*Exploring the significant correlation between personality and stress in nurses;

* Exploring the significant correlation between personality and burnout in nurses;

*Exploring the significant correlation between personality and job satisfaction in nurses;

* Exploring the significant correlation between personality and resilience in

nurses.

Systematic review strategies were applied and the steps of the PRISMA flow diagram (Moher et al., 2009) were used to identify and screen the literature. The items used for searching are listed as follows.

Searched Items:

Nurses * (nurse, nurses, nursing)

And

Personality or 'personality traits' or 'disposition'

And

Stress or 'stressor' or 'stressors' or 'job stress' or 'work stress'

And

Burnout or 'job burnout'

And

Job satisfaction or 'work satisfaction'

And

Resilience or 'resilient'

Inclusion criteria developed for this review were:

1) quantitative research;

2) participants who were clinical nurses;

3) studies with outcomes representing the relationships between personality and stress, burnout, job satisfaction and resilience;

4) English langue only;

5) Published literature only.

Exclusion criteria were:

1) qualitative research;

2) participants who are head nurses, administrators and nursing practitioners;

3) studies which simply explored nurses' personality traits, stress, burnout, job satisfaction and resilience levels without indicating the relationship between personality and the rest four variables;

4) not English language literature;

5) unpublished literature.

Questionnaire surveys have become the main methods in personality investigation, using behavioural measurement under scientific theories; and measuring personality scales allowing researchers to compare personality traits among individuals (Matthews et al., 2009). The purpose of this systematic review is to explore the relationships between personality and other variables; selecting quantitative studies helps the reviewer to focus on papers which test the relationships between personality and other variables. The reason for excluding participants who are not working as clinical nurses is because the work contents and stressors are quite different for front line clinical nurses from those of head nurses, administrators or nursing practitioners. The relationships between nurses' stress and job satisfaction or burnout and job satisfaction were investigated in depth. This research aimed to understand how nurses' personalities influence

stress, burnout, job satisfaction and resilience; therefore, research without revealing the relationship between personality and the other variables was discarded. Selecting published papers allowed the reviewer to evaluate the quality of research. The years of publication was not limited, because the reviewer desired to include the maximum amount of relevant literature.

Aveyard (2010) indicated that there is a lack of critical appraisal tool in cross-sectional questionnaire surveys when doing a literature review. However, the texts of literature should contain through information about the research question, the construction of questionnaires and the research designs have to meet the principles of questionnaire survey design. For example, they should clarify whether the questionnaire was designed poorly, or whether the data were collected from representative population?' etc. The reviewer must be familiar with questionnaire design and survey. Seven principles cited in Aveyard's (2010, page 103) book about how should we critique quantitative studies was used to appraise the selected papers. Afterward, the research designs, statistical methods and the selected questionnaires were reviewed; and the outcomes to measurements and results of significant relationships were sought. The correlations between nurses' personality traits and 1) stress; 2) burnout; 3) job satisfaction and 4) resilience were summarised and compared.

2.2.1 Review Results

The numbers of studies found in each database except Google Scholar® are reported as follows inside brackets: OVID-SP (82); CINAHL (152); PubMed (89); Cochrane (0). Then the records were screened, duplicates in databases meanwhile being removed. Eleven studies remained finally (please refer to Table 2: summary of systematic literature review results). All literature was appraised using the quantitative study appraisal principles in Aveyard (2010). Most of the literature conformed with the appraisal principles; only the sample size in the study by Burgess et al. (2010) was small and the statistical power value was not reported in

this research paper. However, in view of the small number of related literature items found, all 11 literatures were included. The searching process and results are shown in Figure 4.

Table 2. Summary of Systematic Literature Review Results

Study	Design	Questionnaires	Participants	Statistical tests	Outcome measure	Results	Appraisal
Hudek-Kenzevic, Maglica and Krapic (2011)	Cross-sectional questionnaire survey at two point: first entry to the wards and four years later	1) Big Five Inventory 2) Perceived Organizational Stress Inventory 3) Organizational Commitment Questionnaire 4) Maslach Burnout Inventory	118 hospital nurses	1) Pearson's correlations 2) Hierarchical regression	The relationship between 1) personality and stress 2) personality and sburnout	1) Agreeableness was the only negtive predictor to all 3 dimensions of burnout 3) Neuroticism and Conscientiousness and organizational stress moderated burnout 4) Agreeableness and Openness were negtively related to reduced professional efficacy in burnout	Meet all the quantitative study appraisal principles (Aveyard, 2010)
Meeusen, Van Dam, Brown-Mahoney, Van Zundert and Knape (2011)	On-line self-report cross-sectional questionnaire survey (the questionnaire open for completion for 3 months)	1) Turnover intention 2) Maslach Burnout Inventory 3)Satisfaction with the job, organization and department atmosphere 4) ToetsingslijstMens and Organisatie (TOMO, work context) 5) Work climate 12-item scale 6) Myers-Briggs Type Indicator	923 Dutch nurse anesthetists (Dutch hospital and private clinics)	Structural equation analysis	1) How the work context characteristics, work climate and personality dimensions influence burnout and job satisfaction 2) The intention to turnover	1) Personality was related to burnout, except orderly in personality 2) Personality was not significantly related to job satisfaction, only “easy going” had correlation with job satisfaction 3) Burnout and job satisfaction showed significant relationship to intention to leave	Meet all the quantitative study appraisal principles (Aveyard, 2010)

Table 2. Summary of Systematic Literature Review Results

Study	Design	Questionnaires	Participants	Statistical tests	Outcome measure	Results	Appraisal
Burgess, Irvine and Wallymahmed (2010)	Cross-sectional questionnaire survey	1) NEO personality inventory 2) Nurses stress scale 3) Brief Coping Orientations to Problems Experienced	Convenient sample of critical care nurses (n=46) in the UK	t-test, Spearman's Rho(r_s)	The correlation between personality traits, perception of workplace stress and coping	Personality traits did not show statistically significant correlation with workplace stress in ICU nurses; however, certain personality traits might have a buffering effect on stress	The sample size was small and the statistic power value was not reported
Chang, Li, Wu and Wang (2010)	Cross-sectional questionnaire survey	1) Rosenberg Self-Esteem Scale 2) Proactive Coping Scale 3) Job Satisfaction of Nurses 4) Life Orientation Test-Revised 5) Center for Epidemiologic Studies Depression Scale 6) Chinese General Self-efficacy Scale	314 nurses in two reginal hospitals in Taiwan	1) Pearson product-moment correlation 2) Multiple regression	The relationship between personality and job satisfaction	Personality traits (optimism, self-esteem, proactive personality, self-efficacy, negtive affectivity) were significantly contributed to job satisfaction	Meet all the quantitative study appraisal principles (Aveyard, 2010)

Table 2. Summary of Systematic Literature Review Results

Study	Design	Questionnaires	Participants	Statistical tests	Outcome measure	Results	Appraisal
Meeusen, Brown-Mahoney, Dam, Zundert and Knape (2010)	On-line self-report cross-sectional questionnaire survey (the questionnaire open for filling for 3 months)	1) Satisfaction with the job, organization and department atmosphere 2) Myers-Briggs Type Indicator	923 Dutch nurse anesthetists (Dutch hospital and private clinicals)	1) Dimension analysis 2) Principal components analysis with Oblimin rotation	1) The most frequently seen personality traits 2) The job satisfaction level 3) The correlation between personality traits and job satisfaction	Easy going and orderly were correlated to job satisfaction significantly and positively, and easy going was the best predictor in job satisfaction	Meet all the quantitative study appraisal principles (Aveyard, 2010)
Garrosa, Rainho, Moreno-Jimenez and Monteiro (2010)	Two time-point, cross-sectional survey	Nursing Burnout Scale: 1)Antecedents 2)Burnout 3)Hardy personality 4)Coping	Convenient sample of 98 nurses in Portugal	1) Descriptive statistics 2) Pearson's correlations 3) Hierarchical linear regression	The temporal and cross-sectional relationships between job stressors, hardy personality and burnout dimensions among nurses	1) Control was negatively related to emotional exhaustion and depersonalization 2) Control and challenge were effective predictors of lack of personal accomplishment	Meet all the quantitative study appraisal principles (Aveyard, 2010)

Table 2. Summary of Systematic Literature Review Results

Study	Design	Questionnaires	Participants	Statistical tests	Outcome measure	Results	Appraisal
Garrosa, Moreno-Jimenez, Liang and Gonzalez (2008)	Cross-sectional questionnaire survey	Nursing Burnout Scale: 1) Burnout 2) Hardy personality 3) Stressors	473 nurses and student nurses from three general hospitals in Spain	1) Descriptive statistics 2) Pearson's correlations 3) Hierarchical multiple regression	The roles of socio-demographic variables, job stressors and hardy personality in processing burnout	Hardy personality had significant negative relationship with burnout; specifically, control in the hardy personality dimension was highly related with lack of personal accomplishment.	Meet all the quantitative study appraisal principles (Aveyard, 2010)
Gillespie, Chaboyer, Wallis and Grimbeek (2007)	Cross-sectional questionnaire survey	1) Perceived Competence Scale 2) Collaboration with Medical Staff 3) Cohesion Among Nurses 4)Peer support Scale 5) Managing Stressful Situation Scale 6) General Self-efficacy Scale 7) Adult Disposition Hope Scale 8) Planful Problem-Solving Scale 9) Connor-Davidson Scale	722 operating room nurses across Australia	1) Pearson's correlations 2) multiple regression analytic model (parsimonious model)	How much variance of resilience is explained by the parsimonious model	The parsimonious model was constructed from hope, self-efficacy, control, coping and competence. The model was able to explain 60% of variance of nurses' resilience. (Coping is not a personality trait)	Meet all the quantitative study appraisal principles (Aveyard, 2010)

Table 2. Summary of Systematic Literature Review Results

Study	Design	Questionnaires	Participants	Statistical tests	Outcome measure	Results	Appraisal
Buhler and Land (2003)	Cross-sectional questionnaire survey with randomised sample	1) Maslach Burnout Inventory 2) Eysenck Personality Inventory 3) Inventory of Aggressivity 4) Scales of Control 5) Trier Personality Questionnary 6) Locus of Control 7) LOGO tesy (for existential frustration)	119 nursing staffs in intensive care unit in Germany	Stepwise multiple regression	The relationship between personality and burnout	1) Neuroticism was positively related with emotional exhaustion and depersonalization 2) Extraversion was positively related with all 3 dimentions of burnout	Meet all the quantitative study appraisal principles (Aveyard, 2010)
Zellars, Perrewe and Hochwarter (2000)	Cross-sectional questionnaire survey by mail	1) Role stressors (role conflict, role ambiguity, quantitative role overload) 2) NEO Five-Factor Inventory 3) Maslach Burnout Inventory	188 nurses in the southeastern United States	Multiple regression	The relationship between 1) three role stressors and burnout 2) five-factor personality traits and three dimensions of burnout separately.	1) Neuroticism significantly predicted emotional exhaustion 2) Extraversion and agreeableness were negatively relative to depersonalization, but openness was oppsite 3) Extrovert and openness were negatively correlated with diminished personal accomplishment	Meet all the quantitative study appraisal principles (Aveyard, 2010)

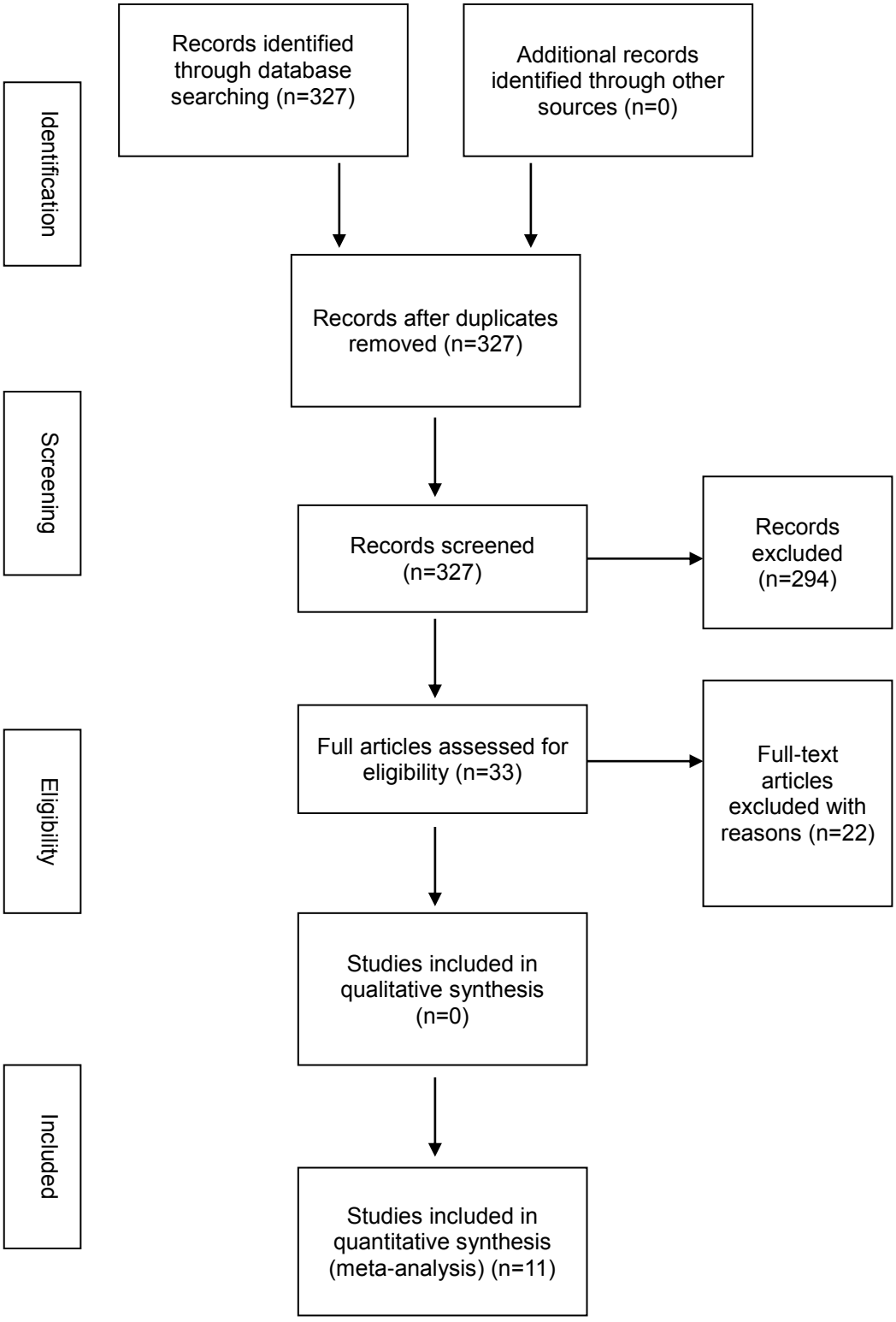
Table 2. Summary of Systematic Literature Review Results

Study	Design	Questionnaires	Participants	Statistical tests	Outcome measure	Results	Appraisal
Eastburg, Williamson, Gorsuch and Ridley (1994)	Intervention research, two time point, the second time point was 30 days after phase I survey	1) Work environment scale 2) PROSCAN 3) Scale H of the 16PF 4) Maslach Burnout Inventory	1) Phase I: 76 nurses 2) Phase II: 62 nurses (treatment group:34; control group:28) in the United State	ANOVA	1)The relationship between personality traits and burnout 2) The interaction of social support and extraversion in relation to burnout	1) Strong negative correlation between work related social support and burnout 2) Partial dimensions of personality explained a significant amount of burnout 3) extraversion nurses need more work-related peer support	Meet all the quantitative study appraisal principles (Aveyard, 2010)

PROSCAN: Professional Dynametric Programme System Inventory

16 PF: Sixteen Personality Factor Questionnaire

Figure 4. Systematic Review Strategies with the Steps of the PRISMA Flow Diagram



The participants included nurse anaesthetists (Meeusen et al., 2010; Meeusen et al., 2011), critical care nurses/intensive care unit nurses (Buhler and Land, 2003; Burgess et al., 2010), nurses and student nurses (Garrosa et al., 2008), operating room nurses (Gillespie et al., 2007) and general nurses(Eastburg et al., 1994; Zellars et al., 2000; Gillespie et al., 2007; Chang et al., 2010; Garrosa et al., 2010; Hudek-Knezevic et al., 2011). The sample sizes ranged from 46 to 923 subjects. The studies were conducted in eight countries: Australia (Gillespie et al., 2007), the Netherlands (Meeusen et al., 2010; Hudek-Knezevic et al., 2011; Meeusen et al., 2011), the United Kingdom (Burgess et al., 2010), Portugal (Garrosa et al., 2010), Spain (Garrosa et al., 2008), Germany (Buhler and Land, 2003), Taiwan (Chang et al., 2010) and the United States of America (Eastburg et al., 1994; Zellars et al., 2000). All the studies were defined as cross-sectional surveys using questionnaires, and three of them were tested at two time points (Eastburg et al., 1994; Garrosa et al., 2010; Hudek-Knezevic et al., 2011). One study had an intervention asking the supervisors to provide positive feedback to treatment groups in the second phase of the study (Eastburg et al., 1994); while one study did not didicate the method of questionnaire dispatch (Buhler and Land, 2003). Questionnaires were dispatched by on-line systems (Meeusen et al., 2010; Meeusen et al., 2011), mail (Zellars et al., 2000; Gillespie et al., 2007); in a post-work course (Garrosa et al., 2010); or from the nursing directors (Garrosa et al., 2008; Chang et al., 2010); sent back from the internal mail system (Burgess et al., 2010); and colleted by well prepared psychology students (Hudek-Knezevic et al., 2011). Three of the 11 studies aimed to explore the relation between personality and job satisfaction (Buhler and Land, 2003; Meeusen et al., 2010; Meeusen et al., 2011), and seven studies claimed the correlation of personality and burnout (Eastburg et al., 1994; Garrosa et al., 2008; Chang et al., 2010; Garrosa et al., 2010; Meeusen et al., 2010; Hudek-Knezevic et al., 2011). One study developed a model to examine the relation between resilience and perceived competence, collaboration, control, self-efficacy, hope and coping (Gillespie et al., 2007). The other study focused on the relationship between personality and stress, although the results indicated that there was no significant correlation of these two variables (Burgess et al., 2010).

The selected questionnaires by authors were divided into five parts: personality, job satisfaction, stress, burnout and resilience. Some studies which did not define the questionnaires they had used were excluded. First, in the personality part, researchers chose: Myers-Briggs Type Indicator (MBTI)(Meeusen et al., 2010; Meeusen et al., 2011); the Revised NEO Personality Inventory (NEO-PI-R) (Burgess et al., 2010); Hardy Personality(Garrosa et al., 2008; Garrosa et al., 2010); NEO Five-Factor Inventory (NEO-FFI) (Zellars et al., 2000); Big Five Inventory (Hudek-Knezevic et al., 2011); Professional Dynametric Programme System Inventory and Scale H of the sixteen personality factor questionnaire (16PF) (Eastburg et al., 1994); Perceived Competence Scale, the Managing Stressful Situation scale (to measure control), the General Self-Efficacy scale, the Adult Dispositional Hope Scale (Gillespie et al., 2007); the Rosenberg Self-Esteem Scale, the Proactive Coping Scale, Life-Orientation Test-Revised (to measure optimism), Center for Epidemiologic Studies Depression Scale (to measure negative affectivity), Chinese General Self-efficacy Acale (Chang et al., 2010); Eysenck Personality Inventory, Inventory of Aggressivity; Scale of Control; Trier Personality Questionnary; Locus of Control (Buhler and Land, 2003). Second, the Nurses Stress Index was applied (Burgess et al., 2010). Third, three studies used Maslach's Burnout inventory (MBI) (Eastburg et al., 1994; Zellars et al., 2000; Buhler and Land, 2003; Hudek-Knezevic et al., 2011; Meeusen et al., 2011) and two studies employed Nursing Burnout Scale to test burnout level (Garrosa et al., 2008; Garrosa et al., 2010). Finally, the Connor-Davidson Resilience Scale was used to measure resilience (Gillespie et al., 2007).

Various statistical methods were conducted to test the correlations, including structural equation analysis (Meeusen et al., 2011), Spearman's Rho (Burgess et al., 2010), Pearson correlations (Gillespie et al., 2007; Garrosa et al., 2008; Chang et al., 2010; Garrosa et al., 2010; Hudek-Knezevic et al., 2011), hierarchical linear regression (Gillespie et al., 2007; Garrosa et al., 2008; Garrosa et al., 2010; Hudek-Knezevic et al., 2011), multiple regression (Zellars et al., 2000; Chang et al., 2010), multiple regression analytic model with building a parsimonious model (Gillespie et al., 2007), stepwise multiple regression (Buhler and Land, 2003), dimension analysis, principal components analysis with Oblimin rotation (Meeusen et al., 2010) and ANOVA (Eastburg et al., 1994).

The Correlation between Personality and Stress

Notwithstanding the finding that personality traits were not statistically significantly correlated with workplace stress in nurses who worked in intensive care units, several traits were associated with less stress perceived by nurses due to the influence of personality which affected the kind of coping strategies they would pick. Nurses who were more open and extravert had less perception of stress in 'deal[ing] with difficult patients and relatives' (p.135). In addition, conscientiousness was negatively correlated with the stressors of 'lack of confidence and competence' and 'workload stress' such as time pressure and management stressors (Burgess et al., 2010).

The Correlation between Personality and Burnout

In Meeusen et al.'s study (2010), 'easy going', 'compassionate' and 'receptive' among personality dimensions were negatively related to burnout. Two studies which used the hardy personality as the measurement tool conclude that the hardy personality was significantly correlated with burnout. 'Control' in the hardy personality was highly related with 'lack of personal accomplishment' (Garrosa et al., 2008; Garrosa et al., 2010), and negatively correlated with 'exhaustion' and 'depersonalization' (Garrosa et al., 2010). Moreover, 'challenge' was recognised as an effective predictor of 'lack of personal accomplishment' (Garrosa et al., 2008). In the study completed with the NEO Five-Factor Inventory in the south-eastern United States, five dimensions of personality predicted three dimensions of burnout separately. 'Neuroticism' was a significant predictor of 'emotional exhaustion'. 'Extraversion' and 'agreeableness' were negatively relative to 'depersonalization', but with 'openness' it was the reverse. 'Extraversion' and 'openness' were negatively correlated with 'diminished personal accomplishment' (Zellars et al., 2000). Similar research results were found in Buhler and Land's study (2003): neuroticism was positively related emotional exhaustion and depersonalization, and extraversion was positively related to all three dimensions in burnout. In addition, Hudek-Knezevic et al. (2011) indicated that agreeableness

was able to predict all of the three dimensions of burnout in negative correlation, and openness was negatively related to reduce professional efficacy. The only intervention study in this review argued that personality only partially explained a specific amount of burnout (Eastburg et al., 1994). To summarise, a significant correlation between personality and burnout indeed exists.

The Correlation between Personality and Job Satisfaction

In a study with an on-line self-reporting questionnaire survey (Meeusen et al., 2010), the personality dimensions of 'easy going' and 'orderly' were correlated to job satisfaction significantly and positively. These two traits explained 3.5% of the variance between personality and job satisfaction. The personality dimension 'easy going' in the MBTI which is comparable to 'Extraversion' in the Big Five theory is the best predictor of job satisfaction in nurse anaesthetists (Meeusen et al., 2010). The other study (Meeusen et al., 2011) with the same participants (Dutch nurse anaesthetists) indicated that only 'easy going' in four personality dimensions of the MBTI had significant correlation with job satisfaction. In Taiwanese nurses, personality traits such as optimism, self-esteem, proactive personality, self-efficacy and negative affectivity significantly influenced job satisfaction (Chang et al., 2010).

The Correlation between Personality and Resilience

Gillespie et al. (2007) examined the relationship between personality and resilience by developing and testing a theoretical model of resilience in operating room nurses. The factors contributing to the resilience model were selected from a literature review; and the final parsimonious model consisted of significant variables including hope, self-efficacy, control coping and competency. 'Hope' in nurses means to be orientated toward future goals and believe they could reach the goal; the standardised β coefficient was 0.344 and the Pearson's correlation coefficient (r) was 0.67 in relation to resilience. Self-efficacy is defined as being confident in one's ability to deal tasks in specific circumstance; its β was 0.264,

r=0.63 in relation to resilience. Control could be referred to the individual's ability to recognise priority actions under a dynamic and fickle environment; its β was 0.159, *r*=0.53 in relation to resilience. Coping is a behaviour whereby the individual recognises stressors and makes efforts to adapt the stressful event; its β was 0.176, *r*=0.47 in relation to resilience. Competence represents how nurses think their ability to meet their work demands; its β was 0.176, *r*=0.38 in relation to resilience. Except coping, the concepts and definition of hope, self-efficacy, control and competence fit into the conscientiousness dimension in the Big Five personality.

2.2.2 Discussion of Systematic Review

Personality traits have been shown to be correlated with job satisfaction although the strengths of the relationship very between studies (Chang et al., 2010; Meeusen et al., 2010; Meeusen et al., 2011). Two personality traits of the Big Five are confirmed as associated with job satisfaction: conscientiousness and extraversion (Judge et al., 2000c; McManus et al., 2004).

Personality traits can affect the process of burnout; the traits may play a role as important factors which protect nurses from burnout (Garrosa et al., 2010). When nurses deal with their stress or are in the process of burnout, they may use some coping strategies to overcome the personal crisis. Problem-solving focused strategies are recognised as a more effective method, although emotionally focused strategies also help nurses in dealing with stressors. Nurses with various personality characteristics are different in choosing diverse types of coping. If nurses with certain personality types favour using problem-focused coping strategies, then they could have less job burnout (Garrosa et al., 2010). 'Control' and 'challenge' in the hardy personality of nurses lessen the occurrence of burnout. The research concluded that 'control' was negatively related to emotional exhaustion and depersonalization, whereas 'control' and 'challenge' were effective predictors of lack of personal accomplishment which was reflected in Payne's investigation (2001). The reason why control in the hardy personality influenced the individual to select different coping strategies to solve workplace problems is

that the individual tends to find out more information about the event and to express his/her feelings (Larrabee et al., 2003; Garrosa et al., 2010). On the contrary, Burgess et al. (2010) indicated there is no significant correlation between personality and stress, but openness and extraversion may be the buffering factors of nurses' perception of job stress.

Although the study of Gillespie et al. (2007), which focused on building a model to explain resilience in operating room nurses, did not include personality as a variable; due to the dearth of relevant literature and the definitions of hope, self-efficacy, control and competence it closely fits the conscientiousness facets in the NEO-PI-3 (McCrae and Coast, 2010), therefore, this was included. The model which constructed of hope, self-efficacy, control, coping and competence is able to explain 60% of variance of nurses' resilience (Gillespie et al., 2007). In conclusion, personality or individual's disposition are strongly correlated with resilience.

2.2.3 Assessment of Systematic Review

Stress strongly influences nurses' intentions to leave the profession in a direct way (Zeytinoglu et al., 2006); also levels of job satisfaction and burnout are powerful predictors of turnover (Griffeth et al., 2000). Meeusen et al. (2010) and Meeusen et al. (2011) clearly pointed out that hospitals can minimise or prevent nurse turnover by recruiting employees with specific personality traits. Selecting nurses with ideal personality traits is a more practical and cost-effective method of recruitment strategies in nursing administration. Although the work climate or organizational culture of the hospital can influence the employees' job satisfaction, stress and burnout, it is unavoidable that the specialist characteristics should be considered in future investigation of nurses' retention because different kinds of medical specialties (like cancer or theatre) could require different nurses with certain personality traits which strongly influence how nurses react to their work environment. Reducing nurse turnover and maintaining adequate staff requires creating a positive work environment with good work climate and reasonable work content. Also, nurses' resilience help them to enhance adaption when encountering

stress (Gillespie et al., 2007). A novel intervention will be selecting nurses by pre-employment assessment of personality traits (Burgess et al., 2010; Meeusen et al., 2010; Meeusen et al., 2011).

2.2.4 Relevant Research in Taiwan

Only one relevant literature was found after searching and reviewing studies done in Taiwan (Chang et al., 2010). There are three studies associated with nurses' personality; one focusing on the influence of personality on care quality (Teng et al., 2007); one investigating the influence of personality on nurses' job satisfaction (Chang et al., 2010); and one study of nurse supervisors carried out on the impact of their agreeableness and negative mood on their intentions to help colleagues (Chang et al., 2012). Investigations related to Taiwanese nurses' stress have been carried out by Tsai (1993), Tsai and Chen (1996) and Chu et al. (2006). Tsai (1993) compared the difference of stressors between nurses in Taiwan and those in western culture, Tsai and Chen (1996) developed a Chinese version of the Nurse Stress Checklist (NSC), and Chu et al. (2006) examined the impact of social support on job stress. The relationship between professional commitment, job satisfaction and work stress is tested in Lu et al. (2007) study, in addition, the relationship between role stress and job satisfaction was tested by Chen et al. (2007). Teng et al. (2010) explored the effects of nurses' burnout on patient safety. In conclusion, there is only one directly relevant study on all the variables considered in the proposed study in Taiwan.

2.3 Hypotheses

From the conceptual framework in Chapter 1 Figure 1, and the comprehensive literature review above, the following hypotheses were formed:

1) Personality factors are significantly related to stress;
2) Personality factors are significantly related to burnout;
3) Personality factors are significantly related to job satisfaction;

4) Personality factors are significantly related to resilience;
5) Stress, burnout, job satisfaction and resilience are significantly related to each other.

NB: At the outset, the specific dimensions of personality that may be related to stress, burnout, job satisfaction and resilience were not known, and the specific aspects of personality were not specified in the beginning of this project. For example, the following could have been hypothesised from the literature review:

1) Neuroticism is positively and significantly related to emotional exhaustion;
2) Neuroticism is positively and significantly related to depersonalization;
3) Neuroticism is negatively and significantly related to personal accomplishment.

However, personality was assumed to be the exogenous variable in the testing models, and resilience to be the prior endogenous variable; the positions of the other three variables in the models were changeable.

2.4 Summary

The relevant literature on theories and research related to personality traits, job stress, burnout, satisfaction and resilience has been reviewed and synthesised. Personality traits are confirmed as having correlations with job stress, burnout, satisfaction and resilience. There is neither research focused on exploring the strength of the relationships among those five variables; nor research specifically focused on cancer nurses. Throughout the literature review, the research gaps of previous studies are seen, the justification of research question can be confirmed and the hypotheses are formed.

Chapter 3 Methodology

3.1 Introduction

The aim of this research is to explore the relationship between cancer nurses' personality and their stress, burnout, job satisfaction and resilience. To test the significance of the relationship stated above, a questionnaire survey was used to measure nurses' personality, stress, burnout, job satisfaction and resilience. T-test, ANOVA (Analysis of Variance) and structural equation modelling (SEM) were used to test the relationship between variables. Subsequently, an interview survey was used to confirm the validity of the questionnaires and to investigate if the significant findings in the quantitative data could be reflected by interview data. This research is a cross-sectional explanatory sequential design of mixed method research. This chapter outlines the research methods including selecting methods, choosing investigating instruments, translating the Chinese version of the Brief Resilience Scale (BRS), ethical considerations, sampling method, sample size estimation, procedure for data collection, process of pilot study and data analysis.

In recent published papers, nurses' personality traits, resilience, stress, burnout and job satisfaction level were investigated in pairs or triplets: no research focused on examining the relationships among those variables as a whole; in addition, nurse samples in recent research tend to be narrowed to specific specialist areas because of the particularity of each nursing specialist context. Cancer nurses were the focus of this research, because of the high stress level, burnout and turnover rate in this group (Grunfeld et al., 2000; Barrett and Yates, 2002; Sherman et al., 2006).

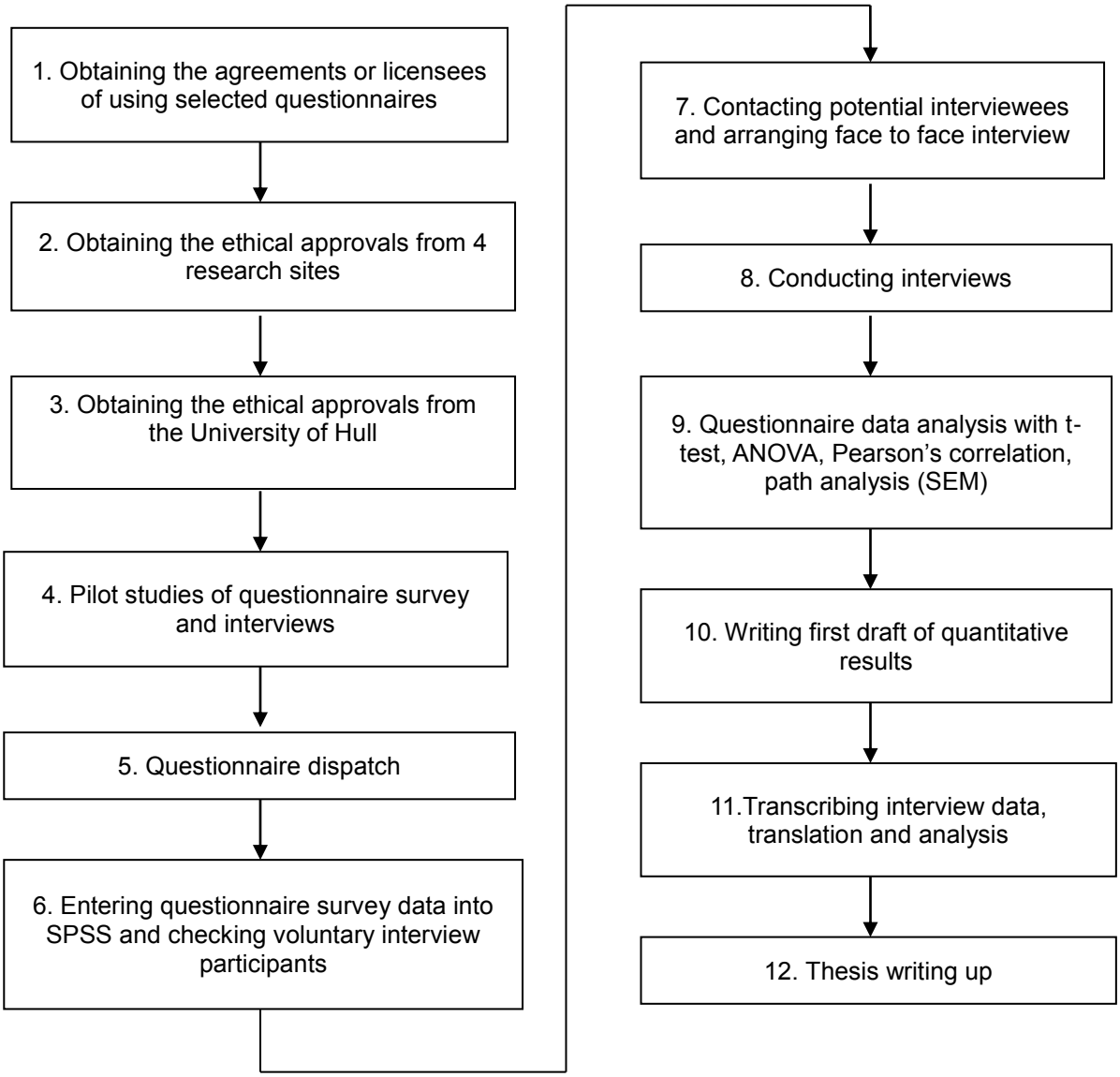
Quantitative data allows a researcher to test the correlation between variables by using statistical methods. The benefits of using questionnaires to measure psychological characteristics is unbiased information, allowing researcher to collect data from a large number of people in a more cost-efficient and speedier

way; the data collected is numeral and can be analysed in statistics. In other words, the survey data can be interpreted objectively and more easily (Jackson and Furnham, 2000; Polit and Beck, 2006). In addition, for both researchers and respondents, it is convenient and the questionnaires can be returned anonymously (Jackson and Furnham, 2000). Details of each questionnaire's components and reliability are given in the following section.

Moreover, a qualitative research method, face-to-face, one-to-one interview was used for the purposes of obtaining in-depth data; those in-depth data can be used to reflect and support the findings of the relationships among variables in the questionnaire survey and enhance the interpretation of the quantitative results. In the next section, the quantitative strand will be described, followed by the qualitative strand.

This research applied mix method in the explanatory sequential design; the flowchart of the procedure in implementing this research is shown in Figure 5.

Figure 5. Flow Chart of Research Steps



The importance issue of retaining nurses has been recognised for decades, and so studies related to nurses' personality, resilience, stress, burnout, and satisfaction are innumerable. Although the significance of the correlation between these valuable predictors of intention to leave the profession is confirmed, yet previous literature did not indicate how these variables interact with each other. The current Thesis has been conducted with mixed research methods in order that the quantitative significant results of the relationship can be assessed, enhanced or explained by the findings from the interviews with nurses (Creswell et al., 2003; Creswell and Plano Clark, 2011).

3.2 Ethical Issues

This research is a cross-sectional mixed method design; data collection took place between 13 May 2013 and 31 Oct 2013 including obtaining ethical approval from the hospitals. Four research sites were included: Koo Foundation Sun Yat-sen Cancer Center (KFSYCC), a regional hospital only for cancer treatments; the other three were medical centres, in including China Medical University Hospital (CMUH), Taiwan National University Hospital (TNUH) and Taipei Veteran General Hospital (TVGH), containing in all 15 cancer specialist wards. This research proposal was seen and approved by the Institutional Research Board (IRB) of the KFSSCC and the Research Ethics Committees in CNUH, NTUH and TVGH. After obtaining ethical approval from the hospitals, approval letters were e-mailed to the Departmental Research Ethics Committee of Faculty of Health and Social Science in the University of Hull for approval to start data collection (Please refer to Appendix 1). Also, the licenses for NEO-FFI and MBI-HSS were obtained as well as permission to use the traditional Chinese versions NSC and NJSS (Please see Appendix 2).

All participants were assured that their participation in this study was entirely voluntary, and that the data collection would be anonymous and confidential. The participants were guaranteed that the data would be used for academic research purposes only. The data were stored in a safe place in a locked box (hard copy questionnaires) and in a secure hard disc (statistical data) with encryption for 5

years after completion of the thesis.

According to the Good Clinical Practice (GCP) guideline which applies nationwide in Taiwan for clinical trials or other research, the information sheet included the names and institutions of the researchers, the purpose of this research, the prospective timetable, the summary of research content, the participants' rights, anonymity and confidentiality and the contact details of the primary researcher. The questionnaires were issued with self-adhesive envelopes to assure that the answers were invisible to casual observers. In addition, the participants' signatures indicating their informed consent were not required for the questionnaire survey, because the names of participants were not displayed on the questionnaires, and the participants had full autonomy to decide whether they are willing to answer the questionnaires or not. By completing the questionnaires and returning them in the envelopes, the participants agreed to take part in this research and gave the authority to researchers to use their data. In the case of face-to-face interviews, informed consent is needed. Before starting the interviews, the purpose of this research was explained along with the process of the interview; they were also informed that their participation was fully confidential and their data would be viewed only by qualified and relevant professional investigators who are approved by the IRB or ethic committees, their rights such as refusing to answer any question or withdraw from the research without any explanation. All necessary information was given to achieve informed consent, and the participants were encouraged to ask questions before they signed the informed consent sheets. The participants are able to make complaints by using the contact details of the primary investigator of hospitals or supervisors in the University of Hull.

3.3 Quantitative Strand

3.3.1 Introduction

When researchers construct a study, research methods indicate the techniques that

can allow them to collect relevant data and analyse it for the purpose of answering the research questions (Polit and Beck, 2006). Quantitative research methods are based on the positivist paradigm, which is driven by real causes or natural phenomena in real world. Quantitative methods seek generalizations; focus on obtaining objective, measureable and quantifiable information; and can usually be referred to statistical analysis. In the psychological field, psychologists strive to develop valid questionnaires to measure human's thoughts, behaviour and characteristics.

3.3.2 Selected Questionnaire Survey Measurement Tools

A successful study is based on appropriate research design; in the design, valid research instrument is a key factor (Jackson and Furnham, 2000). In this section, the questionnaires used in this research will be introduced. The measurements selected include: NEO-FFI-3 (Coast and McCare, 2006) for personality; NSC (Benoliel, 1990; translated into Chinese by Tsai, 1993) for stress level; MBI-HHS (Maslach et al., 2001) for burnout; NJSS (Lin et al., 2007b) for job satisfaction; and BRS (Smith et al., 2008) for resilience. In addition, a self-developed demographic questionnaire was applied in the first part of the questionnaire survey.

The effectiveness of a measurement depends on its reliability and validity; the higher reliability and validity, the better the measurement. Reliability and validity are also extremely important in developing personality trait measurement because psychometric professionals strive to measure human feelings, responses or emotional states that are intangible and hard to gauge. Other instruments for measuring stress or job satisfaction must also possess acceptable reliability and validity (Bannigan and Watson, 2009). Reliability is related to 'error in measurement' (McDowell and Newell, 1996, cited in Bannigan and Watson, 2009), and how far the data gathered by the instrument can be reproduced (Utwin, 1995, cited in Bannigan and Watson, 2009). Reliability can be evaluated by several methods for testing stability, internal consistency, equivalence and scalability. Stability can be assessed in 'test-retest reliability' (TRT) which examines the

results of repeated administration of the same instrument. If the same result is obtained in repeated administration this means the instrument is stable. Furthermore, the TRT of a trait scale is not expected to change over time (DeVon et al., 2007, p. 160). Internal consistency is applied to estimate how well the same concept is measured in groups of different items. High validity means the tool can actually assess what it aims to measure. Validity contains various categories and is complex (Matthews et al., 2009, p. 395). It includes face validity, content validity, criterion validity, concurrent validity, predictive validity, construct validity, convergent (and divergent) validity, factorial validity and discriminant validity. Validity should not be assessed using a single method (Bannigan and Watson, 2009). Convergent and divergent validity are used for reviewing the correlation between two survey scales in the same group. Criterion validity is usually applied to measure how well a set of variables from a test predicts future behaviour (Pennington, 2003). Criterion validity should be established in the early stage of developing a trait scale. In the review of DeVon et al. (2007) found that in most nursing research, content validity was reported most often. However, criterion and construct validity were rarely reported. The validity may have been under-reported because of the small sample size, poor research design, and inadequate psychometric testing resources. In published nursing research papers, a common defect is insufficient information on the psychometric properties of instruments and poorly conducted testing procedures.

When psychologists attempt to survey personality traits, they must be clear about how they are going to make use of the test results. For instance, a physician may try to use a patient's personality traits to confirm a diagnosis, or a human resource manager may want to see the possible fit between applicants and their job missions. Although investigators use well-developed questionnaires in the correct context, response biases can, in any event, come out. Three types of response bias should be considered: 1) Response Styles, 2) Impression Management, 3) Self-deception (Matthews et al., 2009). Response Styles bias arises when using multiple-choice scales; the respondents tend to endorse items without considering their actual content. Impression Management refers to the respondents

deliberately giving false answers. Self-deception represents the unconscious bias of people assigning themselves to more favourable or acceptable characteristics in questionnaire items than those which they actually possess. Six independent questionnaires comprised the quantitative strand survey tool: demographic question list, NEO-FFI-3, NSC, MBI-HSS, NJSS and BRS.

3.3.3 Demographic Survey

The demographic question list aims to obtain information about respondents' clinical ladders (clinical career progression), sex, age, educational level in nursing, the average years of experience in cancer nursing, education in cancer nursing, status of certification in cancer nursing, finally, years of intention to stay in nursing and cancer nursing (please see Appendix 3 for items in the demographic data survey). I expected that the years of experience in cancer care and attendance of cancer nursing specialist education might relate to stress levels, also I desired to know how well these independent variables predict the nurses' intention to stay; therefore this demographic questionnaire was formed.

3.3.4 Reliability Report of NEO-FFI-3

The NEO-PI-R and NEO-FFI-3 are used comprehensively in occupational psychology in exploring vocational interests, predicting likelihood of changing jobs, predicting work performance and adjustment. The 60 items forming the NEO-FFI-3 were developed from a short version NEO-PI-R, which was taken directly from the NEO Personality Inventory-3 (NEO-PI-3). In the report of equivalence coefficients between NEO-PI-R and NEO-FFI-3, the coefficients range from 0.87 to 0.95 so that NEO-FFI-3 is a reliable scale in measuring the full domains of the Big-Five personality; the respondents give their thoughts, feelings and goals by answering the items. The responses obtained can be compared with other adults' responses to give a description of their personality.

The internal consistencies (α or Chronbach's α) of NEO-FFI-3 for each item reported in adolescent, adult and middle school samples range from 0.66 to 0.88 (McCrae and Coast, 2010), which means the values of internal consistence regarded as acceptable (0.4-0.6) to satisfactory (>0.7) (Pallant, 2007). Although, the TRT (Test-retest reliability) of NEO-FFI-3 has not been studied, the TRT of NEO-PI-R in UK standardization samples ranges from 0.76 to 0.92 (Coast and McCare, 1992), which showed satisfactory (0.7) to the higher end of preferable (0.85-0.95) (Polit and Beck, 2006, p.326) stability. In the Professional Manual of NEO Inventories, it is also reported that NEO inventories are translated into more than 50 languages and have been used in multiple studies (McCrae and Coast, 2010), so that NEO inventories can be used worldwide.

The Likert 5-point scale is used in selecting the level of response statements. The responses to each statement are: 'strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree'. For example, in the statement 'I am not a worrier' (used in testing the level of N); if the respondents feel worried all the time, then they should choose 'strongly disagree'. Equally, the NEO-FFI-3 has two alternative versions, self-report form (Form S) and observer rating (Form R). In the present research, the self-report form is used.

3.3.5 Reliability Report of Nurse Stress Checklist (NSC)

The NSC includes a multiple construct of nurses' stress, under the dimensions of stimuli (stressors), responses to stimulus events, and environmental factors such as dilemmas over patient treatment (Tsai and Chen, 1996). The NSC is formulated on the basis of the transactional model of stress and includes Holmes Schedule of Recent Events as a validity measure (Benoliel et al., 1990). The NSC was translated into a version in traditional Chinese by Tsai (1993) and tested with Taiwanese nurses (Tsai and Chen, 1996).

The first developed version of the NSC includes 74 items with a 9-point, Likert-type

scale in four parts. High scores were recognised as agreement with the statements and conversely, low scores represented the subjects' disagreement (Benoliel et al., 1990). In the first part, the nurses were asked to check the events occurring in the preceding one week; the events contained the frequency of experiences of particular concerns in personal matter, professional work and environmental work demands. In part two, respondents were asked to rate their satisfaction with particular circumstances in the work concern, such as demands made by events encountered in work, or conflicts with supervisors. In part three the respondents were asked to report the frequency of various stress responses identified in previous literature, for example, 'I have had headaches'. In part four, the respondents had to choose how descriptive the statements were about their current situations. Exploratory factor analysis was applied to determine how many items remained in a small number of source variables under inclusion criteria consistent with the theoretical and empirical definitions of nursing stress. 47 of the 74 developed items were retained as indicators of the four facets of the nurses' stress construct.

The NSC was translated into a traditional Chinese version (Tsai, 1993) and tested with Taiwanese nurses in a medical centre with 2,200 nurses (Tsai and Chen, 1996). A random sample of 1,702 nurses was selected from 2,200 nurses: head nurses and nurses who did not offer nursing care to patients directly (e.g. nurses who worked in the infection control department or research departments) were excluded (Tsai and Chen, 1996). Five hundred and eleven questionnaires were completed and returned. The mean score of the NSC was 3.15 and the standard deviation (SD) was 1.13. Following exploratory factor analysis, four factors were retained in the end: personal reaction, work concern, role competence and work completion concern. One factor, personal concerns, was ignored, in contrast to the research of Benoliel et al. (1990). In addition, only 43 items were included while the original NSC contained 47 items; and Cronbach's α was 0.93 which can be referred to high internal consistency reliability. To conclude, the Chinese version of the NSC is a valid measure for displaying the stress phenomena of Taiwanese nurses.

3.3.6 Reliability Report of Maslach's Burnout Inventory (MBI-HSS)

The MBI-HSS, containing 22 items in the Chinese version, was used to measure three facets of work-related burnout: emotional exhaustion (EE), with nine questions; depersonalization (DP), with five questions; and personal accomplishment (PA), with eight questions. EE and DP are associated with negative outcomes of job burnout. In contrast, DP is related to positive influence on work outcome. Each item asks about how often the event depicted in a statement, for instance, 'I feel emotionally drained from my work', happens in people's lives. A 7-point scale is used to answer questions, from 0 (never happened), via 3 (a few times a month), to 6 (happens every day). Higher scores represent higher levels of job burnout.

In the latest study of the use of MBI-HHS in Taiwanese nurses (Lee et al., 2013), the reliability was checked in a pilot study. The reliability of the subscales EE, PA and DP were 0.90, 0.88 and 0.68 respectively, and the reliability of the entire measurement was 0.85. The reliability of the DP subscale was a fairly low, but still acceptable.

3.3.7 Reliability Report of Nurse's Job Satisfaction Scale (NJSS)

The NJSS was developed after reviewing the literature related to job satisfaction (please refer to Lin et al., 2007b, p.67). There are 18 questions related to job satisfaction included in the NJSS. The nurses tested are required to answer the questions by using a 5-point Likert scale ranging from 5 (very satisfied) to 1 point (very dissatisfied). Five domains identified from the relevant literature comprise the NJSS topics: job environment, human relationship, feedback, benefit and promotion, and workload.

Face validity was studied by an expert panel review; and from the experts' suggestion, the number of items was increased from 15 to 21. Item analysis was

used to eliminate items with lower discriminatory power (index less than 0.9). All 21 items have higher item-total correlation coefficients than 0.3, and the discriminatory power of all the items' was higher than 0.9. The high correlation coefficients indicated good correlation inside the measurement, and the high discriminatory power level displayed the discriminating function of each item. After principal component analysis, 4 factors were confirmed and 3 items were excluded. The reliability was examined by Cronbach's alpha and Pearson's correlation. The Cronbach's alpha calculation was 0.91, representing good internal consistency. The total score of Pearson's correlation was 0.74, showing that the NJSS possesses good TRT. To conclude, the NJSS is a good measure of job satisfaction among Taiwanese nurses with excellent validity and reliability.

3.3.8 Reliability Report and Translation Process of Brief Resilience Scale (BRS)

The Brief Resilience Scale (BRS) is one of the best-tested measurement tools for resilience. The BRS has been tested in various groups including: students, cardiac patients, chronic pain patients, rheumatoid arthritis patients, and healthy women (Smith et al., 2008; Smith and Zautra, 2008; Smith et al., 2009; Smith et al., 2010). The Brief Resilience Scale (BRS) (Smith et al., 2008) aims to test the intrinsic nature of resilience in its prime meaning; and the BRS was constructed around questions about the individual's ability 'to bounce back or recover from stress' (Smith et al., 2008, p. 199). The BRS is designed in connection with negative events: hard times, stressful events and set-backs; with six items in total. Three items are positively worded (1, 3 and 5), and the other three items (2, 4 and 6) are written in reverse. A 5-point Likert scale is used to respond to the items, from 1 to 5; 1 = strongly disagree and 5 = strongly agree. The BRS is considered to be a reliable and unique measurement tool in testing resilience; because it's good performance in high internal consistency and test-retest reliability. In addition, the BRS is superior in measuring resilience itself rather than exploring the factors or resources that influence personal resilience, such as the Resilience Scale (Wagnild and Young,

1993) and the Connor Davidson Resilience Scale (Connor and Davidson, 2003). The reliability of the BRS reported in a previous study with two student samples, one sample working with cardiac patients and one with chronic pain patients ranged from 0.80 to 0.91 in Cronbach's alpha (Smith et al., 2008).

The English version Brief Resilience Scale (BRS) was translated into traditional Chinese by me and back-translated into English by a Taiwanese nursing PhD candidate in the USA who possesses bilingual capacity. The back-translated BRS was reviewed by my supervisor and the author – Smith B. W. (Smith et al., 2008), and they compared the meaning of each item between the original and the back-translated versions. Both the English version and Chinese version of BRS will be checked by another PhD student who is fluent in both English and Chinese. All of these processes were completed before the BRS was used.

3.3.9 Pilot Questionnaire Survey

The purpose of a pilot study is to allow researchers to undertake a small-scale version of the designed research (Polit and Beck, 2006). For the purpose of establishing the feasibility of the questionnaire contents and the schedule, both questionnaire survey and face to face interview were piloted prior to the formal study. The whole questionnaire contained 166 items and all the independent questionnaires, except the demographic question list, have been translated from English into traditional Chinese by the above-mentioned Taiwanese scholars (Tsai and Chen, 1996; Lee et al., 2013) and me. The pilot study is necessary to know the approximate time to answer and check if the questionnaire are understandable and make sense to cancer nurses; this could be referred to the face validity (Jackson and Furnham, 2002) of the selected questionnaires. Five experienced cancer nurses including two head nurses, two nursing practitioners and one study nurse from the cancer ward in CMUH were invited to complete the questionnaire after they had finished the survey. They were asked to answer a questionnaire with open questions to check if they experienced any difficulty in understanding the information sheet and the items in questionnaires; whether the duration of

completing the questionnaire was acceptable; and whether they could offer any advice about this research (for the formal questions see Appendix 4).

3.3.10 Sampling

The sampling plan should indicate the criteria for selecting participants and estimate how many cases are needed (Polit and Beck, 2006). Purposive sampling was used in this research; this approach allowed the selection of potential participants who conformed to the research interests (Silverman, 2013). The nurses who work in the KFSYCC, a regional hospital only for cancer treatments; and the other 15 cancer specialist wards in CMUH, TNUH and TVGH were the target population; nurses who do not offer direct clinical care to cancer patients such as head nurses, case managers, and nursing specialists were excluded from the sample because their work responsibility and contents were different from those of the front line clinical nurses. Cancer nurses who offer daily clinical care in ward and nurses who work in outpatient chemotherapy rooms were recruited.

The available population was 444 nurses; questionnaires were put in brown paper envelopes for anonymity and dispatched. The inclusion criteria were: nurses who provide clinical care to patients in cancer wards; the exclusion criteria were: nurses who do not offer direct clinical care to cancer patients, such as cancer case managers, nursing practitioners (specialists), head nurses, nurse supervisors, theatre nurses and nurse assistants. According to the data analysis method in this research – Structural Equation Modelling (SEM) - the minimum sample size should be no less than 100 (Kline, 2011) and Ding et al. (1995) synthesised several research results and concluded that 100 to 150 sample size is an appropriate range in SEM; if the size greater than 500, the value of chi-square will be large; which indicates that the data and hypothesised model do not fit adequately (Barrett, 2007). Jackson (2003) indicated that the ratio of variables in a model to the sample size should be 1:20; 1:10 is the smallest requirement when the researchers use maximum likelihood estimation. This research included 11 variables; they were five personality traits, stress level, three dimensions of burnout, job satisfaction

level and resilience. Therefore, the sample size should be 110 – 220. Overall, the appropriate sample size for SEM should range between 200 and 500 (Schumacker and Lomax, 2004). Considering the response rate based on previous research in nurses (Tsai and Chen, 1996; de Carvalho et al., 2005; Chen et al., 2007; Lin et al., 2007b), the estimated response rate ranged from 81 to 99 % in related research; therefore, the target sample size was 200 to 444 to match the criteria sample size in SEM. This research had to include four hospitals to reach the target sample size.

3.3.11 Data Collection Procedure

After obtaining ethical approvals from each hospital and the University of Hull, the head nurses and supervisors of cancer wards were assembled; the research student gave a presentation about this research project and the process of dispatching and collecting questionnaires. The head nurses were encouraged to ask questions after the presentation, and they were free to contact the research student whenever they had any problem. In CMUH, the study was explained to nurses during morning meeting or meetings were held in wards. However, in the other three hospitals the chief of the nursing department, supervisor and some head nurses requested dispatch by head nurses.

Six independent questionnaires and an incentive voucher (2 pounds) were loaded in envelopes, and information sheets (please refer to Appendix 5) were attached on the top of envelopes. The information sheets on the envelopes aimed to give full information about the objectives; inclusion and exclusion criteria; questionnaire survey process; the purpose and process of face-to-face interview; how to attend interview; possible harm or inconvenience from joining this research; anticipated benefit; voluntary of participation, and how to end or withdraw from this research; assured confidentiality; data management; compensation; researcher's name and contact details such as address, phone number and e-mail; and how to make a complaint. Forms of information sheets were various; this was due to the requirements of the ethics committee in each hospital.

In terms of completing questionnaires, it was not necessary to obtain participants' informed consent because the questionnaire survey was totally anonymous and confidential, and completion and return of a questionnaire was taken as implied consent. Nurses who were willing to attend a face-to-face interview could leave their personal contact information on the demographic page which was the first page of the questionnaire papers. The nurses were given seven days to complete the questionnaires and return them by using the self-adhesive envelopes, then putting the envelopes into a sealed box (KFSYCC and NTUH) or handing them to their head nurses (CMUH and TVGH).

3.3.12 Data Management and Analysis

The aim of data analysis is 'examining the database to address the research questions or hypothesis' (Creswell and Plano Clark, 2010, p. 207) by using multiple analysis methods. This study aims to explore the relationship between personality and stress, burnout, job satisfaction and resilience in cancer nurses. The information collected in the hard copy questionnaires was keyed in and saved in SPSS 20; SPSS 20 was used for descriptive statistics, and Amos 20 (Analysis of Moment Structures - software of Statistical Product and Service Solutions) was used in inferential statistics. Descriptive statistics, t-test, ANOVA and structure equation modelling (SEM) were used to analyse the data. The demographic information, personality trait scores, levels of job stress, burnout, satisfaction and resilience are presented in descriptive statistics. Differences between groups were examined by t-test and ANOVA. Hypothesised models will be tested in SEM with AMOS.

Missing data in social science research or questionnaire surveys seem inevitable. Almost all the latest versions of statistical software can deal with missing data by deletion or imputation. Mean substitution was chosen to deal with missing data of measurement scales; missing data in the demographic survey was excluded in descriptive statistics. The missing data for each item in my research did not exceed 10%, hence, mean substitution maintained the maximum sample size for data

analysis without decreasing the standard deviation and the occurrence of type I error (Chang and Cheng, 2012).

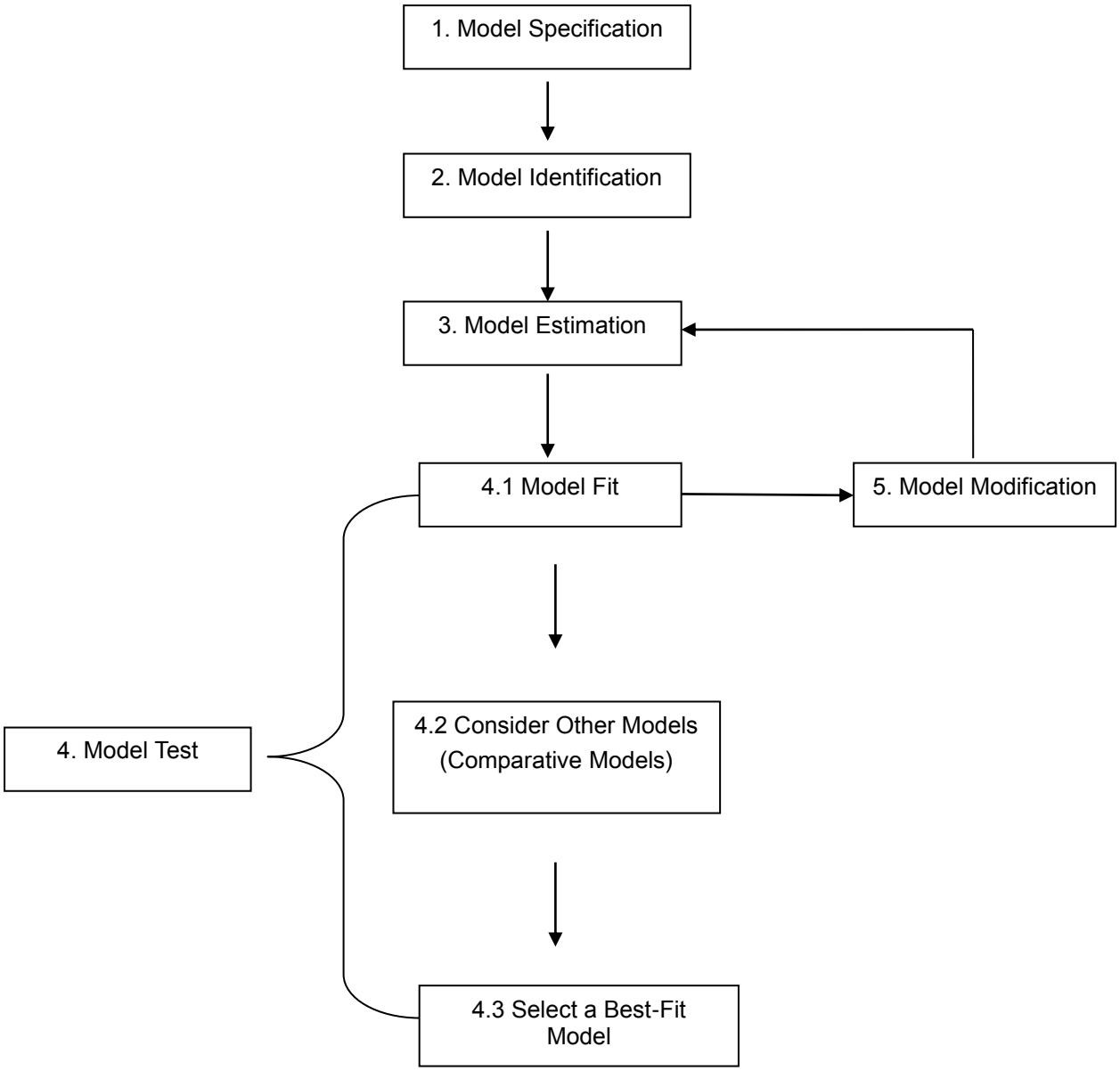
Demographic data were displayed by descriptive statistics: the mean scores, standard deviation, frequencies and total scores were used in presenting data in stress, burnout, job satisfaction and resilience. The t-test was used to explore the difference between two groups by comparing the mean scores of continuous variables (Pallant, 2007). Thus, the t-test was applied to test the differences of stress, job satisfaction and resilience total score levels between diverse groups including nurses working in public hospitals or in private hospital; nurses who have family members working in nursing or not; nurses who have completed the module in cancer nursing in school or not; nurses who have completed the Oncology Nursing Training hold by the Oncology Nursing Society of Taiwan or not; and nurses who hold the license of Oncology Nurse or not. Additionally, Analysis of variance (ANOVA), which is similar to t-test but used when there are more than two groups in comparison (Pallant, 2007), was performed to test the stress, job satisfaction and resilience scores among nurses on different steps of the clinical ladder; nurses on different nursing educational levels; and years of experience in cancer nursing. The correlation strength between stress and nurses' age, also years of experience in cancer nursing was measured in Pearson correlation coefficient. Cronbach's α was used to check the internal consistency of each independent questionnaire.

SEM possess many advantages compared with traditional statistics, it can be used to carry out path analysis, confirmatory and exploratory factor analysis, evaluation of complex models with multiple dimensions (Cunninham and Wang, 2005). While researchers are testing the relationships among multiple variables in multiple linear regressions, they have to face the diminution of intervals of confidence and increasing type I error due to repeated regressions; on the other hand, type I error can be largely minimised by using SEM.

Path analysis (PA) contains a series of regression analysis. It is a statistical method used in exploring causal structural models with multiple variables. In SEM, path analysis is a special exemption; that means observed variables instead latent variables. PA is not able to confirm causation; it is only used to confirm the data fit to assumptive models (Garson, 2014). SEM was the prime choice for relationship analysis of this research's hypothetical model, shown in chapter 1 (Figure 3), in virtue of its complex paths and total effect (total effect = direct effect + indirect effect) between variables.

When using SEM, the statistic assumptions, such as that the data collection needs to fit in a multivariate normal distribution must to be followed up strictly. Similarly, researchers have to process the steps of SEM analysis exactly. In that way, the analysis results are more acceptable to other researchers or reviewers. The steps of operating SEM analysis are presented below (Figure 6):

Figure 6. Steps of SEM Analysis



3.4 Qualitative Research Strand

3.4.1 Introduction

As opposed to quantitative studies, qualitative research methods come from the naturalistic paradigm, which sees reality as built by individuals in multiply, subjectively and mentally constructed in a context (Polit and Beck, 2006). Researchers who use qualitative methods mainly rely on interacting with the individuals being researched and obtain findings by interpreting participants' voices. The findings in qualitative research are usually subjective, experience-related, non-quantifiable, narrative, and contextualised; in addition, the findings may be various results from different researchers' interpretations.

3.4.2 Face-to-face Interview

Face-to-face, one to one semi-structured interview was selected as the qualitative method. In qualitative research, face-to-face interview is recognised as a valid self-report survey method because it is able to offer good quality personal information (Polit and Beck, 2006). Silverman (2013) defined this popular approach 'is to regard participants' narrative answer as 'describing some external reality or internal experience' (p. 238). The purpose of using face-to-face interview in this research was to obtain more in-depth data from participants to confirm, reflect and underpin the findings in the quantitative survey. The major aim was extracting meaningful themes from interviewees' voices to explain the interrelationship between personalities, stress, burnout, job satisfaction and resilience. In this research, the participants were guided to tell their own stories and the researcher gathered and then interpreted the data.

Self-developed open-ended questions were used as the interview guide. The questions were designed according to the variables in the questionnaire survey, that is, they were related to personality, stress, burnout, job satisfaction level and

resilience. For instance, the question 'Could you describe what sort of person you are?' was developed to encourage participants to think about their experiences and what personality they think they have. Another example question, 'How do your personal characteristics make you behave in your job?' was designed for the purpose of understanding the cancer nurses' views associated how their personalities influence their work. Eight items were used for the main questions; in addition, probing questions were used to obtain more in-depth information and avoid awkward silence. For the content of questions please refer to Appendix 6.

3.4.3 Pilot Interviews

Three nurses who had worked in cancer wards were invited to take part in the pilot interviews. The pilot interviews helped the researcher to investigate whether that the interview questions were appropriate and understandable. Probing questions were developed and confirmed from the pilot interviews. All three interviews were transcribed and translated into English; the supervisors checked the transcriptions for reliability and gave advice in interview skills. Respondents in both the pilot questionnaire survey and participants in the pilot interview survey were excluded from the data.

3.4.4 Sampling

The nurses who completed the quantitative questionnaire survey and volunteered to attend face-to-face interviews left their contact details at the end of the demographic questionnaire; they were contacted and we arranged mutually convenient meeting times and places. The purpose of using the same individuals for the quantitative and the qualitative strands in mixed method research is to use the qualitative data to support the quantitative findings or to supply more detail (Creswell and Plano Clark, 2011). The number of participants was difficult to estimate; not only because the number of participants in qualitative research should be decided depending on the extent of the saturation of the collected data

(Polit and Beck, 2006), but also on the number of volunteer interviewees after the first stage questionnaire survey. The principles for recruiting interviewees were: 1) recruit interviewees equally from the four hospitals with the aim of recruiting 10 participants from each hospital; 2) if the number of volunteer participants is large, the researcher should select participants depending on the results of the personality test. Participants should be chosen from nurses who possess certain personality traits equally; for example, two participants from each personality. Therefore, the ideal number of interview participants was 40 in this research.

3.4.5 Data Collection Procedure

Nurses were contacted to attend interview when they had left their names, contact details such as mobile phone number and e-mail address, and a convenient contact time in the demographic survey questionnaire. The researcher contacted them and made appointments with them at the time and date that participants wished. The participants agreed to be interviewed in a conference room inside the ward or head nurses' office, when the head nurses were not on duty; these private spaces allowed the participants talk freely without interruption.

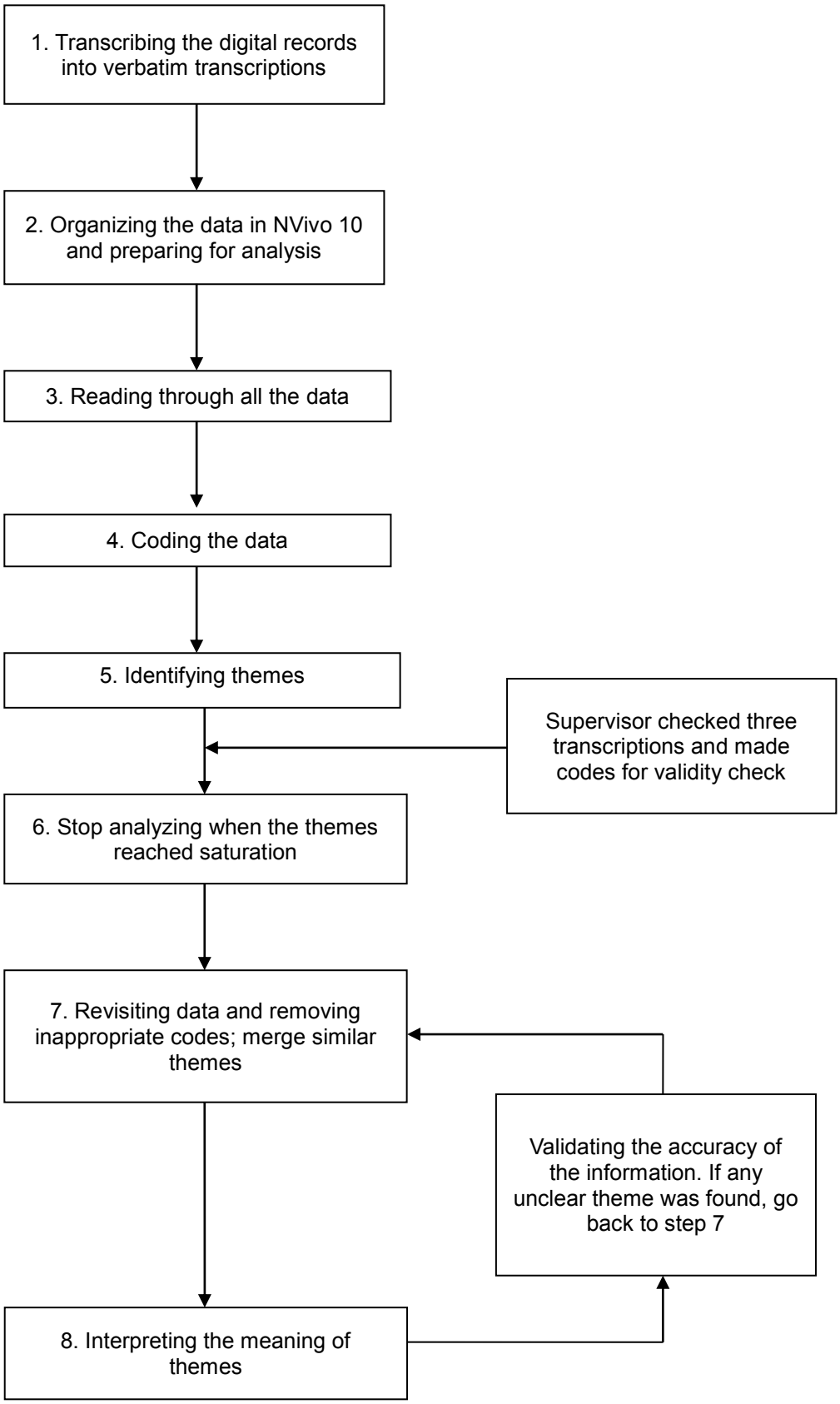
At start of the interviews, I introduced myself and explained the purpose and process of this study and the reasons for inviting them to the interview, by explaining the informed consent forms. The participants were encouraged to ask any questions about the study, and they were fully informed of their rights as research participants; such as that they have the right to withdraw from this study or refuse to answer any question without giving explanation, and how confidential their interview would be. After demonstrating they completely understood and agreed to join this study, the participants and researcher signed the informed consent forms simultaneously. Then the interview proper started with talking about the participant's recent work conditions. The content of the interview was recorded by a digital recorder and the estimated interview time was 30 minutes. The participants received 4 pound incentive voucher at the beginning of the interview.

3.4.6 Data Analysis

All the interviews were recorded by a digital recorder. I transcribed the interview contents into verbatim transcriptions and saved the data in Word. NVivo 10 was used to organise transcriptions. Applying qualitative data analysis software (QDAS) has become more and more popular recently although some qualitative researchers still have doubts; qualitative researchers who conduct studies involving large numbers of cases, countries, or multimedia especially tend to use QDAS during data analysis. QDAS is particularly helpful when researchers deal with merging, synthesizing and making comparison of the analysed or categorised data. In addition, data analysis processes with QDAS such as NVivo are very flexible (Bazeley and Jackson, 2013).

Content analysis was selected as the analysis method. Content analysis is flexible and widely used to analysis various kinds of data; and it is suitable for a researcher who intend to less interpret the data (Vaismoradi et al., 2013). When coding work was finished, all codes were reviewed and merged if the codes were similar and could be integrated as the same theme. The definition of content analysis proposed by Silverman (2013, p.443) involved 'establishing categories and systematic linkages between them, and then counting the number of instances when those categories are used in a particular item of text'. In this study, seeking agreement and disagreement between theoretical constructions and reality was more important than counting the frequency of occurrence in transcription. Furthermore, content analysis matches the objective of using a qualitative research method in this study; that is, checking the validity of selected questionnaires and capturing significant themes to answer the research question. Figure 7 shows the process of content analysis used in this research. The rules of selecting transcription for analysing as priority were: 1) including participants from four hospitals; 2) interviews with rich answer to interview guide were recruited first.

Figure 7. Steps of Content Analysis



All the steps above involved taking notes of any emerging ideas for later data categorization. The first to third steps were preparations for coding in the fourth step. In content analysis, themes can be identified 'on the basis of what is in the data … where the researcher uses the data to explore particular theoretical ideas … it also can be used to develop a critical, constructionist analysis which can identify the concepts and ideas that underpin the explicit data content, or the assumptions and meanings in the data' (Braun and Clarke, 2013, p. 178). The fourth step was coding the data. Coding is a strategy to 'see across the data, and above the individual documents, to themes and ideas' (Richards, 2009; p.93). Coding involves several steps (Richards, 2009). First, reading through the whole transcript and looking for interesting or meaningful material according to the research question; in this study, the dimensions in questionnaires such as personal responses and significant relationships in the quantitative results were searched for. Second, gathering data and allocating the data under nodes; for example, putting codes with similar meanings under a nodes such as emotional exhaustion. Third, organizing the nodes into category trees; for instance, emotional exhaustion, depersonalization and personal accomplishment should be allocated under the broader category burnout. Fourth, checking the association of any new topic with the research question and placing it in the category tree or in a new category. In this study, topic coding which mainly allocates passages to topics with little interpretation, was used. In step five, the defined theoretical components/dimensions included in NEO-FFI-3, NSC, MBI-HSS, NJSS and BRS were used as thematic searching points when coding data. Other concepts related to personality, nurses' stress, burnout, job satisfaction and resilience levels but not fitting the questionnaire dimensions, and relationships which reflected the significant relationships in the quantitative results, were given new nodes.

During the progress of step five, my supervisor code three transcripts to check if the same themes emerged from the data, until no more new information or codes or themes could be extracted from transcriptions. This step was analogous to inter-rater reliability which aims to check if there were any problems or disagreement in coding by at least two researchers independently (Braun and Clarke, 2013). The

sixth step was to stop coding. The seventh step was revisiting the codes and themes, removing inappropriate codes, referring back to the raw data when necessary. In addition, similar themes were integrated and merged in this step. The final step was interpreting the meanings of themes, also checking the accuracy of the information of meaning, interpretation and quotations. If any unclear theme was found, step seven would be repeated.

3.5 Conclusion

A good mixed method study should be conducted in using accurate measures with generalizable results. The whole study process should as well be valid, reliable and reproducible (Creswell and Plano Clark, 2011): the design of the current research was based on the need to answer the research question. In this study, questionnaire survey and face-to-face interview were used. Questionnaire survey is most common used research tool in psychology field; it is objective and convenient for collecting plentiful data within a short time period; also, well-developed and tested questionnaires were used. Quantitative data allow the relationships among variables to be tested. The purpose of including a qualitative research method is to confirm the significant relationships between variables in quantitative data analysis, as well as to see whether the questionnaires selected for this research are able to truly explore cancer nurses' personality, resilience ability, stress, burnout and job satisfaction level in translated versions.

Chapter 4 Results

4.1 Introduction

This chapter presents the research results addressing the question: 'What is the relationship between personality traits and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses'. Results are separated into two main parts: those from the questionnaire survey, and those from the interviews.

First, in the report comes a description of the results of the questionnaire survey and interview pilot studies. Second, the numbers of responses returned and of the participants who took part; followed by details of the demographic data is presented. Third, the validity and reliability of each measurement are demonstrated. Next, the comparative models are shown with six predictive models were tested to find out the best fit model. Then five personality traits and three burnout factors were substituted under the best fit model to calculate the strengths of relationships between variables. Finally, the mean of years of intention to stay in current job as cancer nurses is added into the model to understand the predictive abilities of stress, job satisfaction and burnout of intention to stay in cancer nursing.

After the significant relationships between personality, resilience, stress, burnout and job satisfaction are recognised, content analysis of interview transcription is used to confirm, underpin and explain the findings in all relationships.

4.2 Demographic Characteristics of Sampling

Four hundred and forty-four questionnaires were dispatched. In total 411 questionnaires were returned: the response rate was 92.57%. The distribution of nurses in the four hospitals is shown in Table 3.

Table 3 Nurses' distribution in four research sites

Hospital	Number of participants	
CMCH	49	Private
KFSYSCC	163	Private
NTUH	64	Public
TVGH	135	Public

Table 4 presents the demographic data of 411 nurses. 405 nurses were female and five were male: one nurse did not give the answer to sex. 65nurses were in clinical ladder1 N0 (15.8%), 107nurses were in N1 (26.0%), 177 were in N2 (42.1%), 42 and 22 nurses were in N3 (10.2%) and N4 (5.4%) respectively. The mean age was 28.74 (SD: 5.92). 51 nurses had completed the diploma of junior college (12.4%); 344 nurses possess bachelor degrees (83.7%), 14 nurses had Master's degrees and only one nurse has a PhD degree. The average years of experience in cancer nursing was 5.2 years. 156 respondents have nurses in the family (38.1%), and 254 respondents have family members with cancer (61.8%). Approximately 67% nurses had attended the model module of cancer nursing in school (n=283) (68.9%); 43% nurses (n=176) had completed the Oncology Nursing Training hold by Taiwan Oncology Nursing Society and 26% (n=106) nurses had passed the exam by the same society and held the oncology nurse license. The mean time which respondents intended to stay in nursing was 9.5 years. In the meanwhile they intended to stay in the current job as cancer nurses for 6.4 years on average. All of the demographic results demonstrated a wide range of included participants and enhanced the generalisability of this study.

[1]

Clinical ladder in Taiwan	
No-N1	Novice/Beginner
N2	Advanced beginner
N3	Competent
N4	Proficient

Table 4 Demographic data of respondents

Variable	Mean (Year)	Frequency	Percent (%)
Age	28.7		
Gender			
Male		5	1.2
Female		405	98.5
Education level in Nursing			
Junior College Diploma		51	12.4
Bachelor Degree		344	83.7
Master's Degree		14	3.4
PhD Degree		1	0.2
Clinical ladders			
N0		65	15.8
N1		107	26
N2		173	42.1
N3		42	10.2
N4		22	5.4
Years of Experience in Cancer Nursing	5.2		
Have nurses in the family			
Yes		156	38.1
No		253	61.6
Have family members with cancer			
Yes		254	61.8
No		157	37.5
Complete the module of cancer nursing in school			
Yes		283	68.9
No		123	29.9
Complete the Oncology Nursing Training			
Yes		176	42.8
No		232	56.4
Have Licence of Oncology Nurse			
Yes		106	25.8
No		302	73.5
How long intend to stay in nursing	9.5		
How long intend to stay in present job	6.4		

4.3 Pilot Study

A pilot study is necessary before formal data collection by following the process of the interview and questionnaire survey as planned proposal. The participants selected need to have to possess the same characteristics as those of the target sample (Watson et al., 2008). After interview, or completing the survey, participants are able to give their opinions about any difficulty or ambiguity when answering the questionnaire; also, they can offer advice as to the arrangement of the interview schedule or the questionnaire content (Watson et al., 2008).

4.3.1 Quantitative Pilot Study Results

Five nurses who worked as cancer nurses and were working in cancer ward as head nurses (n=2), nursing practitioners (n=2) and a case manager (n=1) were invited to join the questionnaire pilot study. After completed the questionnaire survey, they filled in another questionnaire (please refer to Appendix 4) including four questions to give feedback and further comments for questionnaires. Overall, the cover sheet was clear and easy to understand, and no participants thought any important information was missing in it. In terms of the questionnaires, one nursing practitioner felt a little confused about the 18th item in Maslach's Burnout Inventory (MBI) – 'I feel exhilarated after working closely with my recipients'. I asked her about further suggestion to revise this question; she replied that she still was able to understand this question although she claimed 'work with recipients' was a bit odd. As for the other questionnaires, two participants had comments on the Nurse Stress Checklist (NSC). One nursing practitioner indicated that the questions in NSC did not fully represent the stressors that cancer nurses face in work; one head nurse felt that the answer selections based on a 9-point Likert's scale are too many, she indicated that the selections could be reduced. Since the NSC aims to test cancer nurses' stress levels on both work and daily living, the questions seem more comprehensive. However, the NSC was developed in 1990 (Benoliel et al.), some revision could be made in future study. On the other hand, the 9- point Likert's scale used in the NSC was tediously long compared to other

questionnaire used in this study; but it requires further large scale research to edit it; therefore, the original questionnaires remained unchanged.

4.3.2 Qualitative Pilot Study Results

Before the interview started, I explained informed consent to the participants with the full information related to this research, as well as their rights. After that, they agreed and signed the consent. The interview guideline containing 8 questions (please refer to Appendix 6) was used in the pilot interviews. Three interviews were done one to one and the records were transcribed and translated into English each time as the interview was completed. My supervisors read the transcriptions and gave comments on the processes and my interview skills. After the third pilot interview, they agreed that I was prepared and that I could start to interview nurses. In the meanwhile, I developed several probing questions related to my interview guideline during the pilot interviews.

4.4 Reliability of Measurements

In questionnaire survey research, reliability reporting is indispensable. Reliability refers to the consistency of reflecting the component which the measurement aims to measure. In SPSS, reliability can be tested easily. Cronbach's alpha is the most important and commonly used value to measure a questionnaire's reliability. Field (2013, p. 709) cited Kline (1999), who had identified that 0.7 is more suitable as a cut-off point to decide that a measure possesses good reliability; however, in psychological testing, values even below 0.7 are expected and realistic due to the various and complex construct being measured. This is echoed by DeVellis (2003) assertion in Pallant's SPSS manual (2007, p. 98), that value above 0.7 is acceptable whereas value above 0.8 is preferable. Moreover, Field (2013, p. 709) provided Crobach's (1951) suggestion that measurement constructed in several factors should have separate reliability tests in each factor with its items. Above the fact that Chronbach's alpha for the overall reliability should be reported, two values in

the output need to be checked. One is corrected item-correlation and the other is Cronbach's Alpha if the item is deleted. According to Field's (2013, p. 713) definition, corrected item-total correlation is 'the correlations between each item and the total score from the questionnaire', and it represents good reliability if the value is greater than 0.3. The questionnaire user has to consider deleting those items that have corrected item-total correlation less than 0.3, because they are not correlated with the total scale very well. Regarding Cronbach's Alpha if an item is deleted, if the value is greater than the overall Cronbach's Alpha and the difference is large, we may consider deleting the item. That is because deleting the item could improve the questionnaire's reliability. The output results of the reliability tests of each questionnaire are displayed in detail in Appendix 7, and the total reliability in Chronbach's alpha of individual questionnaire is listed in Table 5.

Table 5 Reliability test of questionnaires

Scale	Sub-scale	α
NEO-FFI-3		
	Neuroticism	0.876
	Extraversion	0.781
	Openness to Experience	0.757
	Agreeableness	0.687
	Conscientiousness	0.777
Nurse Stress Checklist		0.953
	Work concerns	0.938
	Personal responses	0.926
	Competency	0.889
	Incompleteness of personal arrangement	0.848
Maslach's Burnout Inventory		
	Emotional exhaustion	0.896
	Depersonalization	0.811
	Personal accomplishment	0.837
Nurse's Job Satisfaction Scale		0.923
	Job environment	0.812
	Human relationship	0.911
	Benefit and promotion	0.938
	Workload	0.749
Brief Resilience Scale		0.760

There is no report of total scale reliability in NEO-FFI-3 and MBI-HSS as the sub-scale represent disparate dimensions of the latent trait and cannot be summated. The Chronbach's alphas (α) of each sub-scale in the NEO-FFI-3 were: Neuroticism (α=0.85), Extraversion (α=0.78), Openness to Experience (α=0.6), Agreeableness (α=0.69), and Conscientiousness (α=0.78); in MBI-HHS: Emotional exhaustion (α=0.90), Depersonalization (α=0.81) and Personal accomplishment (α=0.84). Although the α of Agreeableness in NEO-FFI-3 was 0.69 this is still acceptable in psychological research (Field, 2013). The Nurse Stress Checklist showed very good reliability (total scale α= 0.95), and all of its sub-scale's α were greater than 0.8 (ranged 0.85 - 0.94). In terms of Nurse's Job Satisfaction Scale, the overall scale α=0.92, and only sub scale in workload had α =0.75. The Brief Resilience Scale had acceptable reliability at α=0.76. Although some items may be removed to improve the reliability; due to the overall Chronbach's alphas are good to very well, the differences of Cronbach's alpha if Item deleted and Cronbach's alpha are all small, the copyrights of all questionnaires belong to companies or scholars and all changes require further processes in translation-back translation, factor analysis, therefore, no change was made in questionnaires components.

4.5 The Distribution of Data

4.5.1 Normality and Mean

The normal distribution is especially important in testing significance. An accurate *p*-value can be obtained only with a normal distribution. (Field, 2013). Usually, skew and kurtosis are used to check the normality of data distribution. In AMOS model outputs, the normality of each variable is displayed. Kline (2011) suggested that the skew should range from -2 to +2; the kurtosis should not be above 7. In this study, all variables were normally distributed (Table 6).

The mean of nurses' stress level was 3.43, which was low to medium (scores range from 0 to 8, the middle score is 5). The mean of emotional exhaustion is 30.07

which can be described as high, that of personal accomplishment is 33.43 and that of depersonalization is 9.39 which is considered to be moderate.

Table 6. Descriptive statistics of stress level, burnout and job satisfaction resilience

		Stress Level	Emotional Exhaustion	Personal Accomplishment	Depersonalization	Job Satisfaction	Resilience
N	Valid	388	396	396	401	390	395
	Missing	23	15	15	10	21	16
Mean		3.431	30.07	33.43	9.39	3.2516	3.0169
Std. Deviation		1.30066	10.764	7.268	6.267	0.53543	0.60209
Skewness		0.036	-0.045	-0.437	0.679	-0.06	-0.19
Std. Error of Skewness		0.124	0.123	0.123	0.122	0.124	0.123
Kurtosis		-0.351	-0.584	-0.247	-0.088	-0.108	0.241
Std. Error of Kurtosis		0.247	0.245	0.245	0.243	0.247	0.245
Minimum		0.32	1	10	0	1.68	1.33
Maximum		7.55	54	48	29	4.84	5

4.5.2 The Relationship between Demographic Data and Stress Level

Stress, Job satisfaction and Clinical Ladder

One-way ANOVA was used between groups to explore the impact of a respondent's level on the clinical ladder on stress and job satisfaction. There are five groups defined by their position on the clinical ladder: N0, N1, N2, N3 and N4. The ladder level indicates certain abilities at that level, and nurses must be qualified at their current ladder level before they can upgrade to the next. First, the Levene's statistical test of homogeneity of variances was checked. In terms of stress, Levene's test was non-significant: 2.349 (p=0.054). This means the data are normally distributed and the ANOVA test is significant. As a result, there is a

statistically significant difference in stress among groups: F (4, 381) = 9.61, p<0.001. Post-hoc comparison with the Tukey HSD test demonstrates that the mean score for group N0 (M=4.09, SD=1.08) is significantly different from that of group N2 (M=3.19, SD=1.34), group N3 (M=3.04, SD=1.32) and group N4 (M=2.84, SD=1.05). The mean score of N1 group (M=3.75, SD=1.18) is significantly different from all except the N0 group. Overall, the stress decreases the higher nurses are on the clinical ladder. There was no significant effect of clinical ladders on job satisfaction. (Tables 7 & 8)

Table 7. ANOVA Test – Stress, Job Satisfaction and Clinical Ladder

	ANOVA						
	Levene statistic (significant)	df (Between, Within)	F	*p*	N	Mean	SD
Stress	2.349 (.054)	4, 381	9.611	<0.001			
Group1					61	4.085	1.081
Group2					96	3.753	1.181
Group3					166	3.189	1.342
Group4					41	3.037	1.316
Group5					22	2.842	1.052
Job Satisfaction	2.205 (0.068)	4, 383	1.311	0.265			
Group1					61		
Group2					101		
Group3					164		
Group4					40		
Group5					22		

Group Number: 1=N0; 2=N1; 3=N2; 4=N3; 5=N4

Table 8. Multiple Comparison by Tukey HSD in ANOVA Test – Stress and Clinical Ladder

Multiple Comparison by Tukey HSD

Stress	Group Number	Mean Difference	*p*
	1-3	0.897	<0.001
	1-4	1.048	<0.001
	1-5	1.243	0.001
	2-4	0.716	0.019
	2-5	0.911	0.018

Group Number: 1=N0; 2=N1; 3=N2; 4=N3; 5=N4

In the Multiple Comparison by Tukey HSD column, only significant differences are reported ($p<0.05$)

Stress, Job Satisfaction, Resilience and Education Level

One-way ANOVA was also conducted between groups to explore the effects of educational level on stress job satisfaction and resilience. Participants were divided into three groups; group 1, diploma of junior college; group 2, bachelor degree; and group 3, postgraduate degree (Table 9).

First, the impact on stress was examined. From the test of homogeneity of variances Table, the Levene's Statistic of 0.045 was significant (p>0.05); which means the variances are significantly different and the assumption of ANOVA is violated. Therefore the Welch's statistic and the Brown-Forsythe statistic were examined; and the Games-Howell Post–Hoc multiple comparison was used (Field, 2013). The Welch's (p =0.05) and Brown-Forsythe statistics (p =0.03) are significant (<0.05), reflecting a significant mean difference among the three education groups in stress levels. Welch's statistic is reported: F (2, 33.327) = 6.18, p =0.005 (< .05), and Brown-Forsythe test F (2, 68.475) = 6.301, p =0.003 (< .05). The Games-Howell test results indicate the mean score of group bachelor degree nurses (M=3.53, SD=1.27) is significantly different from diploma or junior college (M=2.96, SD=1.45) and postgraduate degree (M=2.85, SD=0.94). There is no significant difference between group 1 and 3. Cancer nurses with a bachelor degree have higher stress than other groups. There was no significant differences in job satisfaction among different educational level groups.

Finally, I investigated if education level influences resilience. The Levene's statistic=3.205 was significant (p= 0.042), therefore, the next step was to examine the Welch's statistic and Brown-Forsythe statistic. In addition, the Games-Howell Post–Hoc multiple comparison was calculated. The Welch's statistic (0.499) and Brown-Forsythe statistic (0.426) were both non-significant (p<0.05) (Table 10), which implies the null hypothesis: that there is no significant different in the mean scores of resilience among groups, cannot be rejected; that is, the educational level fails to explain the variance of resilience and there is no significant difference in the mean of resilience across the three groups.

Table 9. ANOVA Test – Stress, Job Satisfaction, Resilience and Education Level

	ANOVA							
	Levene (significant)	statistic	df	(Between, Within)	F	*p*	N	Mean	SD
Stress	3.126 (0.045)		2, 384		✝				
Group1							46	2.956	1.447
Group2							326	3.529	1.274
Group3							15	2.854	0.936
Job Satisfaction	0.391 (0.677)		2, 386		0.084	0.920			
Group1							46	3.280	0.505
Group2							329	3.250	0.540
Group3							14	3.230	0.575
Resilience	3.205 (0.042)				✝✝				
Group1							49	3.050	0.581
Group2							331	3.000	0.588
Group3							14	3.260	0.905

Group Number: **1**=Diploma of Junior College; **2**=Bachelor Degree; **3**=Postgraduate Degree

On the Multiple Comparison by Tukey HSD column, only significant differences are reported (p<0.05)

✝ The Levene statistic is significant, therefore Welch and Brown-Forsythe statistic need to be done

✝✝ The Welch and Brown-Forsythe statistic are both non-significant, p= 0.499 and 0.426.

Table 10. Post-Hot Comparison of ANOVA Test – Stress, Resilience and Education Level

Welch, Brown-Forsythe Tests and Multiple Comparison by Post-Hot Tests

Stress	Welch (*p* value)	Brown-Forsythe (*p* value)	Group Number	Mean Difference	*p*
†	0.05	0.03	†† 1-2	-0.574	0.035
			2-3	0.675	0.040

Welch and Brown-Forsythe Tests

Resilience	Welch (*p* value)	Brown-Forsythe (*p* value)
	0.499	0.426

Group Number: **1**=Diploma of Junior College; **2**=Bachelor Degree; **3**=Postgraduate Degree

† The Welch and Brown-Forsythe statistic are significant, therefore Post-Hot tests is applied to instead of Tukey HSD.
Only significant differences are reported (p<0.05).

†† The Games-Howell tests in Post-Hot tests are reported.

Stress, Job Satisfaction and Years of Experience in Cancer Nursing – One Way ANOVA test

The years of experience in cancer nursing was tested to understand its impact on stress (Table 11). The nurses were divided into group 1, less than 1 year or just 1 year (work year ≦1year); group 2, more than 1 year to just 2 years (1< work year ≦2); group 3, more than 2 years to just 5 years (2< work year ≦5); and group 4, more than 5 years (work year≧5). From Table 11, the Levene statistic=2.247 is non-significant, p=0.82; the ANOVA test is significant: F (3, 382) = 8.431, p <0.001. The multiple comparisons in post-hoc tests shows that the mean score of stress in group 1 (M=3.90, SD=1.15) is significantly different from those of group 3 (M=3.41, SD=1.31) and group 4 (M=3.08, SD=1.35), while that of group 2 (M=3.65, SD=1.08) is significantly different from that of group 4. The stress level decreases with more years of experience in cancer nursing.

There is a statistically significant difference in Job Satisfaction (p<0.01) for the four groups of categories in years as cancer nurses: F (3, 384) = 12.10, p<0.001 (Table 11). The Tukey HSD test in the Post-hoc comparison (Table 12) showed that the job satisfaction mean for group 1 (M=3.52, SD=0.502) was significantly different from the other three groups; group 2: (M=3.31, SD=0.464), group 3: (M=3.17, SD=0.521) and group 4: (M=3.16, SD=0.535). Nevertheless, there is no significant difference between groups 2, 3 and 4. Nurses who work for longer in cancer nursing have less job satisfaction.

Table 11. ANOVA Test – Stress, Job Satisfaction and Years of Experience in Cancer Nursing

	ANOVA						
	Levene (significant)	statistic df (Between, Within)	F	*p*	N	Mean	SD
Stress	2.247 (0.082)	3, 382	8.431	<0.001			
Group1					94	3.901	1.150
Group2					46	3.649	1.078
Group3					104	3.406	1.309
Group4					142	3.080	1.358
Job Satisfaction							
Group1	0.080 (0.565)	3, 384	12.102	<0.001	98	3.520	.502
Group2					48	3.130	.464
Group3					99	3.170	.521
Group4					143	3.160	.535

Group Number: **1**=<1 or =1 year; **2**=>1 or =2 years; **3**=>2 or =5 years; **4**=>5 years

Table 12. Multiple Comparison by Tukey HSD in ANOVA Test – Stress, Job Satisfaction and Years of Experience in Cancer Nursing

Multiple Comparison by Tukey HSD			
	Group Number	Mean Difference	*p*
Stress	1-4	0.495	0.032
Group1	1-5	0.821	<0.001
Group2	2-5	0.569	0.042
Group3			
Group4			
Job Satisfaction	1-2	0.393	<0.001
Group1	1-3	0.348	<0.001
Group2	1-4	0.360	<0.001
Group3			
Group4			

Group Number: **1**=<1 or =1 year; **2**=>1 or =2 years; **3**=>2 or =5 years; **4**=>5 years

Relationship between Stress, Job Satisfaction and Other Demographic Data

Pearson's correlation is used when exploring the strength of the relationship between two continuous variables. Pearson's correlation coefficient (*r*) ranges from -1 to +1; a positive r indicates that one variable increases when the other variable increases, this is called a positive correlation. On the contrary, a negative correlation demonstrates that one variable decreases when the other variable increases. The *r* can be 0 which means there is no relationship between the continuous variables. Standard values for interpreting the strength of correlation suggested by Cohen (1988, p. 79-81; cited in Pallant, 2007, p.132) are used broadly in all kinds of research: when r=0.10 to 0.29, it indicates a small correlation; when r=0.30 to 0.49 the correlation is medium; while with r=0.50 to 1.0 a strong correlation can be defined.

Although the relationship between stress and years of experience in cancer nursing was examined in ANOVA for comparisons among different groups, the correlation test here aims simply to describe the strength and direction. From Table 13, there is a small, negative relationship between stress and years of experience in cancer nursing, r=-0.285, n=409, p<0.001. The relationship between stress level and age is significant (p<0.001), negative (r=-0.298) and small. In other words, older nurses have less work stress, but age only has a slight influence on stress.

Table 13. Correlation Analysis – Stress and Years of Experience in Cancer Nursing and Age

Stress	Pearson's *r*	*p*
Years of experience in cancer nursing	-0.285	<0.001
Age	-0.298	<0.001

There is a significantly negative but small correlation between nurses' job satisfaction and their years of experience in cancer nursing, r = -0.115, p=0.023 (<0.05) in Table 14 Nurses' ages are significantly negatively but only slightly correlated with their job satisfaction, r = -0.152, p= 0.003 (<0.01).

Table 14. Correlation Analysis – Job Satisfaction and Years of Experience in Cancer Nursing and Age

Job Satisfaction	Pearson's *r*	*p*
Years of experience in cancer nursing	-0.115	0.023
Age	-0.152	0.003

Next, the dichotomous survey data are compared on the basis of stress and job satisfaction (Tables 15 & 16).

First, the results of a t-test with stress and the dichotomous factors are illustrated. Hospitals are divided into two groups, private and public. From Table 15, it can be seen that there is no significant difference in the stress score between private hospital nurses, nurses who have family members working in nursing and those who do not , nurses who have family members with cancer or not, and nurses who have completed the cancer nursing module in school and those who have not. However, the stress level of nurses who completed the oncology nursing training (M=3.17, SD=1.42) is significantly lower than that of nurses who did not attend the training (M=3.64, SD=1.16); t (319) =-3.42, p value=0.01, mean difference=-0.46. Meanwhile, nurses who have oncology nurse licences present lower levels of stress (M=3.17, SD=1.42), than those without licences (M=3.17, SD=1.42). This difference, -0.57, is significant t (160) = -3.68, p<0.001.

Next, how these factors have an impact on job satisfaction is demonstrated in Table 16. The only significant difference is that, nurses who work in private hospitals have higher job satisfaction (M=3.38, SD=0.521), than those who work in public hospitals (M=3.12, SD=0.519), with a difference mean = – 0.26 with t (388) = 4.899, and p<0.001. There is no significant difference in job satisfaction between cancer nurses who have family members working in nursing and those who do not, and between those who have family members with cancer and those who have not.

Table 15. T Test – Stress and Other Demographic Data

	Group	N	Mean	SD	t	df	*p*
Stress							
Attributes of hospitals	Private	198	3.306	1.307	-1.936	386	0.054
	Public	190	3.561	1.285			
Have nurses in family	Yes	147	3.280	1.329	-1.760	0.384	0.079
	No	239	3.518	1.266			
Have Family Members with Cancer	Yes	240	3.474	1.343	0.941	0.383	0.347
	No	145	3.346	1.212			
Complete the Module of Cancer Nursing in School	Yes	267	3.396	1.278	-0.692	387	0.489
	No	116	3.495	1.310			
Complete the Oncology Nursing Training	Yes	168	3.174	1.420	-3.422	319	**0.001**
	No	219	3.635	1.164			
Have License of Oncology Nurse	Yes	101	3.012	1.385	-3.811	384	**<0.001**
	No	285	3.587	1.239			

Significant *p* values are presented in bold

Table 16. T Test – Job Satisfaction and Other Demographic Data

	Group	N	Mean	SD	t	df	*p*
Job Satisfaction							
Attributes of hospitals	Private	203	3.380	0.521	4.899	388	**<0.001**
	Public	187	3.120	0.519			
Have nurses in family	Yes	151	3.275	0.550	0.589	386	0.556
	No	237	3.242	0.525			
Have Family Members with Cancer	Yes	242	3.252	0.521	-0.188	385	0.851
	No	145	3.262	0.558			
Complete the Module of Cancer Nursing in School	Yes	269	3.249	0.532	-0.420	383	0.675
	No	116	3.274	0.538			
Complete the Oncology Nursing Training	Yes	169	3.198	0.534	-1.638	385	0.102
	No	218	3.287	0.533			
Have License of Oncology Nurse	Yes	102	3.225	0.502	-0.584	385	0.560
	No	285	3.261	0.548			

Significant *p* values are presented in bold

4.6 Competing Models

Path analysis was conducted in Structure Equation Modelling using AMOS 20; to explore the best fit dynamic model among all possible compositions. Six models are displayed below, and model fit indices are used to select the best fitting model. The most accepted model fit indices used include Chi-square ($\chi 2$), degrees of freedom (df), probability (*p* value), RMSEA (Root Mean Square Residual), SRMR (Standardised Root Mean Square Residual), GFI (Goodness of Fit Index), AGFI (Adjusted-Goodness-of-Fit Index), NFI (Normed-Fit Index), RFI (Relative Fit Index), IFI (Incremental Fit Index), TLI (Tucker-Lewis Index), CFI (Comparative Fit Index), AIC (Akaike Information Criterion) and Hoelter's critical N. All of the reference values indicating good model fit are put in order in the second row of Table 17 Model Fit Indices.

The Chi-square, df and *p* value are used to detect badness of fit. The greater the Chi-square is, the poorer the fit of the sample data to the predicted model; in addition, if the *p* value is less than 0.05: it indicates a manifest difference between the sample covariance matrix and the implied covariance matrix which was produced from the predicted model. The RMSEA is a kind of badness of fit detector as well: the higher RMSEA shows that the predicted model does not fit with the observed data. When RMSEA is less than 0.05, it indicates very good model fit (Schumacker and Lomax, 2004); if it ranges from 0.05 to 0.08, the model fit is acceptable and good. The RMSEA is less influenced by sample size (Fan et al., 1999) and it is one of the principal indices in SEM (MacCallum et al., 1996). The SRMR is calculated on the basis of covariance residuals between observed and predicted models (Kline, 2011); when SRMR = 0, the observed model fits perfectly the predicted model. Smaller SRMR implies the better model fit; SRMR < 0.05 means that the model fits well while SRMR < 0.08 represents acceptable fit.

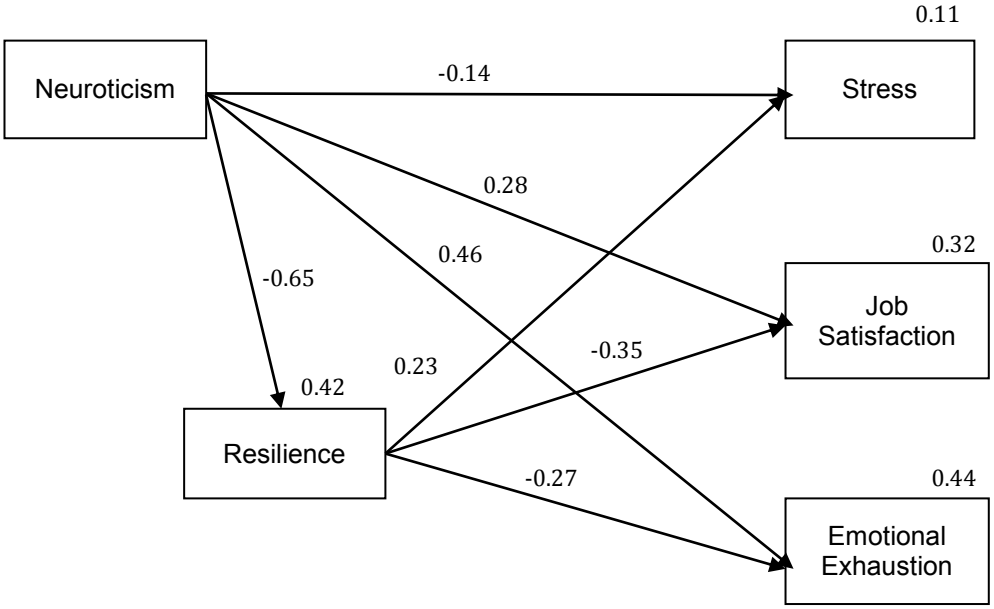
The GFI ranges from 0 to 1: closer it is to 1 indicates better model fit. GFI represents the ratio of sample model covariance that can be explained by assumed model covariance. The GFI is influenced by the df and sample size, it will be

underestimated if the df and sample size are small. Contrariwise, the AGFI takes the df into account, and >0.9 is acceptable while the closer to 1 the better. CFI, NFI, IFI and TLI belong to incremental fit indices; they are mainly used in comparing the Chi-square values of the observed model and the independent model. The independent model assumes that there is no correlation among all variables. When these four indices >0.9, it indicates that the observed model improves 90% of the Chi-square value compared with the independent model. The CFI and NFI range from 0 to 1; the CFI and IFI are less influenced by sample size (Fan et al., 1999); all of these four indices refer to good model fit when they > 0.9. In the case when NFI is < 0.9, the model may need to be reset (Schumacker and Lomax, 2004). Hoelter's critical N is used to justify if the sample size is appropriate; general speaking, the value of Hoelter's N lower than 75 is declined. The AIC has no standard value, the smaller AIC the better model fit; it usually used when competing models. Next, six predicted models are presented.

4.6.1 Predicted Model 1

Personality has direct effects on resilience, stress, job satisfaction and burnout. Resilience has direct effects on stress, job satisfaction and burnout. In addition, personality has indirect effects on stress, job satisfaction and burnout which are mediated by resilience. Personality is an exogenous variable, and stress, job satisfaction and burnout are endogenous variables; while resilience is both exogenous and endogenous. Each endogenous variable has its residual in error terms; the residual representing unexplained variance of the variable it heads in an arrow. Kline (2011, p. 105) stated that 'indirect effect involved one or more mediator variables, presumed to 'transmit' some of the causal effects of prior variables onto subsequent variables' (Figure 8). In the Neuroticism-Emotional Exhaustion Model (Figure 8), from the value on the right top side of each square, neuroticism is able to explain 11% variance of stress; 32% of job satisfaction; 44% of emotional exhaustion and 42% of resilience.

Figure 8. Model 1 Standardised Estimates



4.6.2 Predicted Model 2

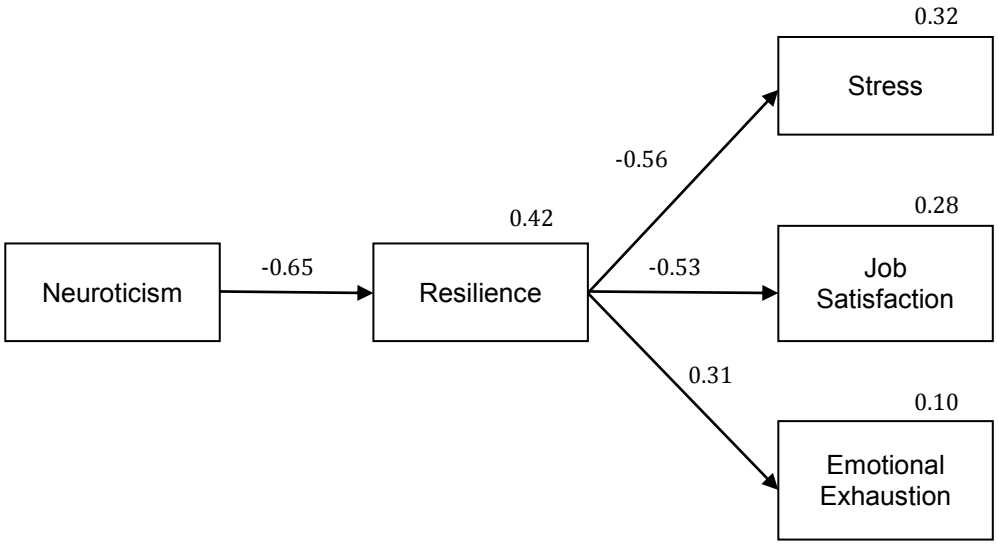
In Model 2 (Figure 9), personality is the exogenous variable and burnout is the endogenous variable. The other three variables are both exogenous and endogenous variables. As with model 1, personality influences resilience, stress, job satisfaction and burnout directly, and similarly resilience to influences stress, job satisfaction and burnout directly. Personality has several indirect effect paths in this model: it influences stress, job satisfaction and burnout indirectly through resilience; moreover, it has an indirect influence on burnout first through resilience then through stress or job satisfaction (ex. Personality → resilience → stress → burnout), or through stress and job satisfaction only (ex. Personality → stress → burnout).

Figure 9. Model 2 Standardised Estimates

4.6.3 Predicted Model 3

Model 3 (Figure 10) indicates that personality influences resilience directly, but only influences stress, job satisfaction and burnout indirectly through the mediator – resilience. Resilience as both exogenous and endogenous variables has direct effects on the three endogenous variables.

Figure 10. Model 3 Standardised Estimates



4.6.4 Predicted Model 4

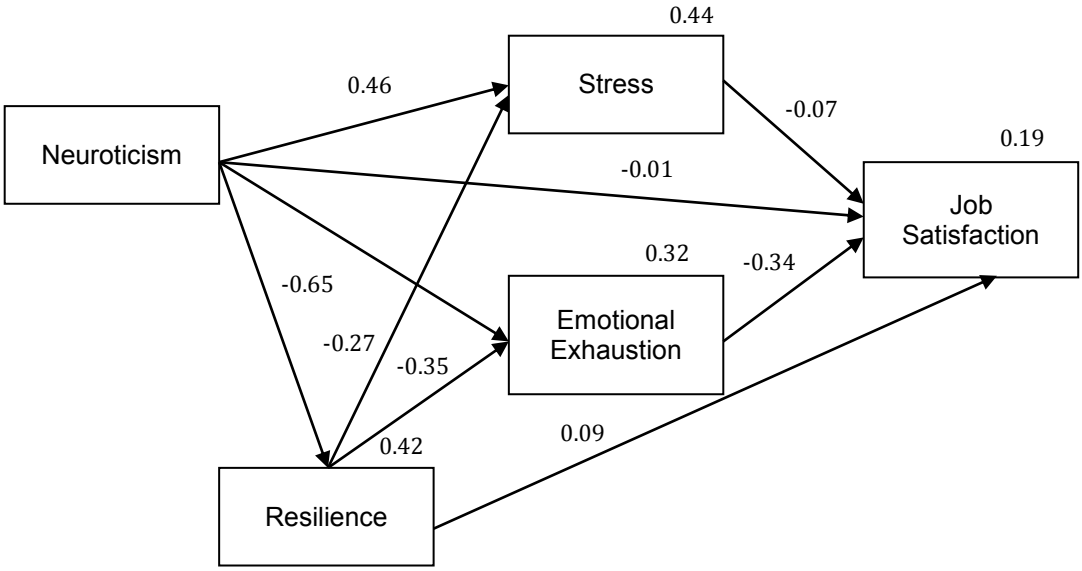
Model 4 (Figure 11) reflects the hypothesis that personality has a direct effect on resilience; resilience has direct influences on stress and job satisfaction; and burnout is influenced directly by stress and job satisfaction. Burnout is influenced by personality only indirectly through resilience before the stressful event, then through stress or job satisfaction after. Similar, resilience only influences burnout indirectly, with the two mediators - stress and job satisfaction.

Figure 11. Model 4 Standardised Estimates

4.6.5 Predicted Model 5

Model 5 is actually largely similar to model 2; the only difference is the exchange of job satisfaction and burnout (Figure 12).

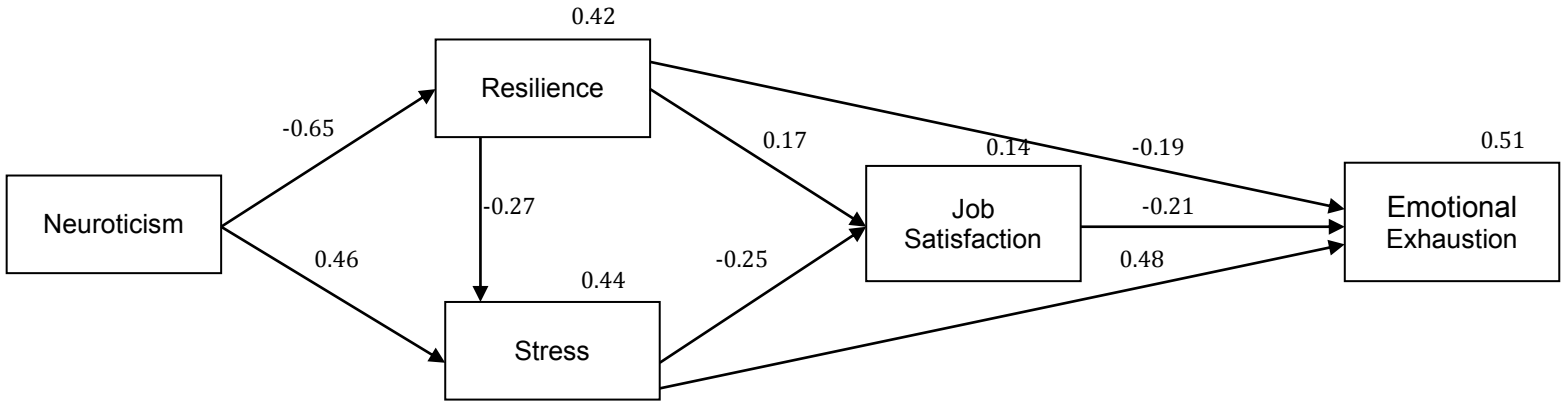
Figure 12. Model 5 Standardised Estimates



4.6.6 Predicted Model 6

Personality (neuroticism) is the only exogenous variable; resilience, stress, and job satisfaction are both exogenous and endogenous variables, whereas burnout is an endogenous variable. Resilience, stress and job satisfaction are mediator variables, which are associated with indirect effects from personality. Personality affects stress and job satisfaction both directly and indirectly; personality affects resilience first, and then resilience has effects on stress, job satisfaction and burnout. Personality has a direct effect on resilience, stress and job satisfaction, and only has indirect effects on burnout. There are three direct effects on burnout (exhaustion) from resilience, job satisfaction and stress, and other indirect effects from personality, resilience and stress through job satisfaction (Figure 13).

Figure 13. Model 6 Standardised Estimates



Determining the Best Fit Model

According to the comparison of various model fit indices in Table 17, model 6 is the best fit model: χ^2 (2), p = 0.719, RMSEA =0.000, SMRM = 0.000, GFI = 0.999, AGFI = 0.995, CFI = 1.000. This model is selected as the base model to calculate the strength of relationships between variables while taking into account all the supposed relationship inside the model. The strengths of relationships are displayed in the regression weights calculated in AMOS.

Table 17. Model Fit Indices of Competing Models

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Indicator	Good-fit						
χ^2	smaller	146.730	15.330	259.992	123.233	100.584	0.659
P(Probability level)	>0.05	.000	.000	.000	.000	.000	0.719
df		3	1	6	5	1	2
χ^2/df	1-3						
RMSEA	<0.05	0.342	0.187	0.321	0.240	0.493	0.000
SMRM	<0.08	0.1043	0.0383	0.1502	0.1120	0.782	0.000
GFI	>0.9	0.875	0.986	0.785	0.895	0.920	0.999
AGFI	>0.9	0.373	0.783	0.463	0.685	-0.201	0.995
NFI	>0.9	0.820	0.981	0.681	0.849	0.877	0.999
RFI	>0.9	0.401	0.812	0.469	0.698	-0.233	0.996
IFI	>0.9	0.823	0.982	0.686	0.854	0.878	1.002
TLI	>0.9	0.406	0.822	0.475	0.707	-0.235	1.008
CFI	>0.9	0.822	0.982	0.685	0.853	0.876	1.000
AIC	smaller	180.730	43.330	287.992	153.233	128.584	26.659
Hoelter	<75,poor	22	103	20	37	16	3727

The interrelationships of the variables of personality, resilience, stress, job satisfaction and burnout as presented model in Figure 11 are analysed. The paths of direct and in direct effects inside this model are listed as below, and diagrams which depicting the mediation in indirect effects are displayed follow the

description. In the diagrams, those arrows in bold indicate the indirect effects.

Direct effects

1) Neuroticism → Resilience

2) Neuroticism → Stress

3) Resilience → Stress

4) Resilience → Job Satisfaction

5) Resilience → Emotional Exhaustion

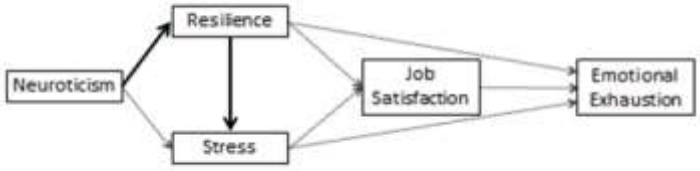
6) Stress → Job Satisfaction

7) Stress → Emotional Exhaustion

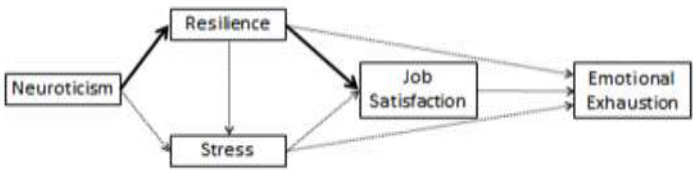
8) Job Satisfaction → Emotional Exhaustion

Indirect effects

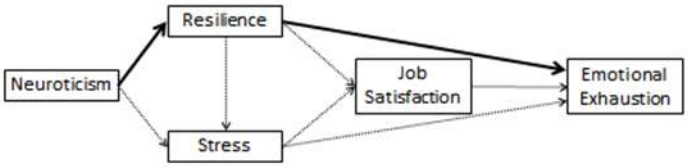
9) Neuroticism → Resilience → Stress



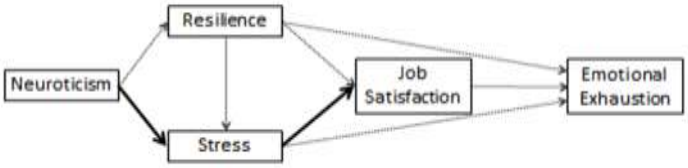
10) Neuroticism → Resilience → Job Satisfaction



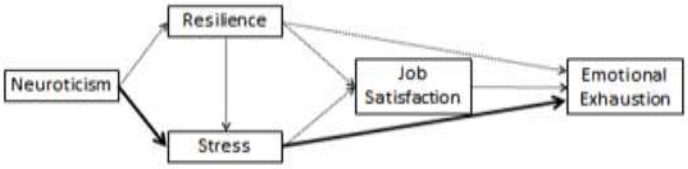
11) Neuroticism → Resilience → Emotional Exhaustion



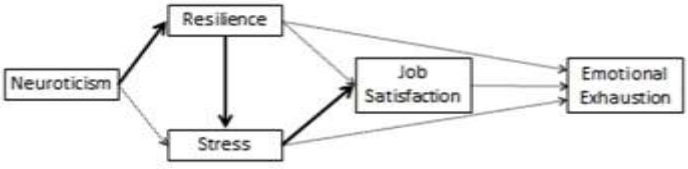
12) Neuroticism → Stress → Job Satisfaction



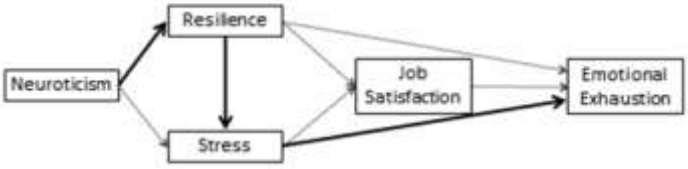
13) Neuroticism → Stress → Emotional Exhaustion



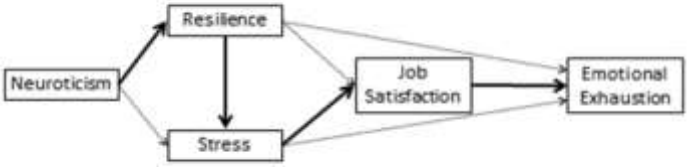
14) Neuroticism → Resilience → Stress → Job Satisfaction



15) Neuroticism → Resilience → Stress → Emotional Exhaustion



16) Neuroticism → Resilience → Stress → Job Satisfaction → Emotional Exhaustion



4.7 Relationships between Variables

4.7.1 Substituting Models

Model 6 as selected as the basic model for further analysis of 15 different components which are entered with five personality traits and three burnout factors. The 15 model components come from using five different personality traits to substitute as the exogenous variable; the three factors of burnout (emotional exhaustion, personal accomplishment and depersonalization) are substituted for the burnout variable. Directs and indirect effects are taken into account simultaneously. Those models with good model fit are selected to display the details of relationship among variables; important model fit indices are used for model selection, such as Chi-square, *p* value, RMSEA, GFI, AGFI and CFI.

Table 18 below, shows that there are 6 substituting models representing good model fit; those good fit models are shown in bold. The relationships between variables of good fit models are displayed individually. One reason for not displaying models without good fit is inside those models many path coefficients are not significant.

Table 18. Model Fit Indices of 15 Substituting Models

Component of Model/ Model Fit Index	Chi-square	*p* value	RMSEA	GFI	AGFI	CFI
Good-fit Value of Model Fit Index	smaller	>0.05	<0.05	>0.9	>0.9	>0.9
Neuroticism-Emotional Exhaustion	**0.659**	**0.719**	**0.000**	**0.999**	**0.995**	**1.000**
Neuroticism-Personal Accomplishment	**0.182**	**0.913**	**0.000**	**1.000**	**0.999**	**1.000**
Neuroticism-Depersonalization	**3.396**	**0.183**	**0.041**	**0.997**	**0.975**	**0.998**
Extraversion-Emotional Exhaustion	28.079	<0.001	0.178	0.974	0.806	0.957
Extraversion-Personal Accomplishment	35.907	<0.001	0.203	0.968	0.757	0.911
Extraversion-Depersonalization	34.071	<0.001	0.198	0.969	0.768	0.930
Openness to Experience-Emotional Exhaustion	**3.047**	**0.218**	**0.036**	**0.997**	**0.978**	**0.998**
Openness to Experience-Personal Accomplishment	34.908	<0.001	0.200	0.968	0.763	0.893
Openness to Experience-Depersonalization	15.979	<0.001	0.131	0.985	0.887	0.962
Agreeableness-Emotional Exhaustion	17.203	<0.001	0.136	0.984	0.879	0.972
Agreeableness-Personal Accomplishment	19.551	<0.001	0.146	0.982	0.863	0.942
Agreeableness-Depersonalization	55.930	<0.001	0.256	0.951	0.636	0.871
Conscientiousness-Emotional Exhaustion	**1.792**	**0.408**	**0.000**	**0.998**	**0.987**	**1.000**
Conscientiousness-Personal Accomplishment	48.835	<0.001	0.239	0.957	0.678	0.889
Conscientiousness-Depersonalization	**3.212**	**0.201**	**0.038**	**0.997**	**0.977**	**0.997**

The details of the Neuroticism-Emotional Exhaustion Model are described below as an example of how to interpret the outputs in AMOS. This model possesses good fit, the $X^2 = 0.659$, p = 0.719, RMSEA = 0.000, GFI = 0.999, AGFI = 0.995, CFI = 1.000.

Table 19 indicates the unstandardised regression weight, with the SE and *p* values in unstandardised calculation, followed by the standardised regression weight. The

standardised regression weights are equal to total effects. In maximum likelihood (ML) estimation, standard error (SE) and significance level (*p* value) are only shown with unstandardised regression weights, but each measurement has its own Likert-scale; therefore the significant level of individual unstandardised regression weight was checked. Then the strength of path coefficients are explained rely on standardised coefficients.

All parameters listed in Table 19 are significant. Some examples of the meanings of standardised regression weight estimates are explained here. First, for the direct effect of neuroticism on resilience, the standardised regression weight (β) is -0.647; this means that the neuroticism score increases by 1-point it can predict a 0.647-point decrease of resilience score. Also, the standardised regression weight of neuroticism on stress is 0.461; this demonstrates that one standard deviation above the mean of neuroticism predicts a 0.461 standard deviation increase in the stress level. Then, stress level also predicts emotional exhaustion in a positive direct effect with a 0.476 standardised regression weight.

Table 19. Maximum Likelihood Estimate Regression Weights among Neuroticism, Resilience, Stress, Job Satisfaction and Emotional Exhaustion in the Neuroticism-Emotional Exhaustion Model

Parameter	Unstandardised	SE	*P*	Standardised
	Direct Effects			
Neuroticism → Resilience	-0.305	0.018	**	-0.647
Neuroticism → Stress	3.684	0.383	**	0.461
Resilience → Stress	-4.464	0.811	**	-0.266
Resilience → Job Satisfaction	0.481	0.155	*	0.172
Stress → Job Satisfaction	-0.042	0.009	**	-0.252
Resilience → Emotional Exhaustion	-0.579	0.126	**	-0.194
Stress → Emotional Exhaustion	0.085	0.008	**	0.476
Job Satisfaction → Emotional Exhaustion	-0.226	0.040	**	-0.212

*p<0.05; **p<0.01

Next, the standardised indirect effects and total effects among variables are examined to understand the mediation effects of resilience, stress and job satisfaction between neuroticism and emotional exhaustion, as well as the predictor role of neuroticism on emotional exhaustion. From the left side of Table 20, neuroticism has only indirect effects on emotional exhaustion through the mediators – resilience, stress and job satisfaction; the coefficient 0.484 states that an increase of 0.484 level of standard deviation in emotional exhaustion is predicted from every 1 standard deviation increase in neuroticism via its prior effects on the other three variables, or mediators. In terms of total effects on the right side of Table 20, those coefficients refer to the sum of direct and indirect effects in each parameter; the total effects 'quantify how much two cases that differ by one unit on X (predictor) are estimated to differ on Y (criterion)' (Hayes, 2013, p. 93). From Table 20, it may be seen that neuroticism has a negative total effect on resilience (β=-0.647) and positive effect on stress (β=0.633) directly, but on emotional exhaustion (β=0.484) indirectly and positively; as well as stress had a total effect on emotional exhaustion (β=0.529). Resilience has a negative total effect on emotional exhaustion (β=-0.371). In addition, the indirect effect from neuroticism on stress is increased 0.172 point through resilience; the total effect between neuroticism and stress becomes 0.633 when mediated by resilience.

By comparing the value of indirect and direct effects, the strength of mediation can be evaluated. If the indirect effect is greater than the direct effect, it means the mediators strongly mediate the predictor variable and the criterion variable; thus the mediators are considered valuable.

Table 20. Standardised Indirect Effects and Total Effects among Neuroticism, Resilience, Stress, Job Satisfaction and Emotional Exhaustion in the Neuroticism-Emotional Exhaustion Model

Indirect Effects		Total Effects	
Neuroticism → Stress	0.172	Neuroticism → Resilience	-0.647
Neuroticism → Job Satisfaction	-0.271	Neuroticism → Stress	0.633
Neuroticism → Emotional Exhaustion	0.484	Neuroticism → Job Satisfaction	-0.271
Resilience → Job Satisfaction	0.067	Neuroticism → Emotional Exhaustion	0.484
Resilience → Emotional Exhaustion	-0.177	Resilience → Stress	-0.266
Stress → Emotional Exhaustion	0.053	Resilience → Job Satisfaction	0.239
		Resilience → Emotional Exhaustion	-0.371
		Stress → Job Satisfaction	-0.252
		Stress → Emotional Exhaustion	0.529
		Job Satisfaction → Emotional Exhaustion	-0.212

In the Neuroticism-Emotional Exhaustion Model (Table 21), neuroticism is able to explain 50.9% variance of emotional exhaustion; 41.8% of resilience; 44.2% of stress but only 14.2% of job satisfaction.

Table 21. The Square Multiple Correlations of the Neuroticism-Emotional Exhaustion Model

Neuroticism	R^2
Resilience	0.418
Stress	0.442
Job Satisfaction	0.142
Emotional Exhaustion	0.509

R^2=Square Multiple Correlation

4.7.2 Check the Significance of Effects

To classify the mediation effects are partial or complete, boostrapping was conducted when doing path analysis. The number of bootstrap samples is set in 10000 with 95% confidential interval as Hayes's suggestion in book (2013). The significant values of standardised direct and indirect effects are checked by the bootstrapping; direct and indirect effects which are non-significant are displayed in Table 22.

Table 22. Non-significant direct and indirect effects in the 6 Good-fit Substituting Models

	Effect	*p*
Direct	Stress - Personal Accomplishment	0.053
	Resilience - Depersonalization	0.410
	Openness to Experience - Stress	0.534
Indirect	Openness to Experience - Job Satisfaction	0.052
	Openness to Experience - Emotional Exhaustion	0.068

4.7.3 The Correlations between Variables in the 6 Good-fit Substituting Models

One of the most important aims of this research is testing the magnitudes of relationships between variables. Table 23 shows correlations among variables. Strong correlations exist between neuroticism and resilience (r=-0.647), neuroticism and stress(r=0.633), resilience and stress (r=-0.564), resilience and emotional exhaustion (r=-0.529), stress and emotional exhaustion (r=0.659). Many medium-strong relationships are found, including conscientiousness and resilience (r=0.438), conscientiousness and stress (r=-0.420), conscientiousness and emotional exhaustion (r=-0.323), resilience and job satisfaction(r=0.314) and emotional exhaustion (r=-0.529) also depersonalization (r=-0.320), stress and job satisfaction (r=-0.349) and depersonalization (r=0.456), job satisfaction and emotional exhaustion (r=-0.439) and depersonalization (r=-0.406).

Table 23. The Correlation Matrix of Variables

	Neuroticism	Openness to Experience	Conscientiousness	Resilience	Stress	Job Satisfaction
Neuroticism	1.000	—	—			
Openness to Experience	—	1.000	—			
Conscientiousness	—	—	1.000			
Resilience	-0.647	0.149	0.438	1.000		
Stress	0.633	-0.059	-0.420	-0.564	1.000	
Satisfaction	-0.271	0.040	0.181	0.314	-0.349	1.000
Emotional Exhaustion	0.484	-0.065	-0.323	-0.529	0.659	-0.439
Personal Accomplishment	-0.214	—	—	0.259	-0.266	0.278
Depersonalization	0.316	—	-0.210	-0.320	0.456	-0.406

4.7.4 The Square Multiple Correlation of Variables in the 6 Good-fit Substituting Models

The best-fit model (Figure 14) displayed the path which best explained how personality has an impact on burnout considering the mediating effects through resilience, stress and job satisfaction; also, including multicollinearity among variables. By using SEM, the model also took the unexplained variances and statistical errors into account. In Table 24 below, the values of the square multiple correlations illustrate how much of the variance of endogenous variables can be explained by personality. Neuroticism explained all of the exogenous variables, especially resilience, stress and EE. The 50.9% variance of EE was explained by all three personalities; only 12% of the variance of PA was explained by neuroticism; and 27.9% of the variance of DP could be explained by neuroticism and conscientiousness. Stress could be explained by personality in the range from 31.9% (by Openness to experience) to 44.2% (Neuroticism).

Figure 14. Best-fit Model

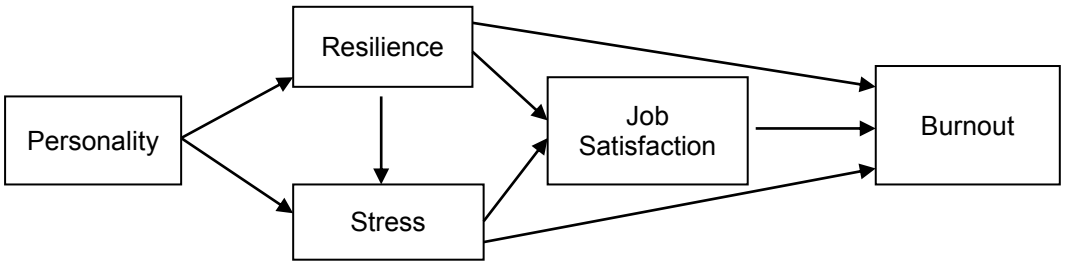


Table 24. The Square Multiple Correlations of the 6 Substituting Good-fit Models

R^2	Neuroticism	Openness to experience	Conscientiousness
Resilience	0.418	0.022	0.192
Stress	0.442	0.319	0.355
Job satisfaction	0.142	0.142	0.142
Emotional exhaustion	0.509	0.509	0.509
Personal accomplishment	0.120	—	—
Depersonalization	0.279	—	0.279

R^2=Square Multiple Correlation

4.7.5 Predictors of Intention to Stay in Current Job

To test the influence of nurses' personalities on their intention to stay in their current jobs as cancer nurses, another variable was entered – 'how long does nurse intend to stay in present job' (in the units of one year) in the 6 good fit models (as shown in Figure 15 below). From Table 25, the correlations between the three burnout factors and the years intended to stay are all significant but small. Personality traits can only explain quite small amount of variance of years intending to stay from 1.9% to 4%; personality traits relate weakly with intention to stay, the indirect effects ranging from 0.009 to 0.045 and -0.043 to -0.067.

Figure 15. Model 6 Including Years of Intending to Stay in Current Job

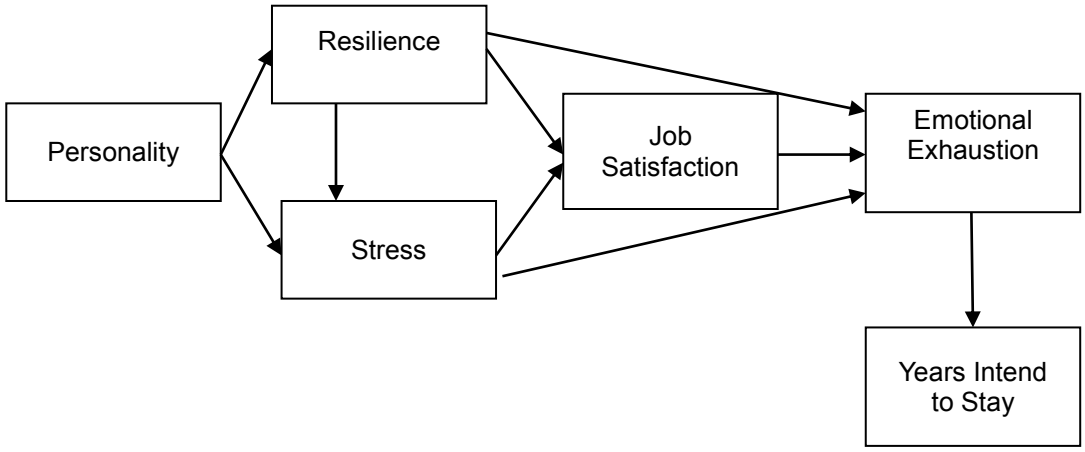


Table 25. The Influences of Personality and Burnout Factors on Years that Nurses' Intend to Stay in Current Job

Model	Unstandardised Direct Effect Burnout → Years to Stay	*p*	Standardised Direct Effect	R^2	Standardised Indirect Effect Personality → Years to Stay
Neuroticism → Emotional Exhaustion	-0.071	**	-0.139	0.019	-0.067
Neuroticism → Personal Accomplishment	0.152	**	0.201	0.040	-0.043
Neuroticism → Depersonalization	-0.140	**	-0.160	0.026	-0.051
Openness → Emotional Exhaustion	-0.071	**	-0.139	0.019	0.009
Conscientiousness → Emotional Exhaustion	-0.071	**	-0.139	0.019	0.045
Conscientiousness → Depersonalization	-0.140	**	-0.160	0.026	0.034

*p<0.05; **p<0.01

4.8 Discussion of Quantitative Results

This section discusses comparison of this study and previous research in two parts: 1) the correlations between demographic characteristics and stress, job satisfaction and burnout; 2) the current situation of stress, burnout and job satisfaction in cancer nurses. Further discussion of the best-fit model and the relationships presented in the model will be provided in the next chapter.

4.8.1 Demographic Characteristics and Cancer Nurses' Stress, Job Satisfaction and Burnout

The average age of nurses in the study was 28.7, which is relatively young compared with the Taiwan Union of Nurses Association (TUNA) (Anon, 2015) monthly report in 2015, where the distribution of the nurse population in ages 21-30, 31-40, 41-50 years old were 34.5%, 41% and 18.3%, respectively. This very young mean age may imply the high incidence of cancer nurses' turnover is in the early stages of their careers. In this study, older nurses had less stress and less job satisfaction than younger nurses. Being older may denote being more mature in mind and having a richer life experience, which may allow nurses to cope with stress, even from dilemmas when caring for patients. Therefore, retaining experienced nurses is important in offering better quality of care. Gillespie et al. (2009) also claimed that older and senior operating room nurses had slightly higher resilience which might explain the negative correlation between age and stress in this study. However, in this study, age had no correlation with resilience.

Only nurses with bachelor's degrees had lower stress level in this study. But the numbers of nurses with other education levels were too few; therefore this finding is hard to explain further. Additionally, no significant relationship was found between education level and job satisfaction. However, in Yin and Yang (2002) meta-analysis study in Taiwan, the findings indicated that higher educated nurses have lower work satisfaction.

No demographic data were found to be significantly related to cancer nurses' resilience; similarly, Gillespie et al. (2007) claimed, the age, years of experience, and educational level of that operating room nurses were not significantly associated with resilience. Nonetheless, a lack of congruence was reported by Gillespie et al. (2009): operating room nurses' age ($r=0.12$) and years of experience ($r=0.16$) were significantly but weakly related to resilience.

Position on the clinical ladder affected nurses' stress level negatively; this may mean that nurses who have qualified higher up the clinical ladders with longer tenure in cancer nursing are more competent in their work. This result indicated how important and necessary appropriate training is in stress management (Wu et al., 2010). In Hinds et al. (1990) study of developing an instrument for role-related stressors in paediatric oncology nurses, nurses with more than 5 years' work experience revealed lower stress levels. In other words, experienced nurses are valued as potential good models and appropriate mentors for new nurses in work stress management.

The oncology nursing training run by the Taiwan Oncology Nursing Society, which is especially offered to cancer nurses, significantly influenced nurses' stress negatively; and nurses who hold the licence of oncology showed less stress than those who do not. From the above, professional training courses in cancer care could make nurses more capable, thereby reducing nurses' stress at work (Gama et al., 2014). Completing the module on cancer nursing in school did not affect stress levels or job satisfaction in cancer nurses.

At the beginning of this study, it was assumed that nurses who have nurses in their family might show lower scores in stress and burnout, as their family may influence their perception of their work. In addition, nurses who have family members with cancer were also presumed to display less stress and burnout levels, because they may know the needs of cancer patients and their families and have more empathy to deal with patients' demands and suffering. However, no significant differences of the stress and burnout levels were found in these sorts of groups. However, the assumptions were supported in the interviews, where a few nurses indicated that they understood how hard of nursing could be and prepared themselves before started to work in hospitals; similarly, some nurses still represented their desire to treat patients as nicely as they could on account of the fact that they had accompanied their families through the tough times of cancer treatments.

4.8.2 Cancer Nurses' Stress, Burnout and Job Satisfaction Levels

The level of stress among cancer nurses was low to medium; that of emotional exhaustion (EE) was high; and those for personal accomplishment (PA), depersonalization (DP) and job satisfaction were moderate. Compared with paediatric oncology nurses groups, their stress levels were moderate (Bond, 1994; Hinds et al., 1998). Similar results were found in Australian cancer nurses for burnout (Barnard et al., 2006), where the burnout among nurses was low to moderate levels. In the study by Ksiazek et al. (2011), the burnout syndrome scores in surgery oncology nurses were 17.16 (Low) in EE, 6.5 (Moderate) in DP and 25.36 in PA (High); their work satisfaction score was 37.83 out of 70, which represents moderate satisfaction. Overall, cancer nurses had moderate levels of stress and job satisfaction, whereas their burnout expressed diverse outcomes in EE, PA and DP. The inconsistency in burnout figures may result from different hospitals, resources available, countries and work content (like surgery oncology and paediatric oncology). However, in this study, EE was particularly high; this may illustrate the heavy psychological demands of cancer nursing, and insufficient of support, resources and effective administrative management in Taiwanese cancer nurses.

4.9 Results of interviews

Following the quantitative results, this section will display the qualitative results by content analysis. Thirty-five nurses attended face-to-face interviews. Only three interviews were conducted in public places as the participants had requested this; others were held in individual rooms, without disturbance, for example meeting rooms or a head nurse's office. All the interviews were recorded in digital form and transcribed word by word. Transcriptions were saved in Word form and entered into NVivo10 for further content analysis. Only eight interviews were completed in two public hospitals; three from NTUH and five from TVGH respectively. Therefore all interview transcriptions from these two hospitals were enrolled.

The interviews were analysed in using the content analysis. Meaningful themes were searched for in the transcriptions; descriptions which reflected significant relationships in path analysis were sought. In addition, defined dimensions in the NEO Five Factor Inventory–3 (NEO-FFI-3), Nurse Stress Checklist (NSC), Maslach's Burnout Inventory–Human Service Survey (MBI-HSS) and Nurse's Job Satisfaction Scale (NJSS) were used as themes. For example, 'neuroticism' (in NEO-FFI-3), 'work concern' (in NSC), 'emotional exhaustion' (in MBI-HSS), and 'human relationship' (in NJSS). Other themes related to nurses' stress, job satisfaction, burnout and resilience but not included in the defined dimensions, and some themes related to reasons to turnover or stay were coded as well. The analysis process stopped when data saturation was reached. In the end, 25 interviews were analysed. The results and meaningful quotations will come next.

4.9.1 Personality

Interview participants were asked what sort of person they are, and what personalities they have. Most participants used brief adjectives to describe themselves. Following this, nurses were asked how their personalities influenced their work. The adjectives were categorised into five personality traits by referring to adjective check list items in the Manual of the Revised NEO Personality Inventory UK edition (Coast and McCare, 2006). The raw scores in each personality were re-coded into standard scores from 1 to 5, 1 meaning low presentation of that personality trait, 3 representing medium endorsement of certain personality that participants have, and 5 indicating high endorsement. Each personality trait will be illustrated by a few quotations to explain how nurses answered what sort of personality they have and what were their test scores in NEO-FFI-3 of the personality they described. The next section will present some quotations agreeing with the performances of each personality trait, the rest of the quotations which both agreeing and disagreeing with the representation can be found in Appendix 8.

People who score high on N (neuroticism) tend to be anxious, anger hostile, depressive, self-conscious, impulsive and vulnerable, and they may face stressful situations with flustered or upset reactions (Coast and McCare, 2006):

Case 5 (N=5)

'I'm a rash person, I'm a little impetuous. Oh, not a little, I should say quite impetuous. …quite rash…In terms of work, I'm rash especially at work; and yes, as well as in daily life. … I'm a free and easy person〔care little about little things〕, and relatively boorish.'

Case 11 (N=5)

'My characteristic … probably impatient, and when I was pressing I lost my temper more easily…and irritable.'

Case 30 (N=5)

'I feel I'm emotional and sensitive. … I am self-abased, precisely; I don't have confidence in myself.'

Individuals who score high in E (extraversion) present characteristics like warmth, gregariousness, assertiveness, activity, excitement-seeking and positive emotions; they are usually friendly, happy, upbeat, energetic and optimistic and prefer gathering as large groups (Coast and McCare, 2006):

Case 5 (E=5)

'I'm free and easy, and relatively boorish. … People say that I am noisy, I am annoying and talkative. Something like that, I think I am a happy-go-lucky person (optimist). I don't like to think pessimistic things. I think it's useless to think too much.'

Case 14 (E=4)

'Passionate …And I have my own thoughts…But not always the same as what others think… Yes, and want to make some changes.'

Case 29 (E=5)

'I'm very optimistic…. I'm a very positive person. … I'm the kind of person that has no big worry. I often think there is nothing I can't overcome in my life….I'm enthusiastic and full of energy.'

Case 31 (E=5)

'I make friend quite easily.'

People scoring high in O (openness to experience) tend to be active in imagination, sensitive to aesthetics, curious about the inner and outer worlds, aware of their feelings, keen on experiencing variety, quick to accept, and even implement, novel ideas and unconventional values. Therefore, they may experience more negative and positive emotions than less open people and are willing to challenge authority (Coast and McCare, 2006):

Case 14 (O=5)

'Passionate …And I have my own thoughts…But not always the same as what others think… Yes and~ want to make some changes.'

Case 22 (O=5)

'I'm brave to attempt.'

Case 30 (O=5)

'Sometimes I feel I am an enterprising person, um…I I push myself to go forward often, and I'm afraid to be a person who does not progress at all.'

Individuals with higher A (agreeableness) score are altruistic, tender-minded, modest, sympathetic and willing to help others; they are more popular with other people. Agreeable people tend to trust others and be straightforward which means frank, sincere and ingenuous; they also show compliance in groups (Coast and McCare, 2006):

Case 1 (A=4)

'I am good in getting along with people … with friends, colleagues or senior nurses … relatively good.'

Case 15 (A=5)

'I am highly compliant. … I like to contact with people naturally…and help people.'

Case 30 (A=5)

'I tend to sacrifice myself for others. … I care other people's thoughts and tend to

accommodate myself for others.'

Individual with the high conscientiousness scores show competency, dutifulness, and strive for achievement and self-discipline. Conscientious people usually have higher self-control and good at organizing; in the meanwhile, they tend to be more purposeful and determined to carry out a task (Coast and McCare, 2006):

Case 12 (C=4)

'Sometimes I am captious of something. I want to do things throughly….I am a pretty conscientious person. I would do my best to complete patients' requests if I can.'

Case 22 (C=5)

'My personality in work…actually I am quite harsh. About my work duty … I would plan in advance, and then follow my plan. …I think a lot. … I'm very circumspect.'

Case 30 (C=5)

'I want myself to be a conscientious person. … Sometimes I feel I am an enterprising person…. I feel that sometimes I am harsh to myself.'

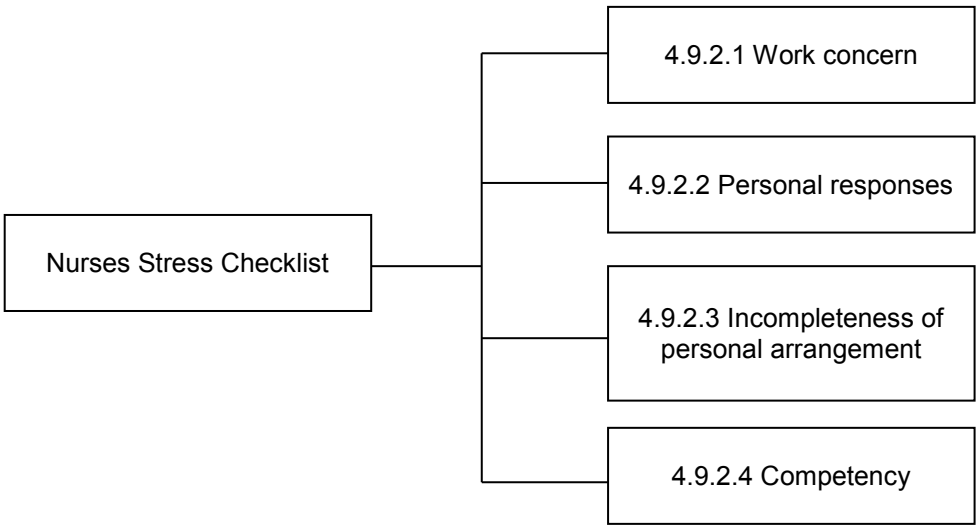
Case 35 (C=5)

'I'm conscientious about my work. … I will do my best to complete my director's order. … I'm aggressive to my work. … Compare to others, I am good at time control, and handle my scheduled progress well.'

4.9.2 Stress

The Nurse Stress Checklist (NSC) includes four dimensions (Figure 16): work concern; personal responses; incompleteness of personal arrangement; and competency. From the interviews, the matched themes and description are stated as follows. Although the quantitative questionnaire survey aimed to enquire about nurses stressful experiences within one recent week, the interview participants did not only describe late concerns but also the most impressive stressors they ever had.

Figure 16. Four dimensions in Nurse Stress Checklist



4.9.2.1 Stress-Work concern

The work concern dimension can be related to nurses' experiences recognised as stressful conditions in clinical work, comprising communication problems with physicians and families in patient care (Benoliel et al., 1990; Tsai, 1993), and other difficulties of clinical work.

Communication difficulties with physicians or nursing practitioners mostly happened when nurses had different point of view or conflicts related to treatment decisions. Nurses suffered from this stressor severely especially when the decisions affected patients' lives. Sometimes, nurses felt hurt if physicians did not value their reports or judgments of patients' critical situation: (Other quotations are in Appendix 9 section a-1)

Case 27

'When I can't communicate with physicians or NP〔= nursing practitioners〕or even head nurse, I feel exhausted…they didn't even believe you … or didn't accept your thought and opinion… and NP also thought our concerns were unnecessary……but we sometimes may encounter more situations and we are just beside patients…if the patients are safe, we can forget it…but most of the time we were right…then we feel miserable and grieved…we stand in the front line…and our position is low…so our opinions were hard to be accepted…at that moment, we felt the patients were so pitiful.'

Case 35

'communication with physicians or nursing practitioners ... sometimes you felt this patient needed to be dealt with, but when you reported to them, they might decide to observe only. At the moment, you could report, but you couldn't decide to do something to help the patient ... would feel stressful. You really want to do something.'

Another stressful circumstance occurred if the residents or young physicians had limited experiences in dealing with patients in a critical status, and also where the residents did not explain the patients' situations thoroughly to the patients or families:

Case 2 (Work Concern=4, Stress=4.45)

'when patients are in a bad status...some residents may not have experiences in dealing with patients, this made us feel very stressful...or when they gave orders which were different from what we usually did...what we should do...this also 〔caused stress〕⋯ the residents 〔or physicians〕did not explain very clearly to patients⋯ made the patients feel they still had hope⋯but actually, they were in the terminal stage, but their families still hold a lot of expectation. This is also a kind of stress in our care.'

Sometimes communication problems happened between nurses and supervisor or colleagues. An unfair attitude or decision from a supervisor, might cause stress to nurses. Usually, conflict happened between nurses and colleagues resulting from diverse opinions of how to deal with patients' conditions: (Other quotations arein Appendix 9 section a-2)

Case 34

'I feel the head nurse has her own favourites. I don't know her mood was up or down sometimes. Recently, I found that if she was off duty, I felt a bit easier in working. I felt tense if she was in the ward; because I didn't know if I did so, she would condemn me or not. Besides, the same thing resulted in different outcomes in different members; so you would know precisely that she has her favourites.'

Communication difficulties with patients or families such as telling patients they were in a terminal stage, how to face death or that cancer had recurred. Successful communication with clear messages and patients' or families clear understanding needs to be bases on good nurse-patient relationships and speaking skills; nurses also have to be aware of patients' and families' responses when they delivering such bad information. How to deal with patients' and families agitated responses

requires nurses' judgments, skills and experiences: (Other quotations may be found in Appendix 9 section a-3)

Case 28

'Difficulties happened when contacting with patients…when touching their mental aspect…this is the part that I need more effort to overcome…if only to help patients to deal with physical uncomfortableness, I feel that's fine…but except their physical uncomfortableness, is their willingness to sharing themselves…this part is not simple. Besides, sometimes we don't have enough time to sit and talk to patients…and sometimes patients were defensive when they were first admitted…and sometimes I feel my communication skills are not good, so I don't know how to touch this area…and this especially difficult to me when I was a new nurse.'

In addition to patients, sometimes communication with families is a stressor to nurses. In Taiwan, visiting time is not restricted; most families accompany patients 24 hours. Therefore, nurses need to be aware of their own behaviour and manner of speaking, and requests from families are numerous and sometimes awkward: (Other quotations can be found in Appendix 9 section a-4)

Case 30

'Families may choose what they want to hear…I feel I can't accept this. Or in some occasion, I didn't have fault but they blamed me.'

Case 15

'When they〔patients and families〕were in hospital, they thought they had severe disease. 〔They requested〕not only concerns for patients but also for families…the internet is too easy to access, so patients and families may obtain various information from internet and we have to respond to all kinds of questions. I feel this is over the range of medical treatment; it's more like service industry.'

When the treatment outcomes were bad, or when caring for patients in terminal stages, although physicians and nurses tried their best to clarify and explain the conditions, sometimes patients and families were not able to understand thoroughly or they denied the true conditions. This caused nurses stress. It resulted from patients' or families' agitated reaction if they finally recognised the condition. In some cases, patients and families thought that physicians had abandoned them by virtue of declarations of that there is no further active treatment or palliative treatment: (Other quotations in Appendix 9 section b-1)

Case 2

'Some families or patients might not accept their conditions; actually there is nothing we can do anymore. For us, it's a kind of stress.'

Case 33

'He 〔the patient〕 expressed that he wants to be cured … he struggles all the time. However, no matter from the data or his condition, that's impossible. …He couldn't accept the message we transmitted...'

Psychological demands from cancer patients or their families were seen as stressors for nurses, for example, nervousness of newly diagnosed patients, anxiety of recurrence in patients, uncertainty in accepting a newly invented treatment protocol or drugs, and worries about how to deal with their personal problems. Some patients and families may feel uncomfortable discussing these issues with each other; therefore, nurses become perfect targets on which to pour out feelings. Not only because nurses may have their total trust, but also because they assume that nurses have seen other patients in the same situation and may have good or professional suggestions for them. When patients wanted to be heard, nurses sometimes felt stressed because they hoped they had enough time for patients to have intimate talks; but usually they were not able to: (Other quotations in Appendix 9 section b-2)

Case 32

'I think 〔the stress〕 mainly comes from families' emotion, and patients' … I feel mainly from psychological problems. Every time when we have fresh cases, they were nervous, and this made me feel more difficult to deal with their situation. Because every patient or family has not exactly the same response to face stress…and sometimes they transfer their emotion to nurses…sometimes they couldn't accept the results of treatment, or the patients didn't respond to chemotherapy…I had encountered pretty many families transfer 〔their emotional response〕 to nurses…I feel sometimes this caused stress and felt exhausted'

Work may be overloaded, so nurses feel chased by time, and physical and mental tiredness. Having to stay late beyond the end of the shift is a common situation in Taiwan. When nurses could not finish work on time, they also worried about causing an extra load for the next shift. A system of job responsibility is applied in nursing in Taiwan now; every shift has its tasks to complete. In addition, when

changing shift, usually there was chaos and nurses who were in night shifts had double or even more the number of patients they cared for; for that reason, they hoped not to leave tasks to the next shift. Not only for hospital accreditation, but also protection of medical staff; documentation is indispensable. Almost all hospitals apply computer systems for charts and nursing records; many evaluation sheets need to be completed every shift. Many nurses could only do their paper work on the computer after they had handed over their patients to the next shifts, both because they did not have enough time and they could be interrupted frequently: (Other quotations may be found in Appendix 9 section c)

Case 12

'I think the hardest part of work is…you want to do your best for patients, so relatively, you must leave your paper work to the last. I feel that is hard for me, because the computer system keeps changing.'

Case 23

'Nurses in day shifts usually got off from work late; the situation of delay from work is serious. …I think it's because nursing records, I feel. …Because I already spent all my mind and energy on caring for patients, but after I finished all my tasks I had to write 〔nursing records〕; I feel very tired.'

Patients' poor or critical conditions could cause both physical and mental stress on nurses. When dealing with critical patients, many emergency treatments have to be given; their workload increases suddenly. Nurses worried that their tasks were delayed and other patients were ignored; they felt stressed from the uncertainty about outcomes of the critical patients. Families also gave pressure to nurses by expressing their worries, anxiety, fear of losing the patient and sometimes doubts about physicians' treatment; because nurses remained at the bedside all the time. When nurses distrusted the residents or physicians who gave out inappropriate treatment orders for patients, the stress became greater. Additionally, insufficient facilities like lacking vital signs monitors bothered nurses. No matter whether junior or senior, when they were facing patients' critical situation, they felt stressed: (Other quotations are in Appendix 9 section d)

Case 33

'When I was really busy, I couldn't sit at all; even a sip of water I had to grab at time.

All of a sudden, patients' conditions turned for the worse…that's not in my expectation: I felt shock. Actually, most haematology patients were old patients…and unexpected sepsis or sudden loss of conscientious…It's like…in fact, the patients didn't know they were dying…I feel so bad and very stressful…or helpless.'

Case 34

'The patients' condition and you can't be wrong absolutely…because one error may mean one human life or being accused….Many physicians nowadays they only looked at data, they didn't look at patients. And I feel…the patient is short of breath now, but you tell me the data is good…is this useful? Should I go to bedside and tell the patient 'you shouldn't be short of breath'? You〔=the physicians〕don't deal with it well… you just give stat drugs〔a medical abbreviation for urgent or rush〕to stop the short of breath temporally, then it happens again. The families questioned me, the patient questioned me and nurses questioned me. But what can I do? The physicians sealed like this.'

When nurses made mistakes, they were afraid to repeat or make another mistake and this thought became a stressor. Nurses are not allowed to make mistakes in education or training processes and they aware of that their job performance is associated with human lives or influences patients' treatment outcome significantly: (Other quotations are in Appendix 9 section e)

Case 20

'In fact, I've been working for 8 years and I rarely made mistakes before. Then recently…recent months, I made two mistakes; I felt very stressful. I thought I was so careful; why did I still make mistakes? While I made mistakes I was a mentor of new nurses, I felt very stressful; that period of time I was suffering.'

Case 30

'I would feel everything we do; we are not allowed to make mistakes. If you make mistakes, the harm is irretrievable.'

4.9.2.2 Incompleteness of personal arrangements

The stress of incompleteness in personal arrangements appears in not being able to deal with trivial matters in private tasks (Benoliel et al., 1990; Tsai, 1993); this also reveals the imbalance of personal life and work. When nurses spend all their mental and physical efforts on work, they may find that they have no energy and mood to complete their plans, such as housework or leisure activities:

Case 11

'When I went home, I found that…Oh…it's really tired, super tired. I didn't want to do anything. In the past, I would try hard to do my laundry; now, I just sat and watched television. I don't want to move at all, anyway, I just hope…just want to rest.'

Case 6

'It would be very tough work…Originally you may be delighted to come to work, but till the fourth, fifth or sixth day, you are in a worse and worse mood, then… what you can do when you have a day off is sleeping.'

4.9.2.3 Personal responses

Personal reactions to stress involve emotional, physical and cognitive dimensions (Benoliel et al., 1990; Tsai, 1993); nurses' stress especially could be displayed by various physical discomfortable even illness. Nurses were depressed when they felt unable to help patients; they also gave themselves stress due to their strong sense of responsibility to patients. Insomnia is common in nurses; some nurses imputed it this to the stress of work, and some ascribed it to night shifts. Insomnia sometimes influences nurses' moods; they felt depressed when they did not sleep well: (Other quotations may be found in Appendix 9 section f)

Case 5

'I am seemingly okay… but in fact I can't sleep well at night. But bad sleeping just lasts a short time … then I seem to feel okay at work. I think there must be… a bit of pressure in my mind, resulting in bad sleeping. And I think of many things when I sleep at night.'

Some uncomfortable symptoms or syndromes might result from night shifts according to nurses' description. Some nurses indicated that they have somatic syndromes such as having sore or aching shoulders, back and low back, constipation, urinary tract infection, oedema of lower limbs, dizziness, headache or migraine. Sore shoulders and aching back are the most common somatic symptoms among nurses. Nurses especially indicated that night shifts may cause insomnia, social isolation, amenorrhea, and fatigue to nurses and influence their quality of life: (Other quotations are in Appendix 9 section g-1)

Case 1

'When I was in night shift, I felt my physical condition was bad; I really felt very tired. And I felt very sleepy when I should be conscious.'

Case 35

'I usually choose day shift, because my sleeping quality was bad when I was in night shift. Also,〔during the night shift〕 I couldn't company my family when I was off; I could sleep all day during vacation.'

Nurses have some personal mental responses, like feelings of conflict with colleagues, hopelessness in cancer patients, depression due to the loss of patients and being helpless to help patients. These mental responses may cause some somatic symptoms: (Other quotations may be seen in Appendix 9 section g-2)

Case 31

'In the beginning when I came to this ward, I felt …um…why everything I saw was so despair. And I somewhat couldn't adjust…then I felt why cancer was so terrible. Patients leave〔=died〕right away〔since patients had been diagnosed〕. Although I wouldn't be very upset when patient died, but I felt that I'm very easy…to think of patients continuously. Although I didn't bring my work to home easily, but in that moment I continued to think patients' conditions… I thought of I can do nothing for them…I felt a bit depression.'

4.9.2.4 Competency

Competency is how well nurses feel in their ability to do their work to a satisfactory level; this dimension contains the completion of nursing tasks and self-evaluation of fulfilment in nursing roles (Benoliel et al., 1990; Tsai, 1993). Nurses feel stressed when they encounter situations they have never met before, and worry about whether they are able to deal with the situations or not: (Other quotations are in Appendix 9 section h)

Case 29

'Sometimes, the problems you accounted in clinical work that you never had before…you really don't know what to do to deal with it…'

Case 31

'I would say knowledge, for instance, if something happened to patient; especially what you never met before…physician might give some orders, but you never did this before and you don't know what these orders are for; then the stress came to you…because you didn't know what you should do.'

4.9.2.5 Other stress dimensions not included in Nurse Stress Checklist (NSC)

Other than those themes matched with the NSC, some themes found in the interview data also related to nurses' stress. Looking at patients suffering from pre-dying symptoms, receiving families' sadness or agitated emotional responses, helping patients and families to realise the coming of death made nurses feel stressed. On the other hand, nurses had to face their own heavy burden when they lost patients who had a good relationships with them: (Other quotations in Appendix 9 section i)

Case 12

'Those terminal patients, you need to talk to them about … about the things were going to happen, to let the patients know present situations and follow-up preparation; I feel this is a stress. Or letting families know what we can do is just like this〔few〕; more unnecessary treatments just cause pain. I feel all of these are stress, because I don't know how to speak out.'

Case 28

'The powerlessness was that you know the patients' progress; you know they were feeling pain. What we can do for them? Only endless pain killers. They looked very suffering. You feel so sorry for them.'

Case 35

'Some patients were young, when they expired I felt sadder. I felt they were so young but they had to face such disease.'

Working in cancer wards exposes nurses to a dangerous chemical environment. Nurses may worry those chemicals or substances were hazardous to their health:

Case 30

'Of course in this ward there are some risks, those are radiation, needle-stick injury, infections like TB 〔=Tuberculosis〕. Those are what I can endure; but except those,

litigations make me feel terrified. When I had numerous hair loss, I would think if I absorbed too much chemo drugs.'

Some stress is caused by lack of manpower; nurses have work overload and feel tired without sufficient manpower:

Case 3

'Off days become less recently … I feel tired. '

Case 32

'In the night shift in this ward, if the beds are not fully occupied, there is only one nurse. When I worked alone, I was afraid that an emergency would happen and I didn't know how to call help.'

More than half the nurses indicated that their stages as a new nurse were the most stressful time they had. Learning new knowledge related to cancer treatment, becoming skilled in all kinds of nursing techniques, judging the sudden change of patients' conditions, facing families, building relationships with colleagues, adjusting to a new work environment and night shifts, and severe delays of getting off work made new nurses think that they were not competent to be a cancer nurse; they were so stressed that they wanted to leave their jobs: (Other quotations may be found in Appendix 9 section j)

Case 6

'In the beginning when I did this job, the pressure came from being unfamiliar with many things. I mean inserting catheters or some technical operation. I was scared, I was worried … after three months I felt more pressure in shift exchange … suddenly, a lot of things happened simultaneously, I worried that I couldn't handle them and things couldn't be done, shift exchange was in a mass.'

Another stress came from working with new nurses. When the ward recruited several new nurses at the same time, senior nurses took responsibility to teach and supervise them when they first worked independently; this was an extra workload aside from their busy work. 〔In Taiwan, most new nurses are only covered by senior nurses for one month〕. Also, taking over patients〔shift exchange〕from new nurses made senior nurses feel stressed due to extra attention needed for

patients' conditions, any missing treatment and unreasonable orders. In addition, transferring shifts to more senior nurses made nurses to feel stressed. Senior nurses might question junior nurses' judgments with caustic attitude: (Other quotations are in Appendix 9 section k)

Case 23

'Taking over shift from new nurses but they didn't make patients' conditions clear to me. Then I had to force myself to take care of patients without knowing their business. My mood would be influenced and I had to clarify to myself of the raised problems.'

Paperwork is increasingly important. Patients' self-protection awareness is high: and complete documentation is one of the best methods to avoid medical disputes in the future. Therefore, numerous physical evaluation sheets have been developed and used for simplifying and replacing recording of details. When nurses were busy, they could only complete the sheets after transferring patients to the next shift; the paperwork was seen as an undesirable burden. Another burden is the various reports needed to move up the clinical ladder. For example, literature reviews of disease, reading reports of new treatments or drugs, case reports and administration projects; some nurses detested writing those time-consuming and tedious reports. Additionally, the duty to attend different teams like nursing skill audit team and administration project team is bothersome:

Case 12

'I think the hardest part of work is you want to do your best for patients, relatively you have to keep your documentation work to the last. Also, the computer system keeps changing. This is the harder part of my work.'

Case 22

'There are many teams in the ward or nursing department, such as education team. You must join some teams because of the system regulations. It would be a stress. For me, I hope nursing is a simple work rather than added so many additional works. You have to sacrifice your own vacation or time to attend the various teams. Of course you know all of these will benefit nursing development, but sometimes you just don't want to manage with them.'

Hospital accreditations are held regularly in Taiwan by the Ministry of Health and Welfare, including teaching accreditation, hospice care accreditation, cancer care

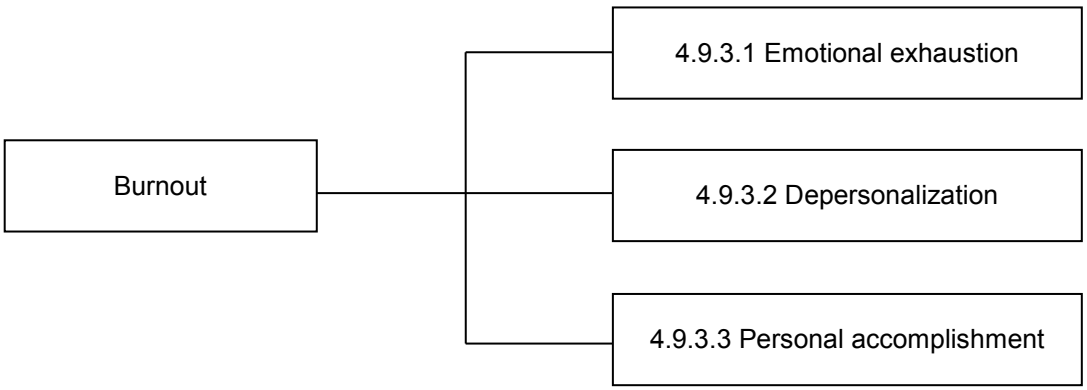
accreditation and total accreditation etc. at separate times. The accreditation results influence the payment for treatments from national health insurance, the number of interns or residents that can be recruited every year, how many beds can be placed and so on. Before the accreditations, all departments need to prepare documents in advance and improve the routine work to match the accreditation standards. In addition, during the accreditation, the surveyors can visit the hospital anywhere at any time. Those preparation works and surveyors' monitoring are seen as workload extra over the daily work, especially for senior nurses and leaders; who share the responsibility of administration mission from head nurses:

> ***Case 35***
>
> *'JCIA accreditation… 〔before the accreditation〕 we will have some continuous education‥there are some lectures to help us to review the accreditation 〔standards and measurement elements〕.*

4.9.3 Burnout

Nurses' work experiences associated with job burnout were categorised onto three composite dimensions (Figure 17): emotional exhaustion; depersonalization; and personal accomplishment. Personal accomplishment has a negative contribution to job burnout, which means higher personal accomplishment scores indicating lower burnout. The sums of raw score for each dimension were converted to a standard score from 1 to 3; 1 referred to low, 2 meant moderate and 3 indicated high level of burnout. The raw scores of personal accomplishment were reversed before calculating the sum, therefore the same judgment criteria were used for the standard scores.

Figure 17. Three Dimensions in Burnout



4.9.3.1 Burnout-Emotional Exhaustion

Emotional exhaustion is the most obvious form of expression of burnout, and it is referred to almost every time that people describe the occurrence of burnout (Maslach et al., 2001). It simply reflects how people recognise stress in work and their emotional response.

When a continuous working shift is too long, but nurses had insufficient rest before the next shift; this causes physical fatigue and mental tiredness: (Other quotations were put in Appendix 10 section a)

> ***Case 6***
>
> *'Physically tired, sometimes mentally tired as well. It would be very tough work…Originally you may be delighted to come to work, but till the fourth, fifth or sixth day, you are in a worse and worse mood, then … what you can do when you have a day off is sleeping…Yes… um… and…unwilling to go out on holidays, just want to stay at home and sleep, that's all. I wasn't in the mood to go out.'*

Nurses wanted to run away from work when they were exhausted, but they still needed to force themselves to focus on work and faced patients and families in a good working status with their best efforts: (Other quotations were put in Appendix 10 section b)

Case 20 (Emotional Exhaustion=3)

'That kind of pressure is ... while I go to work every day, I think is that possible not go to work? In fact, I rarely feel I don't want to work. But during that time period, I denied to go to work every day. I felt … oh … it's a big stress.'

Sometimes, nurses were affected by patients' and families emotional reactions, such as when the patients were newly diagnosed or had ineffective chemotherapies, sometimes they transferred their stress to nurses' by showing bad manners or blaming nurses. Usually, nurses can see a more realistic point of view and feelings proposed by patients and families, because patients and families are afraid to offend physicians. Nurses mostly hided their grievances; they thought dealing with patients' and families' moody responses and giving support were priority: (Other quotations were put in Appendix 10 section c)

Case 32 (Emotional Exhaustion=1)

'I feel patients' mood is my responsibility; it's possible because of this thought, I feel I can't deal with … when patients were unhappy and blamed me about the medical treatment, I felt very … powerless.'

4.9.3.2 Burnout-Depersonalization

Depersonalization happens when nurses attempt to keep a distance from patients with the purpose of less engagement in patient care; nurses may feel it easier to deal with work demands when they see patients as impersonal objectives (Maslach et al., 2001).

Depersonalization happened especially when nurses had good relationship with patients but had to look them die or suffering, moreover, some nurses considered patients as their friends. To cope with the unbearable feelings of sadness and lost patients, some nurses choose to be depersonalised as a coping strategy and avoid themselves being hurt: (Other quotations were put in Appendix 10 section d)

Case 11 (Depersonalization =3)

'We can talk about patients' death in easy attitude, it's like we take death as nothing … but I feel people shouldn't be so hard-hearted … I wouldn't be so unfeeling before, but I would now.'

Case 19 (Depersonalization =2)

'from this event〔to be a good friend with patient and patient dead〕, it caused negative impact in my mind. I became fearing of opening my heart to patients, such deep just like friends; and I devote more affection to patients. This makes me more and more frightened, because I dread to lose more. So … in the very beginning … I choose to maintain the pure nurse-patient relationship.'

4.9.3.3 Burnout-Personal Accomplishment

Nurses who are experiencing emotional exhaustion and depersonalization could diminish their work efficiency. People who consider themselves have low personal accomplishment may feel inefficient, demotivated and lack control of their work (Schaufeli et al., 1993).

Patients' approval by positive feedback of nurses' ability or efforts plays an important part in personal accomplishment. Nurses also obtain fulfilment from their job from some trivial things; for instance, patients going through anti-cancer treatment and being discharged smoothly, patients or family could remember their names, receiving appreciation from patients or families. Making patients understand their conditions and give appropriate education about self-care, predicting treatment side effects accurately and giving corresponding care based on professional knowledge, or helping patients and families to prepare for the end of lives made nurses build feeling of fulfilment. Further, nurses sought fulfilment by achieving some goals in their nursing career such as developing communication skills, upgrading in the clinical ladders, or becoming a role model for junior nurses. One special point is cancer nurses becoming families' and friends' consultants when they have cancer; nurses felt that they made a contribution and were helpful: (Other quotations were put in Appendix 10 section e)

Case 1 (Personal Accomplishment =2)

'Upgrade my clinical ladder. … and if I took care of the same patients often, every time the patients admitted to hospital knew who I am and talked to me … sometimes they brought me something〔such as fruit or food〕, or they just talked to me; I felt very happy because the patients remembered me.'

Case 33 (Personal Accomplishment =3)

When patients were at the point of death, I could interfere earlier and let them know they didn't have much time left; then they could consider clearly about their arrangements for families or last wishes. I felt I was fulfilled and very brave.'

Case 34 (Personal Accomplishment =2)

'Recently, my dad has been ill; and I felt fortunately I understand cancer, otherwise, my family would have no idea what to do. I feel I am useful in this situation. … When patients or families showed their approval to me, I felt fulfilled.'

4.9.4 Resilience

Resilience is an ability either for bouncing back to an original status under stress, or adapting to stressful circumstance for achieving new balance (Smith et al., 2008). Only one nurse indicated her effort to adjust at work; resilience is an important factor that has an impact on nurses' ability to deal with their stress and burnout. However, only one quotation was found:

Case 22 (Resilience: 3)

'In terms of personnel, between 〔me and〕 colleagues or supervisors, I had some emotional response. But I might become mature along with work, my mentality keeps changing. … In the past, I was impatient; if I saw any colleague work slowly or couldn't catch up my pace, I felt annoyed and very stressful. But I graduate adjust my pace, in fact, this could be improved.'

4.9.5 Themes reflecting significant relationships in questionnaire survey results

The purpose of conducting the interviews was to assess the significant relationships in demographic data, personality, resilience, stress, burnout and job satisfaction. This section is going to display the findings of interview analysis which reflected agreement or disagreement with significant findings in statistical analysis.

Hospital Attribution and Job Satisfaction

Nurses mentioned that they decided to stay in their hospitals because they identified the objectives or the visions of hospitals or the good work environments; this indicated the attributes of hospitals which may influence nurses' job satisfaction or their perception of their work: (Other quotations are in Appendix 11 section a)

Case 21 (Private cancer centre)

'In terms of nursing work, this hospital is a very good environment of cultivating; it emphasises human being. … It〔=the environment of this hospital〕is very similar to the feelings in my internship as teachers taught you how to interactive with patients and how to observe … this was what I first came into clinical work, the same. I heard from my classmates how they take care of patients; I feel why the difference is so huge. I think the medical environment in this hospital is the same as what I learnt in school.'

Case 34 (Public medical centre 2)

'In big hospital, it has SOP (standard operating procedure) in everything. You wouldn't feel why this person did in this way but the other did in other way; I feel this is better.'

Nurses who have family with cancer

Nurses with family members with cancer may have more sympathy and make more effort when they face cancer patients. This is reflected in their thoughts:

Case 1

'When patients felt pain or other uncomfortable, I would deal with their symptom first. Because when I took care of my uncle〔who was a cancer patient〕, I think he was really suffering; therefore, when I was caring for patients I would think of them.'

Case 30

'My grandparents both died of cancer; I was in senior high school then, and that's my first time to contact with cancer. They had been misdiagnosed; I checked a lot of books during the process of taking care of them. I would like to know how to make them feel better.'

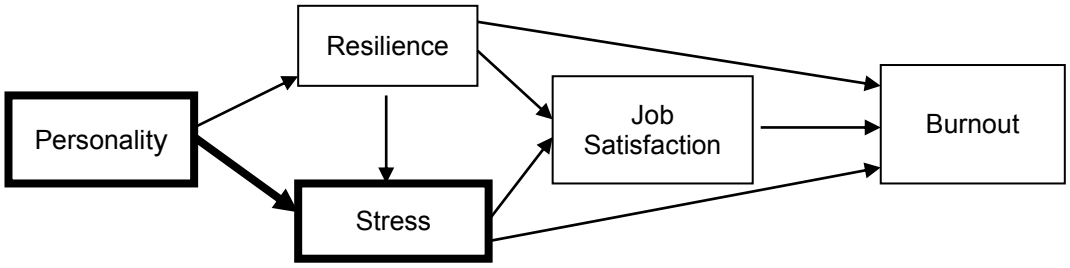
Nurses who have family as a nurse

Nurses may adjust their job better or know the nature of nursing well from their family who are nurses:

> ***Case 33***
>
> *'My mother is a nurse too, so when I studied in nursing school, she had already told me that nursing would be a hard path. So, I felt that I had already prepared myself to this.'*

Personality and Stress

Figure 18. The relationship between personality and stress in interview



Neuroticism

Participants mentioned how their personality influenced their work processes or performance. Neuroticism is positively correlated with stress and burnout; one nurse demonstrated that her neurotic behaviours in working influenced her colleagues as well. Nevertheless, nurses' neuroticism sometimes helps them to confront this sustained intense work: (Other quotations can be found in Appendix 11 section b)

> ***Case 5***
>
> *'I think it〔quick temper〕more or less helps me in my job. Because here … it's in fast-paced. The tempo is too fast; if you don't move fast, you may not catch up with others…. If I'm slowing moving and unable to get things done, my patients won't be happy, physicians won't be happy, and seniors won't be happy; because all of them have to share the additional work for you. So I think quick in action is helpful in terms of work.'*

Extraversion

Although extraversion did not have a significant impact on other factors in the model, one participant said how it helped her to establish good relationships while caring for patients:

Case 5

'You are happy at work. You are happy when your talk to your patients, so everyone is happy to see you.'

Case 15

'Extraversion can … if you like to laugh or are a good conversationalist, your interpersonal relationship with patients and family would be nice.'

Another instance was where a nurse indicated the characteristic of friendliness facilitating the establishment of relationships with patients and families:

Case14

'Because they won't be so unfamiliar or scared; and it's easy to get many things done. Usually it would be easier … to become part of them〔= patients and families〕, integrate into their current situation.'

Optimism is an adjective related to extraversion; it makes nurses face patients in a delighted attitude and patients might be influenced to be in a good mood:

Case29

'I feel my optimism reduced little bit of the〔patients'〕sadness.'

Case 16

'Some patients feel full of energy because they saw my optimism.'

Agreeableness

Although agreeableness did not have significant correlation with stress, burnout and job satisfaction, it was seen as quite useful in nursing work. Altruistic behaviours, tendency of trusting others, being generous and sympathetic were frequently identified in interviews:

Case 30

'I feel to be a good nurse must like this … in many occasions, such between me and colleagues or patients; there are some tasks to be complete, sometimes I would tend to sacrifice myself. Like delay my meal or time to get off, I must complete all tasks what I felt I must do. This is possibly the necessary characteristic of this job.'

Case 33

'I feel what patients said sometimes not equal to what they thought; there were other meanings behind their words. I can understand the hidden meanings, I think this is great.'

Openness to experience

The personality trait of openness to experience made nurses feel curious about new knowledge or questions and to be willingness to try unconventional or new actions; this helps nurses to learn new knowledge to solve clinical problems:

Case 5

'In the beginning I felt difficult. Afterwards…anyway I just kept learning … kept learning … till I couldn't go any further. But after I learned or after the tough time passed, um … things seemed to go smoothly. I think it is good…. 〔When I run into a situation〕 I'm still afraid of making mistakes, so I always ask first. After asking, then decide what to do. For uncertainty, always ask first.'

Conscientiousness

In the competency dimension of stress, conscientiousness was helpful in patient care. Conscientiousness makes nurses pay attention to tiny signs or change in patients' conditions; and by showing nurses' circumspection, patients feel easier in mind. In addition, conscientiousness was recognised by many nurses as a crucial personality trait which enables nurses to be competent at their job, and makes them work efficiently: (Other quotations are in Appendix 11 section c)

Case 6

'On patients … or observe some subtle things.'

Case 23

'I think being circumspect is very important, sometimes patients can feel 〔the different from〕 your petty actions.'

Case 32

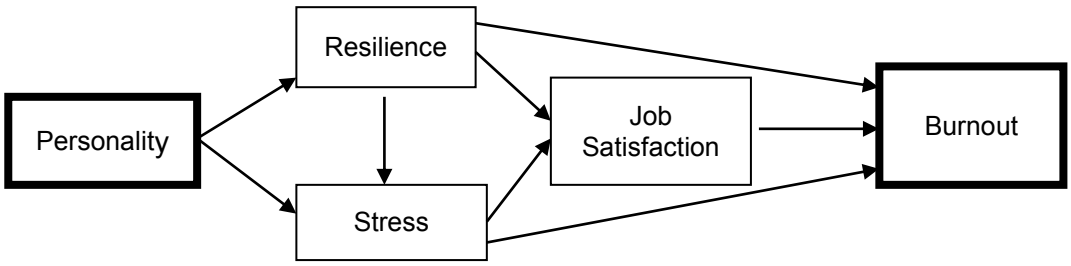
'I'm not easy to relax. But other characteristics I think are quite important, such as sharp observation, being circumspect, and I think pursuing perfection is good. Because you would persist in things that you think are right.'

Case 33

'Due to the complexity of nursing, although it's just measuring blood pressure or changing wound dressing; but actually I can finish my work quickly. It may be related to my clear-headed, I know what can be done later and what I should put in prior in the moment.'

Personality and Burnout

Figure 19. The relationship between personality and burnout in interview



Neuroticism and Emotional Exhaustion

Some nurses represented how their personality affected burnout in both good and bad ways. Higher neuroticism score can be related to a greater likelihood of susceptibility or vulnerability under stressful circumstances. One nurse wished that she could be less neurotic, then she may have been able to complete her work in more stable emotional state. Having less negative mood means a lower risk of

emotional exhaustion. This echoed the results that neuroticism is negatively related to emotional exhaustion:

Case 3

'Of course you can't be too relaxed to affect your work. But I feel if I can be relaxed and accommodate my negative mood, I may work more efficiently or I can do better.'

Extraversion/Agreeableness and Depersonalization

Extraversion and agreeableness were not significantly related to burnout, but nurses felt these two personality traits had a positive effect on the effort of showing concern and wanting to be helpful. This effect may reduce the incidence of depersonalization. More extravert nurses working with a pleasing attitude may be more popular to patients and families because nurses' attitude affected their feelings and mood. In addition, nurses thought their extraversion also functioned in supporting colleagues in such hard a working environment: (Other quotations were put in Appendix 11 section d)

Case 28 (Extraversion + agreeableness)

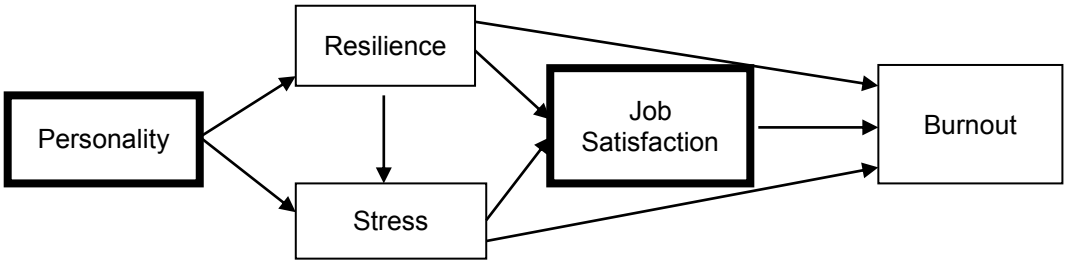
'I like to be close to people, this is a good effect 〔on my job〕. They 〔patients〕don't feel we are cold and just doing our job, and they don't think we don't care about them. That is you are willing to talk with them and give them a smile; or when the patients are uncomfortable you show your concerns to them actively. They may give you more feedback, and are more willing to trust us. When we are giving some nursing actions or patient education, they are easier to accept. This just needs one or two more concerns from you.'

Case1

'If you are more optimistic, that is to say sometimes we talk to patients joyfully … actually … patients like you to take care of them.'

Personality and Job Satisfaction

Figure 20. The relationship between personality and job satisfaction in interview



Nurses pointed out that extraversion and agreeableness influenced their relationships with colleagues in positive way:

Case 5

'I think it〔optimism〕is relatively helpful. Yes, because you are happy ... you are happy at work...everyone is happy to see you.'

Case 14

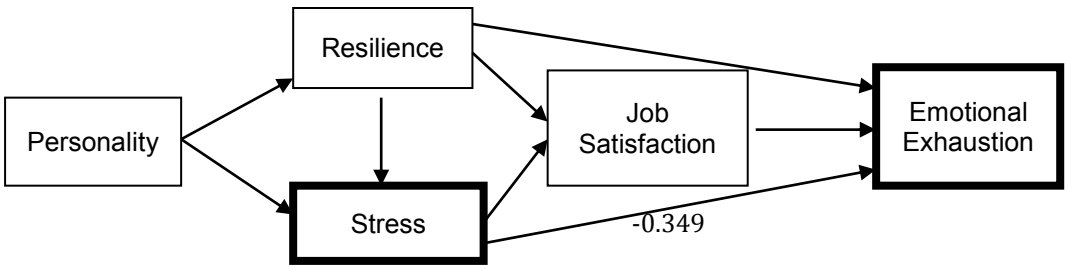
'Maybe...junior〔nurses〕prefer to talk to you, less distance between us.'

Case 15

'I operate in coordination well, especially in getting along with colleagues.'

Stress and Emotional Exhaustion

Figure 21. The relationship between stress and emotional exhaustion in interview



Significantly, a positive relationship between stress and emotional exhaustion was confirmed. Nurses described stressful situations followed by an expression of their exhaustion with work. Stress may be represented in physical unwelness or fierce emotional responses:

Case 1

'When I felt physically unwell, it implicated my mood.'

Case 34

'When you were too busy to have a meal, you had a lot of things to do but the shift exchange was coming; your head couldn't integrate, so you mentioned a little this and a little that. The senior nurses would feel annoyed and didn't know what you were talking about; then they became picky. Then I would feel I was so tired, also I still had so many things to deal with, and I didn't have time to eat; what do you want from me? At that time, I really felt I was fed up.'

Other themes

Other meaningful themes related to the special issue of thoughts about life and death in cancer nursing, the ways cancer nurses coped with their stressful situations or tough times, the reasons why they stay or intend to leave their jobs were extracted from interview data.

Thoughts about life and death

In the interview, several nurses talked about their thoughts of life and death. Being a cancer nurse indeed drove them to think more about death and treasure their time with their family. In Taiwanese society, it is taboo to talk about death with patients or older people. However, participants see death as a extricating from suffering and disease in cancer patients; and this opinion helped them to accept patients' death: (Other quotations are in Appendix 12 section a)

Case 21

'When patients leave 〔die〕, I might feel sad, but it wouldn't last too long. Because I felt they had been out of the … suffering bodies.'

Case 31

'In the beginning, I felt such despair. It's hard to adjust for me. I feel cancer is so terrible. One day, my thought changed, I heard a physician talked to a patient: 'I can't tell you when you will leave, but if we all know what will be the result, why don't we make the best of those days?' I started to think of those patients who only have one or two months left, how can they leave some memory for families and each other.'

Case 33

'I feel to whom beside me, especially my family, I treasure them more. And I care more about what they feel now. I am more sensitive in mind.'

Reasons for turnover

Nurses mentioned some situations that made them really want to leave their jobs. Tiredness was mentioned most commonly including physical and mental aspects; in addition, nurses expressed how sufficient rest is important to them. As nurses aged, they worried about not being competent because of their decreasing physical strength. One of the things affecting nurses' mental health is seeing patients die with a feeling of powerlessness. Having appropriate long breaks such as 3-4 days off may allow nurses to recover from fatigue, to leave hospital circumstance, to deal with personal affairs or to engage in their interests. However, sufficient days off relies on adequate manpower; another factor that caused nurses' intention to leave was delay of coming off work. Senior nurses may feel their job was routine and repetitive with nothing new; thus the job became tedious: (Other quotations may be found in Appendix 12 section b)

Case 27

'〔Cancer nurses〕keep seeing death or patients with long-term disease and feeling lack of energy, so generally speaking … for normal people it's hard to stay … stay long. Besides, I feel nursing is like this … when you keep doing homogeneous work, you felt bored. I also worry that my physical strength will be insufficient one day … and being too tired causes sterility. … You want to leave because you have arguments with colleagues, or you can't stand colleagues or supervisors.'

In Taiwan, nurses usually quit after they get married; especially when they have children. Families expect females take the responsibility of looking after children and housework; the frequent delays coming off work and night shifts caused difficulties to nurses in remaining in their job:

Case 5

'After I get married, I might find other jobs; because my husband thinks working in this unit is a job of toil…. I can rest on Saturdays and Sundays, and leave office on time, such kinds of work. He prefers me to transfer to other units in the hospital, rather than such nature of work. He prefers me not to continue to stay in this unit, because he thinks chemotherapy is not okay for the future (means having baby). But…I personally think it is fine.'

Effective Coping

Nurses brought out various coping strategies to overcome hard times at work; effective coping strategies helped nurses stay in their job. As the following section shows, nurses indicated the coping strategies that they thought to be effective to deal with their stress or burnout. The most common method is talking to close friends, colleagues or partners, but some nurses rarely spoke to families about their difficulties in work. One reason was their families were unable to understand the context or real situation of their work; the other reason was they feared that their families worried about them. Complaining to colleagues or head nurses was an unleashing method which also made nurses feels support from team members; sometimes nurses would seek suggestions from senior colleagues or who had the same situations before. Crying out was sometimes used. Several methods could help nurses transfer their attention from those stressors and difficulties in work, such as going out shopping, dining with friends, watching movies, reading books, travelling and exercising. Few nurses just slept when they were off to have complete rest and think about nothing. In the case of health problems like UTI (urinary tract infection), nurses forced themselves to drink a certain amount of water and go to the toilet regularly. Forcing themselves to exercise or avoiding night shifts were actions also taken by nurses. Some nurses felt refreshed or re-motivated after attending a conference to renew knowledge and interact with other nurses: (Other quotations can be found in Appendix 12 section c)

Case 5

'Just keep talking to others … I always work off my anger here, after complaining, I am fine. All my complaints disappeared after I say them out. I seldom kept them in my mind.'

Case 6

'I have massage regularly. I would take exercise, talk to my colleague … just listen to music, see a film, have a big meal … ask for some holidays to have a trip abroad.'

Case 30

'I would like to go to open places, like climbing mountain. … Keeping diary or attending favour conferences to meet people who have enthusiasm in nursing. After the conferences, I could go back for work with more motivation.'

Three nurses pointed out they had insomnia problems due to night shifts or stress, and they needed to take sleeping pills. Medication is common among nurses, but it exposes nurses to the danger of drug abuse:

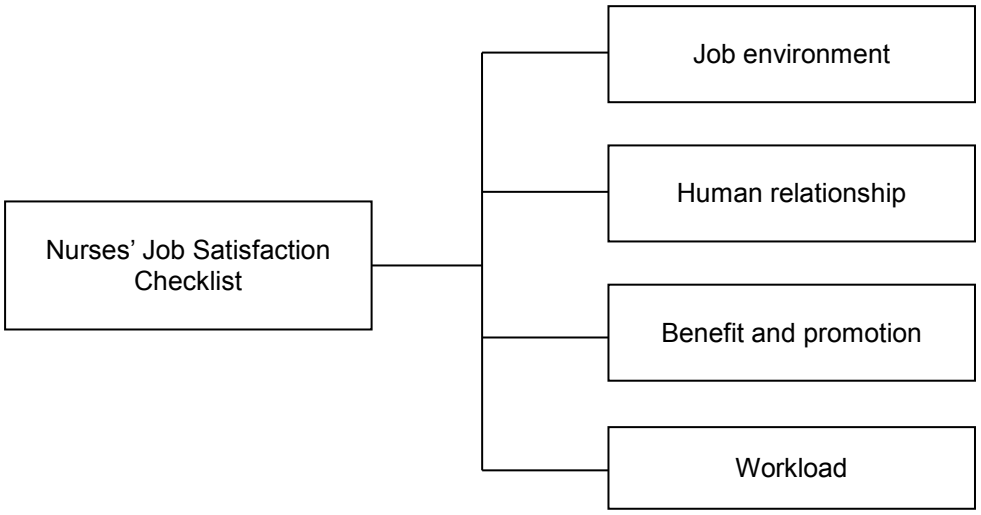
Case 5

'If I am on the night shift, in this case I would be unable to fall asleep, and I would take sleeping pills.'

Intention to stay

While asking nurses what made them feel satisfied in the work, they mostly answered no particular feeling about job satisfaction. However, when asked about the reasons that made them stay, some of their answers were related to job satisfaction (the component dimensions in Nurses' Job Satisfaction Scale please refer to Figure.22). Nurses stated reasons for staying in their present jobs, included: 1) financial needs; 2) family's positive support; 3) good relationships with supervisors and colleagues; 4) satisfied with work environment and 5) salary, 6) good unit atmosphere and 7) fulfilment of work achievement. Of the reasons, reason 4 was related to job environment; reason 5 was associated with benefit and promotion; and reason 6 could be referred to as human relationship in the Nurses' Job Satisfaction Scale.

Figure 22. Four dimensions in Nurses' Job Satisfaction Checklist



Some nurses thought they might not find better jobs if they leave their current position, or that it is hard for them to change their specialist areas; therefore, they were not willing to risk changing jobs. There were nurses who expressed their enthusiasm for cancer nursing, and they valued their experiences in making a contribution of patient care; as such it was lamentable when senior nurses leave their jobs: (Other quotations are in Appendix 12 section d)

Case 3

'I just hope my team has good atmosphere. As long as the work atmosphere and the people surrounding me are good, I don't care how tiring this work is.'

Case 27

'I feel this is the thing that I can do, and I do it quite well. … I'm not very interesting in other specialisms. I chose oncology is because I know this is the disease that humans can't avoid. When we stay long enough in oncology, we still have some ideals and dreams; that is we hope cancer patients can get better care. If we keep staying, could we do more? Then, the difficulty of nursing manpower should be improved; many difficulties happen because of manpower. Sometimes I conflict with leaving or staying; it is pity if leaving, because I have been doing this for a long time and some things only we know.'

4.10 Discussion of Qualitative Results

The purpose of interviewing cancer nurses after they completed the questionnaire survey was to check whether the selected questionnaires truly reflected nurses' personality, stress, burnout, job satisfaction and resilience. This section will explain the extent to which the interview data fitted the survey data. Themes not included in the NSC, major stressors like being novice nurses and the reasons that make nurses intend to stay or leave will now be discussed.

4.10.1 Validation of the Questionnaires

From the themes and quotations that emerged, several conclusions can be made. The NEO-FFI-3 was able to test the Big Five personality perfectly with very few disagreements (Appendix 8). Most nurses' stress was expressed as stressors, and could be categorised into four dimensions in the NSC. This may be due to the intrinsic characteristic of stress as it is defined in the literature review; Baum (1990) defined stress as a stimulus or stressor caused by a threatening events from the external environment. In addition, expressing a stressor may be easier than describing how strong stress is. Themes related to burnout perfectly reflected and matched with the three dimensions of the MBI-HSS. This demonstrated the validity of the MBI-HSS. EE was particularly stated among nurses frequently which also reflected the high scores on EE in questionnaire survey. Nurses' job satisfaction was not detected directly by asking nurses what made them feel satisfied in work; instead of answering how satisfied with their job they were, nurses brought out their satisfaction in the reasons for staying in their present jobs. However, job dissatisfaction was largely found among the themes of stress and burnout. For instance, communication problems with others mentioned in the stress section may be referred to as a dissatisfaction of human relationships in job satisfaction. In addition, job dissatisfaction was also revealed in burnout section; such as nurses thought their payments did not reflect their hard work in the job, and this could be categorised in benefit and promotion in the NJSS.

Furthermore, rather than describing how stressful nurses' work is, what nurses mentioned in the interviews were more like stressors. This might be due to the inappropriate design of the interview guideline; it did not designate a time frame of the latest one week as the NSC did, and did not ask how strong stressful feelings were. However, most of the interview findings about stress still reflected the components in the NSC. This might indicate that stress is cumulative, so that long term stress may lead to the occurrence of burnout.

There was only one quotation found in the interview about resilience. This may be due to the fact that resilience is hard to describe. Rather than illustrate the level of resilience, nurses in this study may state their resilience in the way they coped with stress or burnout in work. The coping strategies expressed the actual processes of being resilient in work.

4.10.2 Missing Stress Themes in NSC

From the themes of stress that emerged in the interview data, several themes were not revealed in the NSC, including: 1) watching patients suffering or dying; 2) worry about a dangerous working environment; 3) insufficient manpower; 4) being a new nurse, 5) looking after new nurses; 6) paperwork about patient care and academic reports for moving up clinical ladders; 7) extra tasks of hospital accreditation or nursing administration. The first two themes are related to the specialised field of cancer caring, and the rest reflected the contemporary circumstances of nursing in Taiwan. These seven themes could be added in future questionnaires to a nurses' stress survey.

4.10.3 Stressors in Cancer Nurses – What Previous Studies Said

All the themes and subthemes in section 4.9.2 were congruent with earlier studies. There were two top stressors defined by cancer nurses in the study by Barnard et

al. study (2006): ‘‘When nurses and doctors are not communicating well about patients’’ and ‘‘Feeling I can’t get all of my work done’’. In addition, ‘Making mistakes’ was the most intense stressor among cancer nurses, and not surprisingly, ‘Watching a patient suffer and not be able to do anything about it’ made nurses feel stressed. A longitudinal study in France indicated that most oncology nurses’ stress was related to three dimensions: inadequate training; lack of time to deal with the psychological component of care-giving especially terminal care; and relationship difficulties with other medical staff (Escot et al., 2001).

4.10.4 Novice Nurses’ Stress

Another interesting appearance in the interview findings about stress was nurses’ descriptions about how stressful situations happened from the new nurse stage. The stress principally came from the unfamiliarity with or uncertainty with cancer treatment, and lack of communication skills. Completing tasks accurately, noticing sudden and emergent situations and learning, simultaneously drained the energy of nurses. Nurses showed the highest intention to leave their jobs in this phase of their careers. These difficult circumstances stated in the study by Read and Laschinger (2013) were: newly graduated nurses’ experienced bullying; co-worker incivility and supervisor incivility in workplace; bullying was more related to job satisfaction and EE in burnout. New nurses are particularly stressed in their first few months (O'Shea and Kelly, 2007). This state was in line with the research by Yeh and Yu (2009) in Taiwan where 31.5% (total participants: n=146) of newly graduated nurses had the intention to quit. New nurses who intended to leave presented higher job stress levels regarding interpersonal relationships, despite the average of stress score among new nurses being 2.89 which was moderate (full score is 5). Nurses who had had clinical practice internship in the hospital where they work showed less intention to leave (Yeh and Yu, 2009).

Transitions from student to staff nurse are considered to be complex and stressful and full of challenges (Huang, 2004). Mostly stressful situation for new nurses

included: effectively communicating with patients and families (Maben and Macleod Clark, 1998; Ellerton and Gregor, 2003); excessive workload (Huang, 2004; Suresh et al., 2013); interpersonal relationships (Huang, 2004; Suresh et al., 2013); dealing with emergencies (Yeh and Yu, 2009); dealing with death/dying (Maben and Macleod Clark, 1998; Yeh and Yu, 2009; Suresh et al., 2013); shift changes; assessing patients' conditions and changes (Yeh and Yu, 2009); administering unfamiliar medication, treatment and equipment (Ellerton and Gregor, 2003; Huang, 2004; Yeh and Yu, 2009; Suresh et al., 2013). Hodges et al. (2008) and Houghton et al. (2012) indicated that there is a gap between how nurse students were taught in school and the clinical setting; therefore, peer support, appropriate supervision and opportunities to learn may help novice nurses to adapt themselves from students to independent nurses.

Cancer caring is a tough field to enter for newly graduated nurses. Therefore, new nurses need appropriate guidance and intense attention to help them pass through the freshman stage. Especially, mentors may help new nurses to find fulfilment in work, such as patients' positive feedback, patients' good outcome; in addition, colleagues' admiration and offering coping strategies could be helpful. It is necessary to offer a safe environment to encourage new nurses to ask when they are inexperienced and feel free to report when they make mistakes.

4.10.5 Reasons to Leave or Stay in Cancer Nursing

The participants were young with average age 28.7, but the mean time of intention to stay in the current job was only 6.4 years and of intention to stay in nursing was 9.5. The likely explanations may be the high prevalence of emotional exhaustion in the questionnaire survey and depression in the interview survey; also the worries mentioned in interviews that nurses were afraid that their diminishing physical strength and family responsibilities after marriage would make them want to leave nursing. In addition, when the nurses lacked rest and their tiredness could not been dissipated; that was the moment they wanted to give up the job.

The sub-themes among the reasons of intention to leave identified in this research are confirmed in Shih's et al. retrospective study (2013) in Taiwan. The prime reasons causing nurses' turnover included: 1) the overload of clinical and paper work; 2) work-life imbalance and lack of rest resulting from shift work; 3) debates related to medical decision in clinical settings; and 4) the poor quality of life due to lack of manpower and legitimate vacations. Chen et al. (2008) in Taiwan showed workload was acknowledged as the main indicator in predicting nurses' turnover. In New Zealand a study to explore the contributing factors to leaving and returning to nursing practice (Jamieson and Taua, 2009) showed that nurses left their jobs for three main reasons: personal life; working conditions; and career change. Personal life could be related to the long distance from home to hospital or family matters like child care responsibility; working conditions were mentioned such as understaffing, stress, poor leadership or support and dislike of shift work; and career change was due to entry into completely different occupations. Therefore, workload is a major factor which has an impact on nurses' work-life balance and leads to nurses' turnover.

In the interviews, many nurses stated that work overload work made them work overtime, and the delay of work caused burden in their mind that they are affecting colleague on the next shift. These phenomena imply a lack of manpower in nursing; and increasing manpower has been suggested in former investigations. Insufficient nursing manpower may cause several severe problems such as increasing patient mortality, nurses' burnout and dissatisfaction (Aiken et al., 2002). It is suggested that workload should be measured on the ward to prevent nurses' burnout and unrecoverable tiredness.

On the contrary, nurses who would like to stay in their current jobs usually expressed their satisfaction with the working atmosphere, environment and leadership; and they mentioned very good relationships with the head nurses or colleagues. These reasons for why nurses stay overlapped with the job satisfaction component dimensions of job environment and human relationship. Furthermore,

some of the nurses recognised their self-identity and self-growth in cancer caring. Meanwhile, several nurses expressed their intention to stay in this tough caring area because they had clinical practices in cancer wards; thus they knew the characteristics of cancer nursing, and they were willing to devote themselves to this profession (Yeh and Yu, 2009). Of the reasons to stay mentioned above, some reflect the strategies of building resilience and interventions to reduce burnout which will be stated in the next chapter, some are reflected in a recent research paper (accepted but not yet published) which explored the reasons that make nurses resilient and choose to remain in the workforce (Cope et al., 2015).

Nurses demonstrated their resilience at work when they had social support from colleagues, families and friends which was reliable and kept them going in nursing. Nurses also expressed their altruistic desire and their passion for the profession. They tried to use self-management skills to deal with stressful situations, to stay positive, to view dilemmas as challenge, and to find mindfulness and pride in work. From overcoming adversity in work, they perceived self-growth; and leaders who respected nurses and offered a hopeful work environment were valued by nurses in their staying. It may be very important to build resilience in the new nurse stage to help nurses remain in their work.

4.11 Conclusion

This chapter has shown the relationships between personality and resilience, stress, burnout and job satisfaction in the best-fitting model using SEM. Interview results indicated that selected questionnaires possessed good validity, and some significant correlations in the SEM model were confirmed in interview analysis. Further discussion about relationships in the best-fit model and the relationships underpinned by interview data will be continued in the next chapter.

Chapter 5 Discussion

5.1 Introduction

The purpose of this study was to explore the relationship between personality and stress, burnout, job satisfaction and resilience in cancer nurses, and to use the interview data to support/challenge the findings of the questionnaire survey. Following the main findings in the previous chapter, this chapter will discuss: the significant relationships in the best-fit model and comparisons with previous studies and the themed emerged from the interviews which underpinned the significant findings. The possible explanations of the results, strengths and weaknesses of this study will be stated.

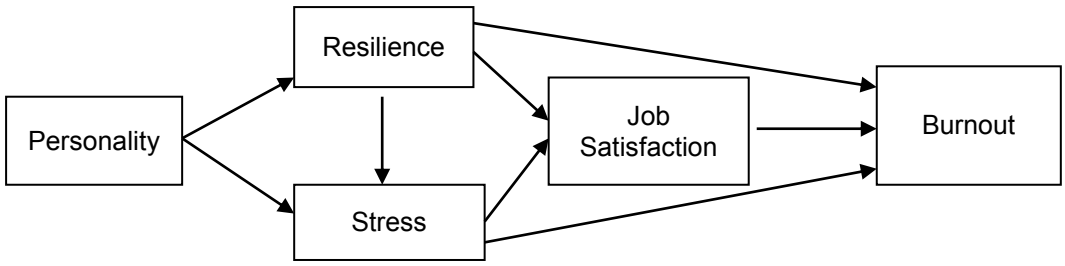
5.2 The best Model for Explaining the Relationships between Personality and Stress, Burnout, Job satisfaction and Resilience in Cancer Nurses

5.2.1 An Overview from Personality to Burnout

In terms of answering the research question 'what is the relationship between personality traits and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses', some conclusions can be made. Neuroticism influenced resilience, stress and burnout strongly; openness to experience slightly affected resilience and strongly influenced emotional exhaustion (EE); and conscientiousness was moderately associated with resilience, stress, depersonalization (DP) and has a strong impacted on EE. Before this study, people may have thought extraversion and agreeableness are the two most important personality traits to help nurses to adapt to their job well especially in developing relationships with colleagues and

patients. However, in the path analysis model (Figure 23), extraversion and agreeableness had no significant impact on nurses' burnout.

Figure 23. The Best-fit Path Model of Presenting Relationship between Personality and Stress, Burnout, Job satisfaction and Resilience



Meanwhile, resilience was proved to be an effective mediator between personality and stress, job satisfaction and burnout. Subsequently, stress influenced burnout to a significant level. Job satisfaction carried only a very little weight in burnout and was influenced by resilience and stress slightly; personality had no direct effect on satisfaction and burnout; still, personality was extremely weak in predicting nurses' intention to stay.

5.2.2 The Relationship between Personality and Burnout

The best-fit model testified that three personality traits were significant predictors of burnout: neuroticism, openness to experience and consciousness. Neuroticism was significantly related to EE (Zellars et al., 2000; Buhler and Land, 2003), PA and DP (Buhler and Land, 2003); openness to experience was associated with EE; and conscientiousness impacted on EE and DP (Garrosa et al., 2010). The relationship between personality and burnout was investigated in a nursing student group by Deary et al. (2003): a similar conclusion was made. Nurse students' personality was measured in NEO-FFI when they entered the programme (Time 1), and

burnout was measured 12 months (Time 2) and 24 months (Time 3) into the programme. Neuroticism was significantly related to EE at time 2, but not at time 3. Openness to experience was significantly associated with EE at time 3. Agreeableness was significantly related to DP at time 2. Conscientiousness was significantly related to DP at time 3 and PA at both time 2 and time 3. In a meta-analytic study by Swider and Zimmerman (2010), again, neuroticism had the strongest effect on burnout; its true score correlation to EE, DP and PA were 0.52, 0.42 and -0.38 respectively. Openness to experience only weakly related with burnout, the correlations were -0.90 (EE), -0.10 (DP) and 0.21 (PA). Conscientiousness had a modest effect on burnout: the correlations were -.19 (EE), -0.24 (DP) and 0.28 (PA). Nonetheless, extraversion was moderately related to burnout and agreeableness was only modestly associated with burnout. In Garrosa's et al. (2010) study, control in hardy personality (similar to conscientiousness) was negatively related to all of three dimensions in burnout. Therefore, some incongruence was found; the congruent results of previous studies and this research are presented in bold in table 26.

Table 26. Comparisons of significant relationships found between personality and burnout among studies

Personality/ Burnout	Emotional Exhaustion	Personal Accomplishment	Depersonalization
Neuroticism	***Confirmed in this study *Swider and Zimmerman, 2010 *Deary et al., 2003 *Buhler and Land, 2003 *Zellars et al., 2000**	***Confirmed in this study *Swider and Zimmerman, 2010**	***Confirmed in this study *Swider and Zimmerman, 2010 *Buhler and Land, 2003**
Extraversion	*Buhler and Land, 2003	*Buhler and Land, 2003 *Zellars et al., 2000	*Buhler and Land, 2003 *Zellars et al., 2000
Openness to Experience	***Confirmed in this study *Deary et al., 2003 *Swider and Zimmerman, 2010**	*Hudek-Kenzevic, Maglica and Krapic (2011) *Swider and Zimmerman, 2010 *Zellars et al., 2000	*Swider and Zimmerman, 2010 *Zellars et al., 2000
Agreeableness	*Hudek-Kenzevic, Maglica and Krapic (2011)	*Hudek-Kenzevic, Maglica and Krapic (2011)	*Hudek-Kenzevic, Maglica and Krapic (2011) *Deary et al., 2003 *Zellars et al., 2000
Conscientiousness	***Confirmed in this study *Swider and Zimmerman, 2010 *Garrosa et al., 2010**	*Swider and Zimmerman, 2010 *Garrosa et al., 2010 *Deary et al., 2003	***Confirmed in this study *Swider and Zimmerman, 2010 *Garrosa et al., 2010 *Deary et al., 2003**

Nurses with higher neuroticism (N) may be more vulnerable and influenced sensitively to stimuli (McCrae and John, 1992; Penley and Tomaka, 2002), and they tend to be maladjusted and less emotional stable (Coast and McCare, 1992). Therefore, resilience, stress and burnout levels in cancer nurses were highly related with and may be explained by neuroticism scores. Openness to experience (O) influences an individual negatively in perceiving stress and positively in active coping; active coping means the individual actively engaging in the demands and striving to reach them (Penley and Tomaka, 2002); this may explain the impact of O on emotional exhaustion (EE). As with openness, conscientiousness is negatively associated with stress, perceiving task demand and threat, and positively related with active coping. A high C score influences an individual in perceiving that he/she has the ability to manage adverse events with self-disciplined and achievement-oriented characteristics (Coast and McCare, 1992; McCrae and John, 1992; Penley and Tomaka, 2002). This may reflect the effects of C on EE and DP.

5.2.3 Resilience as a Mediator

Resilience is a predominant and effective mediator to cancer nurses' stress and burnout. Successful strategies for building up nurses' resilience may be helpful in the retention of nurses and help them to overcome difficult times in their work. In this study, N was greatly and negatively correlated with resilience, a finding supported by Campbell-Sills et al. (2006); O and C were positively correlated with resilience. This indicated that nurses with various personalities have more or less ability to bounce back. This result was echoed by other studies. Conscientious people are self-disciplined and hard-working: they are thought to be more resilient (Furnham et al., 1997; Campbell-Sills et al., 2006; Wei and Taormina, 2014). However, Wei and Taormina (2014) indicated that worry as a characteristic of neuroticism makes neurotic people more determined to find solutions and more adaptable to difficulties. In addition, higher resilience in work is also confirmed to be positively related to higher job satisfaction (Lounsbury et al., 2003; Wei and Taormina, 2014).

5.2.4 Stress as a Mediator

N, O and C were found to be significantly correlated with stress in the present Thesis. Personality could be used to predict nurses' perceptions of stress at work. In contrast, Burgess et al. (2010) found that personality did not show significant correlation with stress in ICU nurses. However, Burgess et al. (2010) claimed that O and extraversion (E) may be buffering factors for workplace stress, as the results showed that nurses with O and E dispositions performed better in dealing with difficult patient and relatives, and conscientious nurses felt more confident and competent in managing time pressure and workload stress.

The results of the research in this Thesis showed that stress level as a contributor to burnout was significantly strongly associated with EE, moderately with DP and

PA. This finding is also implied in the research by Barnard et al. (2006), where stressors are associated with EE and DP positively and significantly. Likewise, in a large scale questionnaire survey in South Africa (Khamisa et al., 2015), nurses' stress in work could predict burnout, and stress from staff issues is able to explain the highest variance in burnout. Using multiple linear regression, staff issues such as poor staff management and inadequate equipment explained 16% of the variance in EE, 13% in DP and 10% in PA. In another group of haemodialysis nurse, their stress was associated with EE to a great level: Pearson's correlation coefficient was 0.52, but only with low strength in DP (0.34) and PA (-0.21) (Hayes et al., 2013). Those research results are predictable and understandable, because stress /stressors and burnout (especial EE) share many components such as issues of interpersonal relationship or communication. In addition, nurses with high stress may use depersonalization as a coping strategy to prevent themselves from further burnout; and personal accomplishment which is a reverse factor in burnout may reveal nurses' resilience in viewing positive and inspiring sides of their work.

5.2.5 Job Satisfaction in the Path Model

This research has found moderate correlations between stress and job satisfaction, and between job satisfaction and burnout; but job satisfaction can only be explained by personality with a very small variance with significant indirect effect inside the model. Comparable research by Meeusen et al. (2010) found that 'orderly characteristic' which can be referred to C, is significantly related to job satisfaction in anaesthetist nurses. Similar findings were addressed in a cross-sectional online survey among haemodialysis nurses (Hayes et al., 2013): by Pearson's correlation, job satisfaction has strong strength of relationships with job stress (-0.52) and EE (-0.56), and only has small correlation with DP (-0.30) and PA (0.29). Khamisa et al. (2015) also revealed a significant association between burnout and job satisfaction. In contrast, Burgess et al. (2010) found that personality traits have no significant correlation with job satisfaction in critical care nurses.

Job satisfaction is much more related to extrinsic factors like payment, benefit and promotion opportunities in organizations; equipment in ward; multi-discipline cooperation; leadership styles etc. Therefore, as personality is an intrinsic factor in the individual, job satisfaction was not found to mediate strongly between burnout and the other variables in this study.

5.2.6 Summary

It is suggested that personality be used in predicting nurses' resilience, stress and burnout as a pre-employed screening tool. Nurses possessing different personality trait may need different assistance and support in work. Nurses presenting with higher N scores should be given extra support due to the fact that they may experience less personal accomplishment in work and be vulnerable to burnout. Mentors could help them to emphasise positive dimensions and feedback at work, and assist them in managing emotional responses before coping with and facing problems. Nurses who possess high C may adapt to their job better; however, burnout could be prevalent in this group, resulting from their achievement orientation and their setting up high standards for themselves to achieve goals. Thus, relaxation skills and peer support should be helpful to alleviate stress and prevent nurses from burnout. Nurses with high O characteristic may find it easier to accept advice or help from others, and they tend to use active coping strategies such as focusing on the task and finding the best approach to perform it. Although E and Agreeableness (A) failed to explain the variances of other variables in the best fit model, some advice could be given to help them adapt to nursing work. Agreeable nurses may have greater needs to build harmonious relationships with colleagues and desire to cooperate with others; therefore, helping them to establish good relationship in the medical team is important. Extraversion seems to be important and popular in service industry, but it is not as important in nursing. However, in the interviews of this study, many nurses felt that their extraversion helps them establish good relationships with patients, and their extravert characteristics make patients happier. In addition, they feel fulfilment and

recognised the meaningfulness of their job when they think they can help patients greatly.

5.3 Significant Relationship across Questionnaire Survey and In-depth Interview

Although not all of the five personality were significantly associated with resilience, stress, job satisfaction and burnout, all nurses said that their personality impacted on their work. Nurses' stress and burnout were related with past experiences in the interview. The similar events described by different nurses but they had different responses to the events, this may explain the influences caused by personality. Furthermore, stress was considered to cause EE by nurses; this implied the theory that burnout is the outcome of chronic stress (Schaufeli et al., 1993).

The relationships between the nurse's personality and stress, burnout and job satisfaction identified in interview are shown in Table 27 below. The agreement relationships between the quantitative and the qualitative data will be displayed in bold and larger size. The symbol '↑' represents positive correlation between variables; in contrast, the symbol '↓'represents a negative relationship in the interview data. Symbol '×' means that no nurse mentioned that factor in the interview.

Table 27. Relationships identified between Personality and Stress, Burnout and Job Satisfaction in the Interview Data

Endogenous variables/ Personality	Stress	Burnout	Job Satisfaction
Higher Neuroticism	↓	↑ (EE)	×
Higher Extraversion	↓	↓ (DP)	↑
Higher Openness to Experience	↓	×	×
Higher Agreeableness	×	↓ (DP)	↑
Higher Conscientiousness	↓	×	×

EE: Emotional Exhaustion; DP: Depersonalization.

The consistent relationships between quantitative results and qualitative results were: 1) N was positively correlated with burnout; 2) O was negatively related with stress and 3) C was negatively associated with stress. Nurses scoring high in N thought they were prone to EE. Nurses who had O dispositions felt more competence in solving problems. Nurses considered that conscientiousness helped them to work more efficiently so they felt more competent in patient care.

The quantitative and qualitative data gave six non-congruent results for relationships. One nurse thought N made her confront the challenging and intense work; therefore the stress perceived in work was less. Extraversion (E) and agreeableness (A) did not significantly predict nurses' stress, burnout and job satisfaction in the quantitative findings. However, in the interviews, E was seen as able to reduce stress and burnout because extravert nurses thought that E helped them to establish good interpersonal relationships with patients easily and there were few incidents of DP. Also, nurses felt that E increased their job satisfaction in terms of the good relationship with colleagues. Nurses believed A decreased the

occurrence of DP and increased their job satisfaction in good interpersonal relationship with patients and colleagues.

From the interview data, the job specialism of cancer nursing can have an impact on nurses in many dimensions. Not only did they relate stress and burnout to physical and psychological problems, but these had also been influenced the way they perceived life, death and their relationships with their families. Thus, life-work balance should be emphasised for occupational health. In many cases, nurses indicated that peer support or comfort from head nurses at the right moment were extremely important in alleviating stress and solve the problems. Ignoring nurses' responses to stressful events may accumulate their stress and lead to burnout. These findings echoed the reasons to stay found in this study. The most mentioned of reason to stay in the answers were very simple: good work atmosphere, good relationship with colleagues, endorsed leadership-style, salary and fulfilment in work achievement, which mainly belonged to job satisfaction although job satisfaction as such only had a small influence on the model.

5.4 Implications of the Research Results

The questionnaires selected in this study possessed excellent reliability. This makes them appropriate for administration and monitoring, but effective communication channels between administrators and nurses are still needed. New nurses should be interviewed intervals of three months, six months and one year; and at least one interview may be necessary annually in senior nurses to understand personal needs or future plans. For those nurses who are experiencing situations which have a high risk of burnout and failing to cope with dilemmas in their work and in their personal lives, head nurses perhaps have to offer help, or give them long leave for returning their balance status under proper monitoring.

5.4.1 Personality as a Tool in Nursing Administration

Personality has been demonstrated to be a valid predictor of nurses' resilience (Gillespie et al., 2007), stress, job satisfaction (Meeusen et al., 2010) and burnout (Eastburg et al., 1994; Zellars et al., 2000; Garrosa et al., 2008; Garrosa et al., 2010; Meeusen et al., 2011). Neuroticism is particularly important in affecting nurses' perception of stress and burnout; and EE is explained by N, O and C in 50.9% of the variance. Therefore, personality measurement could be used in pre-employed screening to understand the personal characteristics of new nurses; and then the mentors would be able to offer support accordingly. For example, new nurses presenting with very high neuroticism scores may need additional alertness of burnout syndromes; giving oncology nursing training and guiding them to work in a way well-disciplined by transmitted experience could mitigate their anxiety and hazardous responses to stressful or adverse events. N was not highly correlated with burnout, but was highly related to resilience and stress. For this reason, nurses scoring high on N should be carefully offered support.

Personality testing may help nurses who are experiencing severe burnout, even to the extent that they want to leave the job or to change the specialist area to understand the reasons why they react to the difficulties in work and what kind of support they may need. For instance, burnout suffered by conscientious nurses from may result of the high standards they set themselves and their intrinsic desire to work in a disciplined fashion. However, nursing is full of challenges and unpredicted patients' conditions in daily work. Therefore, superior should help conscientious nurses to recognise the nature of nursing work, to focus on dealing with priority tasks and to ask for help when they feel out of control. The same strategies could be used in nurses with high scores in N such as helping them to recognise the priority demands, and to call for help when it becomes necessary; but the purpose is different: the purpose should be helping nurses with higher scores in N to work in a disciplined way and to search for problem-focused coping strategies.

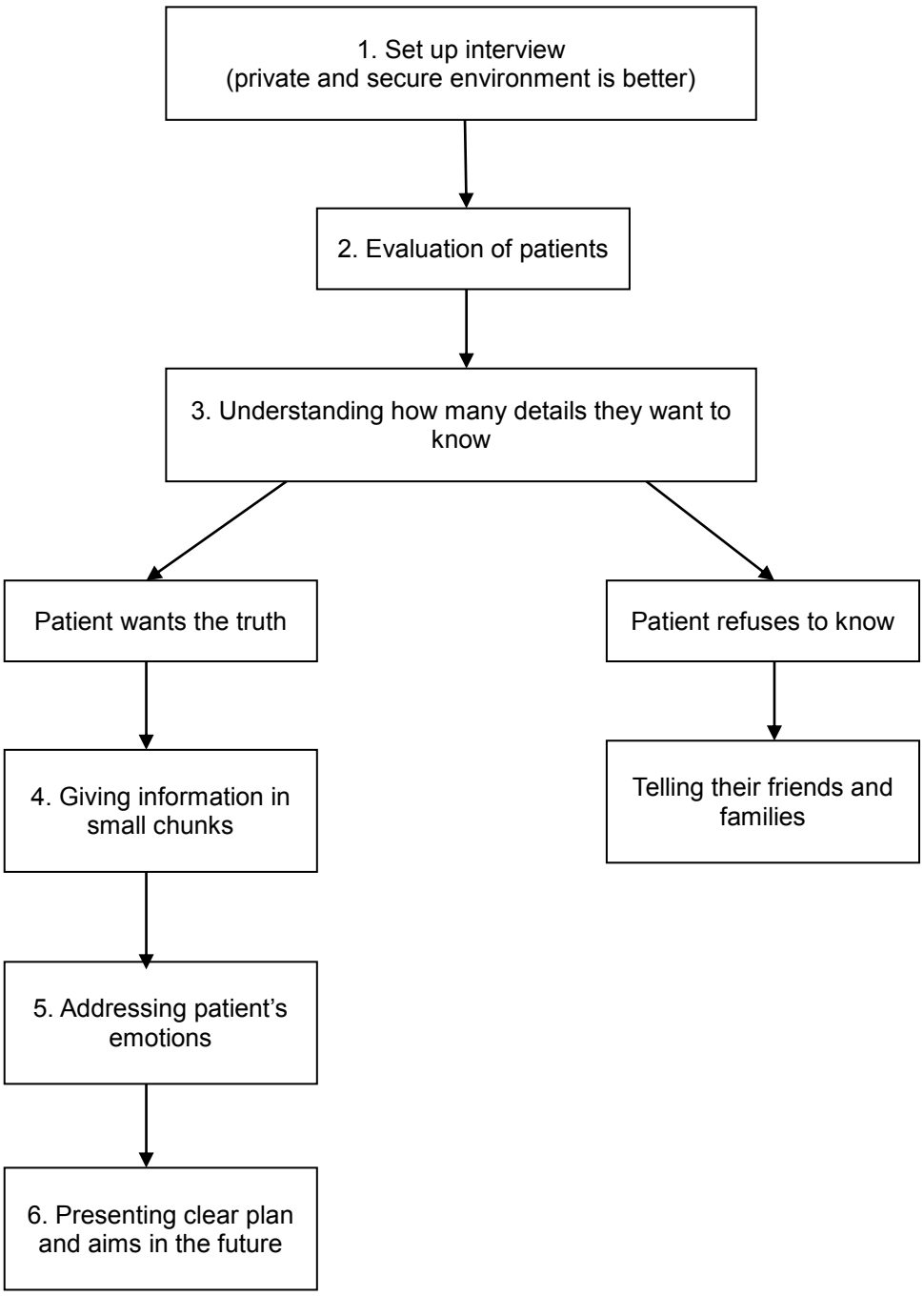
5.4.2 Communication Skills Needed in Cancer Nursing

Stress from communication and giving unfavourable information to cancer patients were mentioned frequently in the interviews. Communication dilemmas with physicians, nursing practitioners, supervisors, patients and families were not only mentioned as stressors in work, but also appeared in descriptions of the circumstances of burnout with EE. These phenomena indicate the need of effective communication skills for nurses. In the meanwhile, nurses portrayed their struggles and difficulties in seeing patients dying, or to tell patients and relatives of the approaching death. The stressful situation of contacting about death is inevitable in cancer nursing (Isikhan et al., 2004). Some foreseen dilemmas were displayed in a study of nursing at the point of transition to palliative care (Broom et al., 2015) and may help cancer nurses to understand what reality of talking about the end of life with patients will be like. Telling the truth about the dying process, dealing with patients' denial or pretended positivity, against families' resistance, and explaining palliative care, often in the face of misunderstanding, require skills.

Conflicts with physicians and nursing specialists were mentioned persistently. Relationships, ranges of responsibility, reporting channels when medical decisions may danger patients should be established (currently, nurses deal with medical orders which may be harmful by themselves or by obtaining help from senior nurses). Although the physician is the key person to tell bad news, nurses play a crucial role in helping patients understand, facing bad situations, clarifying specific needs and keeping on with anti-cancer or palliative treatments. In addition, in view of time limitations on physicians, nurses are more able to allow patients to express their fear and concerns. Nurses also need to repeat the patient's perception of the information received is accurate and sufficient. When telling significant information to patients; facial expression, eye contact, tone of voice and body language are important factors in affecting patients' feelings (Fallowfield and Jenkins, 1999; Baile et al., 2000).

In the literature, some suggestions can be found for telling bad news, since breaking bad news to patients is an extremely stressful task but inevitable and frequent in cancer care (Fallowfield and Jenkins, 1999; Baile et al., 2000). Including communication skills in cancer care training could help various cancer specialists to feel more competent and to have confidence when caring for patients (Fallowfield and Jenkins, 1999). A six step protocol for delivering bad news to cancer patients was recommended by Baile et al. (2000, see Figure 24); although this protocol was formulated for establishing doctor-patient relationship in cancer care at first, it still is helpful in cancer nursing practice.

Figure 24. Six step protocol for delivering bad news to cancer patients



The second step is assessing the patients' perceptions of their own medical situations. The third step is realizing how much information and how many details they wish to know; some patients may refuse to know details in spite of the desire of the majority of patients to know the truth. The fifth step is the most difficult

mission, addressing the patients' emotions in empathic responses. Emphasizing the continuity and best possible of treatment is very important to patients.

Communication problems happen not only between nurses and patients, but also the cooperation between multiple disciplines at work. Senior nurses or mentors should assist inexperienced nurses to establish relationships with other professional medical staffs; furthermore, nurses who are confronting difficulties or having arguments no matter whether with other hospital staff or patients should experience supportive interference from colleagues or supervisors. The communication difficulties described above, were possible due to cancer nurses being required to undertake this high psychological demanding task without appropriate emotional support. Those impacts may be reduced by nurses being preparedness; in addition, setting up a support group could be another supportive resource.

5.4.3 Further Interventions for Building Resilience, Reducing Stress and Burnout

Personality affects cancer nurses in perceiving and defining a variety of situations, and how they respond. Personality is almost unchangeable and consistent for lifetime (Matthews et al., 2009). As this research justified the view that resilience and stress are effective mediators between personality and burnout, building resilience is necessary in reducing stress and burnout in a nursing career. Eight strategies were proposed by Hart et al. (2014) after integrating literature reviews, including: 1) reframing cognition to change perception of work environment; 2) toughing up by self-growing; 3) increasing emotional toughness and 4) using emotional detachment; 5) grounding connections to obtain social support; 6) remaining work-life balance; 7) critical reflection for improving ability to tackle problems, and 8) reconciliation to enhance nurses' commitment. These strategies

were approved in an earlier literature review paper on applying personal resilience for surviving and thriving in nursing work (Jackson et al., 2007). Strategies 1, 2, 3, 4 above could be summarised as staying positive and building emotional insight; strategy 5 refers to establishing a positive attitude and nurturing a professional relationship; strategy 6 remains the same that achieving life balance; and strategies 7 and 8 can be equal with being reflective. Interestingly, in integrating intervention to reduce stress (Ruotsalainen et al., 2008; van den Tooren and de Jonge, 2008), burnout (Awa et al., 2010) and increase resilience, reframing cognition in work, becoming tougher with self-growth and obtaining strong social support are common strategies.

Barnard et al. (2006) reported that peer support slightly influences PA, and social support has a strongly negative correlation with burnout (Eastburg et al., 1994). In the result of a meta-analysis study exploring effective controlled intervention on employees' burnout (Maricuţoiu et al., 2014), no influential intervention was suggested in addressing DP and PA; nevertheless, two types of interventions based on cognitive-behavioural and relaxation techniques were effective in diminishing EE even 6 months after receiving the interventions. Cognitive-behavioural techniques aim to change the individual's perceptions of himself/herself and the world, and change behavioural action (Maricuţoiu et al., 2014). Interpersonal skills, role-related skills and organizational change are not valued in this meta-analysis (Maricuţoiu et al., 2014); this result links to the interview results of this Thesis, where peer support and social support were found to be two effective and most used coping strategies.

5.5 Strengths and Limitations of this Study

This study looked at the most important factors related to nurses' turnover, including: resilience, stress, job satisfaction and burnout; moreover, the original factor , that is personality which influences an individual in perceiving the outside

world and presenting behaviour, was used to build a model to explain the dynamic correlations among variables. The group investigated was cancer nurses, considering their specific circumstances in their clinical setting, as the work contexts and demands very so much among different specialist areas. The structural equation modelling excluded the type I error and took the unmeasured residuals of variables into account, which reflects the real world. This study confirmed the model that cancer nurses' personalities influence their resilience, stress, job satisfaction and burnout.

The cross-sectional design of this study was not able to explore the causal relationships among variables. This study was conducted in Taiwan under the national health insurance system; therefore, if this research is completed in other countries with different cultures and work contexts, the results may be different. In addition, this study included only four hospitals in Taiwan: the stressors and job satisfaction level may very from hospital to hospital.

5.6 Suggestions for Further Research

The current study indicated the role of personality in predicting resilience, stress, job satisfaction and burnout in cancer nurses, concluding that neuroticism is the key personality factor in occurrence of burnout in cancer nurses. Further research of how personality acts as a predictor in other nursing specialist groups such as emergency room nurses, psychiatric nurses, paediatric nurses, gynaecology nurses, theatre nurses and outpatient department nurses, is needed to understand what kind of personality makes nurses adapt to certain specialisms better. Research results obtained from different nursing groups may offer information for nursing administrators, nurses who want to change their specialist area and nursing students in selecting specialisms. Future research into in building resilience, decreasing stress and burnout in nurses which is based on previous literature may add personality traits to compare which kinds of intervention act effectively in nurses with certain personalities

5.7 Summary

This chapter has presented the discussion of significant relationships between personality and resilience, stress, job satisfaction and burnout in the developed model. N, O and C significantly predicted resilience, stress, job satisfaction and burnout. Resilience and stress mediated burnout strongly, while job satisfaction only influenced burnout slightly. Next, the qualitative results which reflected the significant relationships in quantitative results were outlined. Possible implications of these research results were proposed. The stress resulted from telling bad news to patients, which caused great worry to nurses; therefore, communication skills which aim to manage this problem were addressed. In addition, strategies for building up resilience and diminishing stress were suggested because of the mediation effects found in the results. Finally, in the strength and weakness section, suggestions for future research were brought up. The next chapter will aim to summarise and conclude this study.

Chapter 6 Conclusion

This chapter will summarise the aim, objectives, research methodology and key findings of this study, and further implications for nursing will be proposed.

6.1 Overview of this PhD Study

This study aimed to explore the relationships between personality and stress, burnout, job satisfaction and resilience in Taiwanese cancer nurses. Not only the relationships between personality and other four variables were tested, but also the relationships between the variables in pairs (e.g. resilience and stress, resilience and burnout, resilience and job satisfaction) were studied. From background investigation, the research conceptual framework (Figure 3, page8) was proposed. Afterward, a theoretical literature review in personality, stress, burnout, job satisfaction and resilience ; and a systematic literature review to answer 'what is the relationship between personality, stress, burnout, job satisfaction and resilience in nurses?' were carried out to identify the gap in previous studies.

A mixed method design was used. A questionnaire survey was conducted followed by an in-depth interview survey. Five independent questionnaires to test the Big Five personality, nurses' stress, burnout, nurses' job satisfaction and resilience, plus one demographic questionnaire developed by the investigator, were used. The purpose of the in-depth interviews was to examine the validity of the questionnaires, and to confirm the significant relationships in the test results. An interview guide was developed based on the structures of the selected questionnaires. Nurses from four hospitals were recruited in this study, including three medical centres and one cancer centre; in the medical centres, only cancer wards were included. Cancer nurses who offered clinical care to patients were

selected; and those who did not work in front line patient care, such as head nurses, nursing specialists and case managers, were excluded. Descriptive statistic, t-test, ANOVA (Analysis of variance), Pearson's correlation, Cronbach's α and structural equation modelling were used in testing the distribution of demographic data, the differences between groups, the reliability of questionnaires and the significant relationships among variables. Six-comparative models were developed in order to understand which model was best able to present the complex correlations among personality, resilience, stress, job satisfaction and burnout the most; the hypothesises of models based on personality was the only independent (exogenous) variable in the models. The model which possessed the best model fit index was used to test the relationships of 15 different component models; five personalities and three burnout dimensions were tested in turn, while resilience, stress and job satisfaction were fixed. Content analysis method was used to define the meaningful themes from interviews. Pilot studies of questionnaire survey and interview were conducted before the formal data collection processes.

411 effective questionnaires were returned and 35 nurses attended the interviews. Neuroticism (N) was found to be able to predict emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA) significantly; openness to experience (O) was able to predict (EE); in addition, conscientiousness (C) predicted EE and DP significantly. Emotional exhaustion was greatly explained by personality. Resilience and stress were two effective mediators to burnout (only indirect effects from personality), while job satisfaction only slightly mediated between personality and burnout. The interview data indicated the selected questionnaires possessed good validity, and the quotations of themes in the qualitative results offered more in-depth understanding of nurses' experiences in stress, burnout and job satisfaction. Some significant relationships were recognised and confirmed in the interview data; and some non-significant relationships between variables were presented as well.

Possible explanations of the significant relationships in the best fit model and

agreement/disagreement points in previous literature were proposed in the discussion. The comparisons between quantitative findings and qualitative findings were made and displayed. Further implications of the research results, strengths and limitations of this research, and suggestions for future studies were outlined in a discussion chapter. Finally, an overview and some recommendations for nursing education and administration are addressed in this chapter.

6.2 What this study has added

1) Personality significantly influences and predicts resilience, stress, job satisfaction and burnout in cancer nurses;

2) burnout can be the accumulation and later performance of work stress and dissatisfaction;

3) resilience has been confirmed as a strong mediator between personality and stress, also between personality and burnout;

4) stress is a strong mediator between personality and burnout;

5) personality has no direct effects on burnout; but the indirect effects is medium;

6) personality only explains a small variance in job satisfaction, and job satisfaction does not influence burnout as much as resilience and stress;

7) burnout significantly predicts nurses' turnover intention but only in weak correlation inside the model.

6.3 Recommendations for Nursing Continuing (In-service) Education

Nurses should be taught the symptoms of burnout to enable them to detect it in the early stages and deal with it; in addition, severe EE may need external help. Although the oncology nurse training course was demonstrated to be very useful in making cancer nurses competent about and more resistant to stress and burnout, a hospice training course should be recommended to cancer nurses or included in

cancer care training.

The mentor training course could emphasise different interventions for helping new nurses to adapt their work according to their personality traits. For example, nurses who have high N scores may benefit from peer support or skills in relaxation. In terms of all cancer nurses with all the various personalities, offering specialised cancer training courses, arranging experienced nurses as mentors to help nurses to establish relationships with colleagues, teaching communication skills, consultation for work dilemmas and obtaining coping strategies by transforming their views of work contents may be very helpful.

6.4 Recommendations for Nursing Administration

Even though the causal relationship was not confirmed in the model (Figure 23, page 164), resilience and stress could be seen as good predictors of burnout. Therefore, if time and financial resources are limited, the level of burnout could be an effective tool to evaluate work situations and the occupational health status nurses. In new nurse administration, although a one-to-one mentor system is applied in Taiwan at present, the dependent period is covered for only one month; the hospital may need to consider prolonging the supervision and cover time, and to offer long term support with consultation for new nurses. Oncology nursing training held by Taiwanese Oncology Nursing Association should be compulsory for new cancer nurses. Furthermore, informing new nurses that resources such as cancer case managers, nutritionist, hospice combined care and patient group are available in cancer patient caring may help to reduce their stress.

6.5 Recommendations for Further Research

The next step in research, comparing personality scores among various nursing specialist areas, is needed to find out whether nurse with certain personalities could adapt better to specific specialist nursing areas. Afterward, using the results of personality tests in career planning or helping nurses to shift between different specialist areas when they feel incompetent in the face of work demands, or dislike the content of work.

6.6 Summary

The occurrences of resilience, stress, burnout and job satisfaction in sequence were not consistent in previous research; and each variable could be seen as responses to work. In addition, resilience, stress and job satisfaction could be seen as mediators or predictors of burnout. Occasionally, these variables are present at the same time. The only conclusion is that they are all related to occupational health and retention in the workforce. Therefore, those variables should be monitored by employers for offering effective support to nurses and improving the policies in training or retention. Nurses are the gatekeepers for patients' health; thus, nurses' occupational health and quality of life should be greatly valued. This study offers a new model to explain how personality influences resilience, stress, job satisfaction and burnout; also the relationships among variables in Taiwanese cancer nurses.

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Appendix 1 Ethical Approval Letters

中國醫藥大學附設醫院
CHINA MEDICAL UNIVERSITY HOSPITAL
台中市北區育德路2號
2 Yude Road, Taichung, 40447, Taiwan (R.O.C.)
TEL : 886-4-22052121

Research Ethics Committee
China Medical University& Hospital, Taichung, Taiwan
Tel: 886-4-22052121 ext: 1925 Fax: 886-4-2207-1478

Date : Jul. 9, 2013

To : Chiu, Chang-Fang, Cancer Center,
China Medical University Hospital

From : Fung-Chang Sung, PhD, MPH
Chairman, Research Ethics Committee

The Research Ethics Committee has recommended the approval of the following documents:

Protocol Title : The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses.
Protocol No. / CMUH REC No. : CMUH102-REC3-073
Protocol Version : Version 2, Jul. 1, 2013
Informed Consent Form : Version 2, Jul. 1, 2013

Approval of your research project is, therefore, granted from Jul.9, 2013 to Jul.8, 2014, and has determined that human subjects will be at risk.

According to Taiwan government's regulations and ICH-GCP guidelines, by the end of this period you may be asked to inform the Board on the status of your project. If this has not been completed, you may request to send status of progress report two months before the final date for renewed approval.

You are reminded that a change in protocol in this project requires its resubmission to the Board. Also, the principal investigator must report to the Chairman of the Research Ethics Committee promptly, and in writing, any unanticipated problems involving risks to the subjects of others, such as adverse reactions to biological drugs, radio-isotopes or to medical devices.

The Research Ethics Committee

Fung-Chang Sung, PhD, MPH
Chairman, Research Ethics Committee
China Medical University& Hospital

The Committee is organized and operates in accordance with ICH6 GCP regulations and guideline.

UNIVERSITY OF Hull

Ms Tzu-Pei Yeh
Faculty of Health and Social Care
University of Hull
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HU6 7RX

FACULTY OF HEALTH AND SOCIAL CARE
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E: j.kelly@hull.ac.uk

OUR REF: 112
19 July 2013

Dear Tzu-Pei

Re: The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses

Thank you for your correspondence showing that you have Research Ethics Committee approval from the China Medical University & Hospital, Taichung, Taiwan to undertake your research.

Given the information you have provided, I am able to give Chair's approval for your study as per the Committee's Terms of Reference.

I wish you every success with your research.

Yours sincerely

J.C. Kelly

Dr Janet Kelly
Chair, Research Ethics Committee

cc: file/supervisors

醫療財團法人辜公亮基金會
和信治癌中心醫院
Koo Foundation Sun Yat-Sen Cancer Center

醫療財團法人辜公亮基金會和信治癌中心醫院人體試驗委員會

Institutional Review Board Committee
Koo Foundation Sun Yat-Sen Cancer center
125, Lih-Der Road, Pei-Tou District, Taipei, Taiwan
Phone: 2897-0011 Fax: 2898-3969

臨床試驗/研究許可書

日期：2013 年 08 月 28 日

人委會案號：20130722A

計畫名稱：台灣癌症護理人員人格特質與工作壓力、職業疲憊、工作滿意度及復原力之相關性

部門/計畫主持人：護理人員進階教育中心/ 張黎露主任

計畫文件版本日期:【計畫書:Version3:Aug. 23, 2013, 同意書:Version2. 0, dated. 2013-08-12】

上述計畫業經 2013 年 08 月 23 日本院人體試驗委員會審查同意，符合研究倫理規範。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 1 年(自 2013 年 08 月 23 日起至 2013 年 10 月 31 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，並應於到期屆滿 2 個月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

Clinical Trial/Research Approval
Koo-Foundation Sun Yat-Sen Cancer Center

Date：2013-08-28

KFSYSCC-IRB No.：20130722A

Title of protocol：The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses.

Department/ Principle Investigator：Center for Advancement of Nursing Education/ Dr. Li-lu Chang

Version date of documents：**【Protocol:Version3:Aug.23,2013 ,ICF:Version2.0,dated 2013-08-12】**

The protocol has been approved by the Institutional Review Board of the Koo-Foundation Sun Yat-Sen Cancer Center on 2013-08-23. 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 2013-08-23 to 2013-10-31). The investigator is required to report Serious Adverse Events and Unanticipated Problems in accordance with the governmental laws and regulations and SYSCC requirements and apply for a continuation review no less than two months prior to the approval expiration date.

Chairman
Institutional Review Board

台北市112北投區立德路125號 TEL:886-2-2897-0011 FAX:886-2-2897-2233
125 Lih-Der Road, Pei-Tou District, Taipei 112, Taiwan
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OUR REF: 112
29 August 2013

Dear Tzu-Pei

Re: The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses

Thank you for your correspondence showing that you have Research Ethics Committee approval from the Koo Foundation Sun Yat-Sen Cancer Center to undertake your research.

Given the information you have provided, I am able to give Chair's approval for your study as per the Committee's Terms of Reference.

I wish you every success with your research.

Yours sincerely

J a Kelly

Dr Janet Kelly
Chair, Research Ethics Committee

cc: file/supervisors

行政院國軍退除役官兵輔導委員會台北榮民總醫院
TAIPEI VETERANS GENERAL HOSPITAL, VAC
201 SHIH-PAI ROAD, SEC. 2
TAIPEI TAIWAN 11217
REPUBLIC OF CHINA
TEL: (886)-2-2871-2121(30 LINES)

同 意 臨 床 試 驗 證 明 書

查本院護理部明金蓮副主任主持之「台灣癌症病房護理人員人格特質與工作壓力、職業疲倦、工作滿意度及復原力之相關性」（本院IRB編號：2013-08-014BC）臨床試驗案，業經本院人體試驗委員會(二)審查通過，有效期限至103年10月2日，特此證明。

計畫主持人須於到期前6週提出持續審查之申請，本案須經本院人體試驗委員會通過後，方可繼續執行。（凡需送衛生署審核之計畫案件，須取得衛生署審查核准通知後，方可開始執行）

人體試驗委員會 Institutional Review Board

台北榮民總醫院
人體試驗委員會
主任委員
何善台

中 華 民 國 1 0 2 年 1 0 月 8 日

Oct 08, 2013

To Whom It May Concern:

RE: The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses
Principal Investigator: Jin-Lian Ming
Version date of documents:

1. Protocol Version: Version 2, Date: Sep 23, 2013
2. Synopsis: Version 2, Date: Sep 23, 2013
3. Informed Consent Form: Version 1, Date: Sep 23, 2013
4. Other documents:
   Information Sheet(受試者說明書-問卷調查): Version 2, Date: Sep 23, 2013
   Abstract: Version 1, Date: Aug 01, 2013
   Questionnaire: Version 1, Date: Aug 01, 2013
   Reminder card(提醒小卡): Version 1, Date: Aug 01, 2013

VGHIRB No.: 2013-08-014BC

According to the written operating procedures, GCP, and the applicable regulatory requirements, this study project is approved by the Institutional Review Board of Taipei Veterans General Hospital. The board is organized under, and operates according to International Conference on Harmonisation (ICH) / WHO Good Clinical Practice (GCP) and the applicable laws and regulations.
This approval is valid for 1 year till Oct 02, 2014. The principal investigator is required to submit the application for extension 6 weeks before the expiration date. (If indicated by the regulations and laws, this project should be taken after the approval of Department of Health, R.O.C.)

Shung-Tai Ho, M.D.
Chairman
Institutional Review Board
Taipei Veterans General Hospital
Taiwan, R.O.C.

UNIVERSITY OF Hull

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OUR REF: 112
21 October 2013

Dear Tzu-Pei

Re: The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses

Thank you for your recent email. I can confirm that you have ethical approval to commence data collection in Taipei Veterans General Hospital.

I wish you continuing success with your research.

Yours sincerely

J. Kelly

Dr Janet Kelly
Chair, Research Ethics Committee

cc: file/supervisors/JD

正 本

發文方式：紙本遞送

檔　號：
保存年限：

國立臺灣大學醫學院附設醫院　函

地址：100臺北市中山南路7號
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電子信箱：ntuhrec@ntuh.gov.tw

受文者：本院護理部黃建華主任

發文日期：中華民國102年8月13日
發文字號：校附醫倫字第1023703656號
速別：普通件
密等及解密條件或保密期限：普通
附件：如文

裝

主旨：有關　台端所主持之「台灣癌症護理人員人格特質與工作壓力、職業疲潰、工作滿意度及復原力之相關性/The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses」（本院案號：201306081RINC）臨床試驗/研究案，符合簡易審查條件及研究倫理規範，通過本院C研究倫理委員會審查，同意核備，並提第44次會議報備追認，請　查照。

訂

說明：

一、本會同意問卷方面免除書面知情同意，但需提供受試者研究說明書。

二、本會同意之文件版本日期如下：
(一)臨床試驗/研究計畫書：Aug. 01, 2013。
(二)受試者說明及同意書：Aug. 01, 2013。
(三)問卷：Aug. 01, 2013。

三、本臨床試驗核准之有效期限為1年，計畫主持人應於到期前3個月至6週向本會提出持續審查申請，本案需經持續審查，方可繼續執行。

線

四、本臨床試驗計畫若需變更、暫停執行、中途終止或結束時，主持人應向本會提出審查申請。

五、計畫主持人及研究團隊應遵循之相關研究倫理規範，請參閱研究倫理委員會網頁http://www.ntuh.gov.tw/RECO，並遵照執行；臨床試驗執行期間，請確實依據「人體研究法」之相關規定辦理；並請計畫主持人保存所有文件備查。

六、依據國際醫學雜誌編輯委員會(The International Committee of Medical Journal Editors, ICMJE)之投稿規定，臨床試驗研究計畫投稿者，需於招募第一位受試者參與試驗前，將通過研究倫理委員會審核之臨床試驗計畫資料登錄於臨床試驗公開網站，完成登錄作業後，國際醫學雜誌編

輯委員會(ICMJE)才會接受研究結果之發表。WHO對臨床試驗研究計畫之定義為任何對受試者或特定族群進行一個或多個與健康有關的介入措施(如藥物、外科處置、器材、行為治療、飲食介入及照護過程改變)以評估對健康的效益之計畫，非屬上述臨床試驗計畫，請計畫主持人自行決定是否登錄。

七、本院已向美國國家衛生研究院(National Institutes of Health, NIH) ClinicalTrials.gov 網站- Protocol Registration System (PRS https:// register.clinicaltrials.gov/)申請本院專用帳號，供本院計畫主持人(PI) 登錄所主持之臨床試驗研究計畫，登入網頁之帳號及密碼如下列：

(一)Organization：NTaiwanUH

(二)User Name：NTUH

(三)Password：99NTUH99

八、請研究人員在邀請可能參加試驗/研究之病友、家屬或民眾時，先分發給予「臺大醫院臨床試驗/研究參與者須知」單張(如附件，請自行影印使用)，並依單張內容詳細說明參加本院之試驗或研究將受到之保護，上述給予單張之過程請記錄於病歷。

九、隨函檢附「嚴重不良事件及非預期問題通報須知」、「臨床研究重要訊息通知單」、「台大醫院臨床試驗/研究參與者須知」各乙份，請依計畫需要辦理應辦事宜。

正本：本院護理部黃婕華主任
副本：本院研究倫理委員會

院長黃冠棠

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OUR REF: 112b
13 August 2013

Dear Tzu-Pei

Re: The relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses

Thank you for your correspondence showing that you have Research Ethics Committee approval from the National Taiwan University Hospital to undertake your research.

Given the information you have provided, I am able to give Chair's approval for your study as per the Committee's Terms of Reference.

I wish you every success with your research.

Yours sincerely

Dr Janet Kelly
Chair, Research Ethics Committee

cc: file/supervisors

Appendix 2 Agreement of Using Questionnaires

PAR

Creating Connections, Changing Lives.

16204 N. FLORIDA AVENUE • LUTZ, FLORIDA 33549
Telephone: 813.968.3003 • Fax: 813.968.2598 • Web: www.parinc.com

Sent Via Email: gigslisme@yahoo.com.tw

January 15, 2013

Tzu-Pei Yeh
No. 136, Jhang-lu Rd.
Changhua 50083
Taiwan

Dear Tzu-Pei:

In response to your recent request, permission is hereby granted to you to reproduce up to a total of 450 (paper) copies of the Chinese version of the NEO Five-Factor Inventory-3 (NEO-FFI-3) for use in your research titled, *Exploring the relationship between personality and job satisfaction, stress and burnout of Taiwanese cancer nurses.* If additional copies are needed, it will be necessary to write to PAR for further permission. Permission is also granted for you to include up to a total of three (3) sample items from the NEO-FFI-3 in the appendix of your thesis.

This Agreement is subject to the following restrictions:

(1) Any and all materials used will contain the following credit line:

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BY: Tzu-Pei Yeh
TZU-PEI YEH

DATE: 16 - Jan - 2013

ACCEPTED AND AGREED:

BY: Vicki M. McFadden
VICKI M. MCFADDEN

DATE: January 21, 2013

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本人擬使用蔡欣玲教授製訂之「護理人員壓力量表」，於研究計畫名稱：Exploring the relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses

中，進行研究資料收集，並同意下列兩件事項：

一、在研究報告中註明出處。

二、致送研究成果一份。

葉子琵
Yeh Tzu-Pei
（計畫主持人簽名）

姓名及名銜: Yeh, Tzu-Pei / PhD student of Nursing

服務機構: Faculty of Health and Social Care, University of Hull, UK

聯絡電話及地址: 0918-232913, +44-7428661285

No. 136, Jhang-lu Rd., Changhua City, Taiwan, 50083

問卷使用同意函

茲同意上述研究者使用「護理人員壓力量表」進行資料收集，並敬祝收案順利圓滿成功。In response to the request, permission is hereby granted to Miss Yeh, Tzu-Pei for using Nurse Stress Checklist in her PhD research.

Sing-ling Tsai
輔仁大學 護理學系

蔡欣玲教授敬上

2013 年 3 月 11 日

徵求問卷使用同意函

本人擬使用林綉娟、王小喬、黃立琪老師之「護理人員工作滿意度量表」，於研究計畫名稱：Exploring the relationship between personality and job stress, burnout, satisfaction and resilience in Taiwanese cancer nurses 中，進行研究資料收集，並同意下列事項：

一、 在研究報告中註明出處。

二、 分享研究成果。

葉子珮
Yeh, Tzu-Pei (計畫主持人簽名)

姓名及名銜: Yeh, Tzu-Pei / PhD student of Nursing

服務機構: Faculty of Health and Social Care, University of Hull, UK

聯絡電話及地址: 0918-232913, +44-7428661285

No. 136, Jhang-lu Rd., Changhua City, Taiwan, 50083

問卷使用同意函

茲同意上述研究者使用「護理人員工作滿意度量表」進行資料收集，並祝祝研究順利圓滿成功。 In response to the request, permission is hereby granted to Miss Yeh, Tzu-Pei for using Nurses' Job Satisfaction Scale in her PhD research.

(簽名處)

2013 年 3 月 5 日

Appendix 3 Demographic Questionnaire

Part I: Personal information

Date of completing this questionnaire: _____ (DD)/_____(MM) /2013

Clinical ladders: ☐N0 ☐ N1 ☐ N2 ☐ N3 ☐ N4

Gender: ☐ Male ☐ Female

Actual age: _____years

Educational Level in Nursing :

☐ Diploma of Vocational High School of Nursing

☐ Diploma of Junior College ☐ Bachelor Degree ☐ Master Degree

☐ PhD Degree

Years of Experience in Cancer Nursing: _____ year(s)

Do you have nurses in the family: ☐ Yes ☐ No

Have you had family members with cancer ☐ Yes ☐ No

Have you completed the module of cancer nursing in school? ☐ Yes ☐ No

Have you completed the Oncology Nursing Training hold by Oncology Nursing Society of Taiwan? ☐ Yes ☐ No

Do you have license of Oncology Nurse? ☐ Yes ☐ No

How long do you intend to stay in nursing? _____year(s)

How long do you intend to stay in your present job? _____year(s)

If you are willing to accept face-to-face interview (there are 8 questions, the interview will take you approximately 30 minutes), please leave your contact

number and convenient contact time below. I will phone you and make an appointment for the interview. Or you can use the research student's contact information on the cover sheet to let me know. Many thanks!

Your name: _____

Contact number: _____

E-mail: _____

Convenient contact time: _____

Case number on information sheet: _____

Appendix 4 Questionnaire for Pilot Study

Dear Colleague:

Thank you for attending pilot study. The purpose of pilot study is to explore whether there is any confusing words or unclear meaning of cover sheet or in items of questionnaire. Please read the cover sheet and items in questionnaire carefully. After you completing the questionnaire, please answer the questions below. Thank you for your help to make the cover sheet and questionnaire perfect.

Is the content of cover sheet clear and easy to understand? □ Yes □ No

If your answer is 'No', please indicate which part of the cover sheet is unclear to you._____

_____

_____

Do you think there is important information that you would like to know lacking in the cover sheet? □ Yes □ No

If your answer is 'Yes', please indicate what information should be added to the cover sheet.

_____

_____

_____

Did you experience any difficulty while answering the items? □ Yes □ No

If your answer is 'Yes', please indicate the specific questionnaire and item. Also, please clarify why the item is hard for you to answer; for example: 'item 37 in personality questionnaire confused me and I am not sure the meaning.'

_____

_____

_____

If you have further thoughts or opinions on this research, please do not hesitate to give your advice and feedback below; any word from you is very precious and important to this research.

_____

_____

_____

Thank you for your time and opinions!

Appendix 5 Information Sheet

Dear colleague:

My name is Yeh Tzu-Pei and I'm a PhD student in nursing at the University of Hull, UK. I would like to invite you to participate in my research which aims to study the relationship between cancer nurses' personalities, job stress, burnout, satisfaction and resilience. Cancer nurses who offer direct clinical care to patients and work in wards are invited to participate.

This survey is composed of five independent questionnaires. It takes approximately 30 minutes to complete. Your participation is totally voluntary, anonymous and confidential. Your name will not appear on the questionnaires and the collected information will only be seen by me and my supervisors. If you have any question about this survey, please feel free to contact me. You have the right to withdraw from this research at any time without explanation. You can notify me of your withdrawal by using the number on this cover sheet (on the top right).

You are always welcome to contact with me for further information. There will be an incentive voucher for you if you are willing to participate in this research, complete and return the questionnaires. Please return the completed questionnaires to the head nurse by using the self-adhesive envelope within 7 days of receiving the questionnaires. Your participation or not will have no influence on the evaluation of your job performance.

All data will be used for academic purpose only; it will be stored safely, your anonymity is assured and it will not be shared with anyone other than me and my supervisors. By completing and returning the questionnaires, you are giving me authority to use the data for academic purposes. Your participation is crucial to this research, and the outcomes of this research will be used in establishing better policy in recruiting new nurses and maintaining experienced nurses. Please feel free to contact me if you have further questions. My contact information is stated

below. Thank you for your precious time and assistance.

Yours sincerely

Tzu Pei

____ (DD)/____ (MM)/ 2013

Supervisors: Professor Roger Watson (r.watson@hull.ac.uk)

Dr. Judith Dyson

Dr. Chang Li Lu

Research Student: Yeh Tzu Pei

Contact number: +886-918-232913 (Taiwan), +44-7428661285 (UK)

Contact Address: No. 136, Jhang-lu Rd., Changhua County, Taiwan, post code: 50083.

E-mail: gipsiisme@yahoo.com.tw

Appendix 6 Interview Guideline with Probing Questions

1. Could you tell me how your job makes you feel?

   Was cancer nursing your first choice?

   Do you like this job?

   What's your favourite part of your job?

   What emotional responses have you had to your job recently?

2. Could you tell me what the best parts of your job are?

   Could you give examples of what you feel you have achieved in your job?

   How long have you done this job?

   Can you tell me anything that impressed you about your job?

   Can you tell me any good thing that happened in your job?

   What most satisfies you about your job?

3. Could you tell me what the most stressful parts of your job are?

   Could you tell me the top three stressors in your job?

   Have you feel physically unwell recently?

   Can you tell me about times when you feel stressed?

   How often do you feel stressed?

   When have you felt of being completely exhausted? How often do you feel like this?

4. What are the most important factors making you stay in your job?

What are your expectations of this job?

5. What do you usually do when you go through difficult times of your work?

How often do you encounter difficulties in your job?

Tell me about some of the most difficult times in your job.

Have you ever wanted to give up this job?

How do you overcome difficulties or go through hard time?

6. Could you describe what sort of person you are?

Please use three adjectives to describe yourself?

7. How do your personal characteristics make you behave in your job?

In terms of the personal characteristics you mentioned, do they influence your job?

Does your personality affect your job performance?

8. What is your career plan in the future?

Do you have any plan or thought related to your job?

How long will you continue stay in this job?

The reason you stay in this job is?

Generic things to avoid ‘dries up’:

What would you change?

You mentioned earlier X, can you tell me a bit about that?

Tell me more about X

How do you feel about that?

How do that influence the way you feel about?

What would you wish to change about the work environment?

How/What would you do … if you were in charge?

Appendix 7 Reliability Reports of Selected Questionnaires

Scale: Neuroticism

Case Processing Summary

		N	%
Cases	Valid	397	96.6
	Excluded[a]	14	3.4
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.876	.877	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Neuroticism 1 R	33.26	51.417	.479	.312	.872
Neuroticism 2	32.49	49.569	.534	.336	.869
Neuroticism 3	32.38	48.145	.595	.393	.865
Neuroticism 4 R	32.72	49.461	.609	.484	.864
Neuroticism 5	32.04	50.905	.535	.324	.869
Neuroticism 6	33.10	48.165	.627	.430	.863
Neuroticism 7 R	32.60	49.654	.582	.433	.866
Neuroticism 8	32.66	50.350	.473	.255	.873
Neuroticism 9	32.27	49.888	.552	.391	.868
Neuroticism 10 R	32.55	48.566	.649	.542	.862
Neuroticism 11	32.79	49.146	.600	.392	.865
Neuroticism 12	32.90	48.511	.587	.404	.865

R means the reversed item.

Scale: Extraversion

Case Processing Summary

		N	%
Cases	Valid	395	96.1
	Excluded[a]	16	3.9
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.781	.788	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Extraversion 1	36.28	28.902	.441	.332	.764
Extraversion 2	35.71	29.533	.484	.371	.761
Extraversion 3 R	37.54	31.010	.277	.148	.779
Extraversion 4	36.04	28.513	.566	.383	.752
Extraversion 5	36.33	28.030	.522	.438	.755
Extraversion 6 R	36.35	28.228	.494	.304	.758
Extraversion 7	36.61	29.782	.382	.275	.770
Extraversion 8	36.14	28.677	.583	.509	.751
Extraversion 9 R	35.91	31.369	.254	.130	.781
Extraversion 10	36.31	31.373	.163	.062	.795
Extraversion 11	36.56	27.811	.613	.453	.746
Extraversion 12 R	36.49	28.890	.356	.172	.775

Scale: Openness to experience

Case Processing Summary

		N	%
Cases	Valid	395	96.1
	Excluded[a]	16	3.9
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.757	.761	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Openness to experience 1	38.57	26.033	.318	.183	.749
Openness to experience 2	38.09	26.298	.445	.307	.737
Openness to experience 3	38.29	24.964	.512	.341	.728
Openness to experience 4 R	38.62	26.419	.277	.096	.754
Openness to experience 5 R	39.03	24.753	.383	.275	.743
Openness to experience 6 R	38.82	26.522	.219	.106	.763
Openness to experience 7 R	38.59	25.969	.373	.177	.743
Openness to experience 8	38.13	27.734	.248	.121	.754
Openness to experience 9	38.56	24.029	.541	.409	.722
Openness to experience 10 R	38.71	24.035	.497	.291	.727
Openness to experience 11	38.83	25.637	.427	.265	.737
Openness to experience 12	39.07	24.208	.512	.314	.726

Scale: Agreeableness

Case Processing Summary

		N	%
Cases	Valid	396	96.4
	Excluded[a]	15	3.6
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.687	.682	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Agreeableness 1	38.89	21.387	.319	.238	.670
Agreeableness 2 R	39.82	18.733	.419	.297	.651
Agreeableness 3 R	39.74	19.525	.417	.242	.652
Agreeableness 4 R	39.88	20.684	.311	.166	.670
Agreeableness 5 R	40.20	22.965	.011	.052	.711
Agreeableness 6	39.36	20.475	.361	.227	.663
Agreeableness 7	39.39	20.917	.302	.246	.671
Agreeableness 8 R	39.41	19.285	.460	.269	.645
Agreeableness 9 R	39.37	20.878	.272	.119	.676
Agreeableness 10	39.16	21.687	.247	.222	.678
Agreeableness 11 R	39.81	20.611	.258	.123	.679
Agreeableness 12 R	39.47	18.498	.481	.316	.639

Scale: Conscientiousness

Case Processing Summary

		N	%
Cases	Valid	396	96.4
	Excluded[a]	15	3.6
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.777	.782	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Conscientiousness 1	39.81	22.701	.376	.157	.766
Conscientiousness 2	39.98	22.536	.437	.243	.760
Conscientiousness 3 R	40.38	21.756	.428	.236	.761
Conscientiousness 4	39.58	23.261	.390	.206	.765
Conscientiousness 5	40.32	21.580	.499	.292	.753
Conscientiousness 6 R	40.20	22.104	.379	.216	.766
Conscientiousness 7	39.68	23.756	.327	.208	.770
Conscientiousness 8	39.82	23.167	.402	.224	.764
Conscientiousness 9 R	40.66	21.087	.420	.233	.763
Conscientiousness10	40.08	21.505	.545	.334	.748
Conscientiousness 11 R	40.21	21.067	.496	.281	.753
Conscientiousness 12	40.66	22.109	.341	.172	.772

Scale: The Nurse Stress Checklist

Case Processing Summary

		N	%
Cases	Valid	388	94.4
	Excluded[a]	23	5.6
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.953	.955	47

Scale: The Nurse Stress Checklist - Work concern

Case Processing Summary

		N	%
Cases	Valid	403	98.1
	Excluded[a]	8	1.9
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.938	.940	13

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Work concerns 1	35.32	381.855	.596	.403	.938
Work concern 2	35.02	371.457	.707	.617	.934
Work concern 3	35.81	376.563	.804	.797	.931
Work concern 4	36.09	385.009	.730	.760	.933
Work concern 5	35.80	379.774	.738	.652	.933
Work concern 6	33.67	367.043	.738	.866	.933
Work concern 7	33.90	363.733	.761	.882	.932
Work concern 8	34.70	372.865	.760	.723	.932
Work concern 9	35.31	375.971	.757	.792	.932
Work concern 10	35.93	383.894	.742	.687	.933
Work concern 11	36.17	388.514	.703	.682	.934
Work concern 12	35.47	384.384	.609	.602	.937
Work concern 13	36.02	389.044	.657	.466	.935

Scale: The Nurse Stress Checklist - Personal responses

Case Processing Summary

		N	%
Cases	Valid	405	98.5
	Excluded[a]	6	1.5
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.926	.941	17

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Personal responses 1	62.07	848.123	.754	.744	.919
Personal responses 2	61.67	841.421	.775	.808	.919
Personal responses 3	61.48	863.849	.582	.502	.923
Personal responses 4	61.81	866.745	.553	.386	.924
Personal responses 5	61.14	859.776	.535	.441	.924
Personal responses 6	61.35	867.109	.514	.372	.925
Personal responses 7	61.78	849.081	.765	.682	.919
Personal responses 8	61.00	846.616	.742	.677	.920
Personal responses 9	61.28	830.500	.844	.798	.917
Personal responses 10	61.29	853.043	.614	.447	.922
Personal responses 11	60.62	852.419	.725	.633	.920
Personal responses 12	60.95	834.119	.814	.755	.918
Personal responses 13	60.51	852.726	.715	.665	.920
Personal responses 14	60.97	803.121	.412	.210	.941
Personal responses 15	61.16	865.114	.608	.443	.923
Personal responses 16	59.31	867.632	.683	.684	.921
Personal responses 17	59.66	849.323	.757	.732	.919

Scale: The Nurse Stress Checklist – Competency

Case Processing Summary

		N	%
Cases	Valid	399	97.1
	Excluded[a]	12	2.9
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.889	.892	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Competency 1 R	28.23	147.198	.621	.462	.879
Competency 2 R	29.37	149.469	.669	.590	.876
Competency 3 R	28.40	146.573	.577	.402	.882
Competency 4 R	29.68	149.429	.697	.559	.875
Competency 5 R	28.99	147.945	.575	.440	.882
Competency 6 R	29.15	148.430	.710	.623	.874
Competency 7 R	29.28	150.865	.570	.500	.882
Competency 8 R	28.70	151.013	.514	.382	.886
Competency 9 R	30.01	153.269	.599	.593	.880
Competency 10 R	29.69	150.651	.644	.616	.877
Competency 11 R	29.42	152.228	.590	.410	.880

Scale: The Nurse Stress Checklist - Incompleteness of personal arrangement

Case Processing Summary

		N	%
Cases	Valid	407	99.0
	Excluded[a]	4	1.0
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.848	.846	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Incompleteness of personal arrangement 1	21.33	85.364	.658	.488	.818
Incompleteness of personal arrangement 2	20.40	95.960	.549	.323	.838
Incompleteness of personal arrangement 3	22.01	79.702	.738	.669	.801
Incompleteness of personal arrangement 4	21.94	81.819	.733	.641	.802
Incompleteness of personal arrangement 5	21.49	92.600	.555	.356	.837
Incompleteness of personal arrangement 6	22.83	96.511	.556	.353	.837

Scale: Maslach's Burnout Inventory - Emotional exhaustion

Case Processing Summary

		N	%
Cases	Valid	396	96.4
	Excluded[a]	15	3.6
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.896	.898	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Emotional exhaustion 1	26.27	90.662	.763	.695	.876
Emotional exhaustion 2	25.74	92.876	.742	.677	.878
Emotional exhaustion 3	26.03	90.470	.776	.670	.875
Emotional exhaustion 4	27.17	89.987	.682	.508	.882
Emotional exhaustion 5	26.69	90.575	.700	.542	.881
Emotional exhaustion 6	27.73	96.542	.621	.419	.887
Emotional exhaustion 7	26.69	101.284	.328	.117	.911
Emotional exhaustion 8	27.62	93.147	.615	.447	.887
Emotional exhaustion 9	26.62	89.077	.753	.599	.876

Scale: Maslach's Burnout Inventory – Depersonalization

Case Processing Summary

		N	%
Cases	Valid	401	97.6
	Excluded[a]	10	2.4
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.811	.809	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Depersonalization 1	7.82	26.093	.589	.402	.777
Depersonalization 2	7.16	23.961	.752	.637	.724
Depersonalization 3	7.16	23.833	.658	.523	.755
Depersonalization 4	7.99	26.930	.649	.450	.761
Depersonalization 5	7.44	30.827	.364	.166	.836

Scale: Maslach's Burnout Inventory - Personal accomplishment

Case Processing Summary

		N	%
Cases	Valid	396	96.4
	Excluded[a]	15	3.6
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.837	.839	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Personal accomplishment 1	28.80	43.763	.548	.343	.822
Personal accomplishment 2	28.76	44.807	.407	.279	.837
Personal accomplishment 3	29.03	40.771	.569	.346	.818
Personal accomplishment 4	30.35	40.557	.499	.265	.829
Personal accomplishment 5	29.40	39.036	.659	.528	.805
Personal accomplishment 6	29.19	39.442	.686	.641	.802
Personal accomplishment 7	29.13	40.094	.679	.560	.804
Personal accomplishment 8	29.38	42.631	.511	.292	.825

Scale: Nurse's job satisfaction scale

Case Processing Summary

		N	%
Cases	Valid	390	94.9
	Excluded[a]	21	5.1
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.923	.925	19

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Job environment 1	58.73	95.581	.438	.429	.923
Job environment 2	58.40	95.588	.453	.487	.922
Job environment 3	58.36	93.006	.600	.584	.919
Human relationship 1	57.96	93.387	.604	.681	.919
Human relationship 2	58.15	94.418	.592	.557	.919
Human relationship 3	58.08	93.434	.590	.477	.919
Human relationship 4	58.00	93.283	.632	.743	.918
Human relationship 5	58.13	93.232	.653	.682	.918
Human relationship 6	58.12	92.672	.669	.630	.917
Human relationship 7	58.22	93.279	.671	.526	.917
Benefit and promotion 1	58.52	92.029	.642	.604	.918
Benefit and promotion 2	58.64	91.963	.673	.809	.917
Benefit and promotion 3	58.67	91.184	.705	.806	.916
Benefit and promotion 4	58.64	91.733	.708	.827	.916
Benefit and promotion 5	58.63	92.094	.721	.824	.916
Workload 1	59.11	92.098	.623	.571	.918
Workload 2	59.41	94.916	.425	.526	.923
Workload 3	59.58	96.641	.332	.329	.926
Overall satisfaction	58.68	91.865	.694	.576	.917

Scale: Nurse's job satisfaction scale - Job environment

Case Processing Summary

		N	%
Cases	Valid	396	96.4
	Excluded[a]	15	3.6
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.812	.812	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Job environment 1	6.82	2.282	.622	.387	.782
Job environment 2	6.48	2.220	.686	.477	.717
Job environment 3	6.45	2.167	.678	.468	.725

Scale: Nurse's job satisfaction scale - Human relationship

Case Processing Summary

		N	%
Cases	Valid	396	96.4
	Excluded[a]	15	3.6
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.911	.911	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Human relationship 1	21.98	14.136	.761	.656	.894
Human relationship 2	22.17	14.863	.701	.521	.901
Human relationship 3	22.09	14.604	.655	.447	.906
Human relationship 4	22.01	13.926	.827	.737	.887
Human relationship 5	22.15	14.216	.793	.674	.891
Human relationship 6	22.14	14.316	.739	.612	.897
Human relationship 7	22.24	15.130	.642	.458	.907

Scale: Nurse's job satisfaction scale - Benefit and promotion

Case Processing Summary

		N	%
Cases	Valid	395	96.1
	Excluded[a]	16	3.9
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.938	.939	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Benefit and promotion 1	12.55	9.248	.728	.560	.944
Benefit and promotion 2	12.67	8.815	.871	.797	.917
Benefit and promotion 3	12.69	8.762	.856	.790	.920
Benefit and promotion 4	12.66	8.935	.869	.817	.918
Benefit and promotion 5	12.66	9.181	.857	.814	.921

Scale: Nurse's job satisfaction scale – Workload

Case Processing Summary

		N	%
Cases	Valid	395	96.1
	Excluded[a]	16	3.9
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.749	.749	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Workload 1	4.57	2.641	.538	.368	.709
Workload 2	4.87	2.181	.705	.501	.506
Workload 3	5.04	2.648	.498	.302	.754

Scale: Resilience

Case Processing Summary

		N	%
Cases	Valid	395	96.1
	Excluded[a]	16	3.9
	Total	411	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.760	.759	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Resilience1	14.66	8.844	.649	.566	.685
Resilience2 R	15.83	10.454	.405	.208	.749
Resilience3	14.82	8.650	.613	.518	.693
Resilience4 R	15.04	9.493	.439	.249	.744
Resilience5	15.13	10.147	.398	.248	.751
Resilience6 R	15.02	9.396	.516	.308	.722

Appendix 8 Qualitative Results of Personality

The sums of raw score in each personality were re-coded into standard scores from 1 to 5; 1 meaning low presentation of that personality trait, 3 representing medium endorsement of certain personality that participants have, and 5 indicating high endorsement. All the meaningful codes were allocated into 2 categories – agree with the NEO-FFI-3 score and disagree.

Personality	Agree	Disagree
Neuroticism	***Case 2 (N=5)*** 'I like to take unnecessary pains to study an insignificant or insoluble problem (get into a dead end). I'm wordy. I'm pickier.' ***Case 6 (N=5)*** 'Relatively pessimistic. Introverted.' ***Case 19 (N=5)*** 'I am a very irritable person. … It is hard for me to accept other's criticism of me; I would think of this〔criticism〕over and over aging.… I don't allow myself to make any little mistake.'	***Case 27 (N=5)*** 'I'm very patient.' ***Case 29 (N=3)*** 'I'm a simple person. I don't think too much.'

Extraversion	***Case 1 (E=5)*** 'I feel I'm pretty optimistic.' ***Case 2 (E=4)*** 'I'm optimistic.' ***Case 11 (A=5)*** 'I can easily chat to people or make friends.' ***Case 15 (E=5)*** 'I am very optimistic. … I like to contact with people naturally…and help people.' ***Case 16 (E=5)*** 'I love to play and have fun. I like go hither and thither, I cannot keep still. … I'm vivid and outgoing.' ***Case 27 (E=5)*** 'I'm very lively.' ***Case 33 (E=5)*** 'I'm quite optimistic.' ***Case 34 (E=5)*** 'I'm easygoing. I'm leisure.' ***Case 28 (E=5)*** 'I'm warm〔to other people〕.'	

Agreeableness	***Case 11 (A=5)*** 'I can easily chat to people or make friends.' ***Case 12 (A=5)*** 'Very…easygoing.' ***Case 14 (A=4)*** 'Friendly.' ***Case 20 (A=5)*** 'I feel that I'm a very thoughtful person. … I think I'm very kind-hearted.' ***Case 21 (A=5)*** 'I'm thoughtful.' ***Case 27 (A=4)*** 'I think I'm kind and peaceful.' ***Case 28 (A=5)*** 'I like to help people…. I'm obliging. Kindhearted….In terms of work, as a member, I'm compliant.' ***Case 29 (A=5)*** 'I trust others very easily.' ***Case 31 (A=5)*** 'I make friend quite easily.' ***Case 34 (A=5)*** 'I'm very easygoing.' ***Case 35 (A=5)*** 'I'm good at helping people.'	***Case 22 (A=5)*** 'Sometimes I choose to be cold and detached.' ***Case 23 (A=4)*** 'Stubborn.'

Conscientiousness	***Case 2 (C=3)*** 'I'm conscientious in work, and dutiful.' ***Case 6 (C=5)*** 'I'm relatively careful. … I would think more for details.' ***Case 11 (C=4)*** 'I ask everything to be disciplined. And I more or less want everything to be perfect.' ***Case 14 (C=4)*** 'I would persist in some points that I really care …I'm practical.' ***Case 15 (C=5)*** 'I'm circumspect.' ***Case 19 (C=4)*** 'I'm a bit scrupulous and methodical of work. If I can do this, I want others to reach the same like me. Although I know it's difficult, but I hope they do their best as possible as they can. … I'm very careful and discreet.' ***Case 21 (C=5)*** 'I like to pursue perfect. I don't like to make mistakes. I am relatively circumspect.' ***Case 23 (C=4)*** 'I'm actively in caring patients.' ***Case 27 (C=4)*** 'I'm a perfectionist.' ***Case 32 (C=4)*** 'I am a perfectionist.' ***Case 33 (C=5)*** 'I'm considered to be a deliberate person.' ***Case 33 (C=5)*** 'I work in quite orderliness way.' ***Case 34 (C=3)*** 'I can do my work fast, without too many hesitating. Also, I don't take unnecessary pains to study an insignificant or insoluble problem. … Everyone knows that I'm not a slow worker.'	***Case 1 (C=5)*** 'If I really want to do one thing, I will complete it conscientiously and do my utmost. … I don't think a lot.' ***Case 29 (C=4)*** 'I'm not cautious enough.'

Appendix 9 Qualitative Results of Stress

Work concern	(a) Communication problems	***a-1 Case 12*** 'Some physicians are unable to communicate with, almost impossible. What they said was unchallengable and I can't ask what I would like to know…some residents or junior physicians… senior physicians usually do not 〔act like this〕…they respect nurses more.' ***a-2 Case 19*** 'Some colleagues can't accept other's suggestion, you might give out some opinions or thoughts … but they thought why did you tell me those? They felt that they did quite well and undoubtedly. So this became … I feel this is a kind of stress.' ***a-3 Case 14*** 'I felt that I took a very long time to learn how to communicate with patients' ***a-4 Case 19*** 'These years, some patients' types are changing; some of them or families are not such easy to take care.'
	(b)Psychological demands from patients and families	***b-1 Case 28*** 'Physicians already explained to them 〔= patients〕, but I didn't think they quite understand…then we 〔= nurses〕 tried to use simple and more understandable words to make families or patients to realise. 〔But because this was bad news〕 So, I didn't know how to describe…or pacify or comfort them…that let they can accept and relieve gradually.' b-2 Case35 'If patients were recurrent, they didn't have good mood for certain. I felt their attitude affected our mood sometimes. So, I feel this is toilsome part of nursing. … Sometimes you want to spend more time in talking to patients and showing consideration, but because your time didn't allow you. You might have other things to be busy with.'
	(c)Work overload	***Case 1***

		‘as well as interpersonal relationship…most of the time I get along with others well, but I’m afraid that I miss something or I didn’t do well 〔and leave the tasks〕to next shift and cause〔extra〕load for next shift’. ***Case 14*** ‘〔I felt stressed when〕I couldn’t get my duty finished’ ***Case 33*** ‘I really worry about myself cannot finish 〔daily〕 work…but I don’t want to leave my own work to others 〔=next shift〕’ ***Case 34*** ‘…time is chasing you, it seems that your never finish your work. When you just sat dawn, some families thought you were not busy at all; but they didn’t know that you just sat down 〔after busy〕. This is stress, and I think it is the main stress.’
	(d)Taking care critical patients	***Case 1*** ‘The most stressful situation was when patients in critical conditions…sometimes I was in flow team, when physicians asked me the data of patients but I sometimes couldn’t answer immediately, I really hate this. This is the greatest stress to me’ ***Case 14*** ‘Pressure is…from the condition of patients… Just worry about…sudden incidents’ ***Case 19*** ‘Of course I know no matter what I do it is impossible to let the patients discharge with recover to health, but this is a conflict in my mind. This is related to patients’ lives; for me, it is a huge stress in mental aspect. When patient’s heart beat reached 200 〔times a minute〕, I felt my heart beat followed to 200 as well.’ ***Case 30*** ‘Because the daily tasks are unexpected, I can’t arrange my time 〔of work〕.’

		Case 30 'The facilities of our ward are really poor. Even the most basic blood pressure monitors are insufficient, not every nurse is equipped one monitor. Then one ward only has two oxymeters. I couldn't know patients' condition well all the time and I had to went and back around the ward 〔to find monitors〕.' *Case 33* 'If I had blood transplantation patients…it would be more…you need to wear on and take off isolation gowns; because things you need to do increase, you feel more stressful and tight….When taking care patients with ventilator, or isolated, or complex dress change, I felt quite stressful.' *Case 34* 'Sometimes when patients' conditions changed, I would think what I should do now. If the resident is not so smart…but I am not smart as well, like I don't know how to judge blood gas data…then…what should we do now? You can't make a conclusion and so do I, but patients felt short of breath. He 〔=the resident〕must do something, but unfortunately he didn't; I felt extremely stressful….When a patient's condition became worse; you almost had to fix on bedside. It's impossible to leave, you might need to inject an ample of Epinephrine every 5 minutes…you were afraid of that you can't look after other patients'
	(e)Making mistakes	*Case 19* 'When I made mistakes, I felt hugely stressful.' *Case 31 (Emotional Exhaustion=1)* 'When I made some mistakes … or I felt I was in bad condition … I might lose some points when I cared patients. When I hand over my patients to the next shift, I could be criticised by senior nurse why I didn't notice those points. When I arrived home, I felt I was so disappointing and I felt really miserable. I should be better today than yesterday. On the instance, I felt … God … maybe I shouldn't stay here 〔to be a nurse〕, because I may harm others〔my patients〕.'

		Case 34 'I made mistakes a while ago, and I have been watched by my supervisor closely recent. In the fact, it is easier to make small errors when you under stress; in this time, I feel very stressful. I know it's my fault, but you really don't know why you keep making mistakes. Especially you are in bad luck and feel low.' *Case 34* 'While you are doing one thing, there are many families stare at you….If you obviously knew the physician's order was wrong, and families doubted about it; but physician did not willing to face families and give explanation, you could only be a middleman and felt lacking in confidence. You felt any explanation was feeble, and you felt annoyed; just felt very stressful. And you didn't know what to do; because if you ask physicians or residents, they would think why you question me.'
Personal responses	(f) Insomnia	*Case 2* 'I am not sure if it is because I changed the shift from night to day, I feel dizzy when I am working.' *Case 6* '…unwilling to go out on holidays… just want to stay at home and sleep, that's all… I'm not in the mood to go out…' *Case 15* 'Sometimes I couldn't sleep well, but I didn't have any thought in my mind. But occasionally, the day before work day, I couldn't sleep well.' *Case 20* 'when I were home after work, I would recall from the first bed to the final every day; to think how was my patients' condition today, was there anything I missed when I handed over my shift to next. Sometimes I felt really tired, but because I was thinking my work procedures, I couldn't fall asleep.' *Case 33*

		'Transferring from day shift to night shift; I had sleeping disturbance. And during the night shift, I had menstrual disorder.'
	(g) Somatic syndrome	***g-1 Case 3*** 'I feel my physical strength was worse when I was in night shift; I got tired very easily, and like me, I slept most of the day when I was on holiday. I feel I have no quality of life at all.' ***g-1 Case 19*** 'In my first year, I was young then…so I had one year night shift without withdraw. I felt proficient in work…and I have no problem in sleeping. I felt good, but I started have depression, so I left my job after the whole year night shift.' ***g-1 Case 20*** 'I feel sore in shoulders and pain in back; and I am not sure if it's because I am in night shift, I feel I'm so tired so sometimes I was not too willing to talk.' ***g-1 Case 23*** 'In the past, I didn't have migraine, but after…as a matter of fact（my job）dose influence…' ***g-1 Case 27*** 'Changing shift just made me sleepy, when I was in night shift I felt very sleepy but I can't sleep. Sore shoulders and back pain are most common, the second sever effect is on intestines and stomach. Flatulence usually happened in the morning because intestines lacked of peristalsis; this is really uncomfortable. Many colleagues also have this problem, as long as they were in night shifts, they had constipation. Then, oedema, oedema of legs is severe. I have oedema just recent years ... I never had these symptoms when I was young; but as my age is elder … I feel harder and harder for me to work in night shifts. I almost fallen into severe tired.'

		g-1 Case 30 'I think I have alopecia, I feel aching of my stomach and intestine uncomfortable quite easily…especially stomachache, because I didn't have meals on time…and acne …' *g-1 Case 34* '…menstrual disorder…and getting UTI (Urinary Tract Infection) easily or vagina infection…I felt my sleeping patterns became bad…now, I feel tired very easily…' *g-1 Case 35* 'For example, if I have to work tomorrow, I can't sleep well tonight. I feel a little bit nervous….And headache, I don't know if this because the long working hours – 12 hours, um…when I had 8 hours shifts, it didn't happen…and I asked other colleagues, they also have this situation…low back pain, constipation…because I merely had no rest time during my 12 hours shift… usually choose day shift, because my sleeping quality was bad when I was in night shift. Also,〔during the night shift〕I couldn't company my family when I was off; I could sleep all day during vacation.' *g-2 Case 27* 'When my colleagues don't have unspoken consensus with me or to say, our working ideas and values are different … and they can't support me, on the contrary, I felt I was challenged and I've been watched whatever I did. I would feel very hard and unhappy, and then, some somatic symptoms would appear, like taut, stomach, poor appetite and upset.'
Competency	(h) Accounting situations never met before	*Case 14* '〔the stress comes from〕I think my ability in each aspect…〔especially〕 I felt that I took a very long time to learn how to communicate with patients… I often don't know how to express an idea appropriately.' *Case 29*

		'He 〔the patient〕already signed DNR (Do not resuscitate), his heart beat slowed down and then his heart arrested. At the moment, the families seemed…seemed to regret the DNR, then we continued to ask them if they were sure that they want DNR; we were ready to do CPR (Cardiopulmonary resuscitation) if they were not sure. This is the moment made us feel a little bit…didn't know how to do.'
Other stress dimensions not included in NJSS	(i)Looking patients suffering or dying	*Case 11* 'When you found patients were in the dying stage and their families asked some questions, I feel it causes stress to me. To be frankly, I don't want to face this in my mind. But when the families asked you, it's impossible that you didn't answer at all. Also, you need to face patient's death; you have to do body care. But I really don't like this aspect.'
	(j)Being new nurse stage	*Case 5* 'Because I just worked independently at that time, so … there must be lots of things to do… endlessly. Then I couldn't finish them, and the mentor also required a lot. At that time the mentor was very strict with me, making me feel dispirited. At that time I felt that the mentor was horrible, frightening, but after that I felt that I should thank her.' *Case 6* 'When I just came here, at that time…I was drilled severely. Then I couldn't sleep well every day, only slept for a very short time every day….I still don't want to go back the time of being a new nurse. I still think, I was unfairly treated in many aspects at that time. … I would remind myself of that I shouldn't treat juniors in that way in the future …' *Case 22* 'When you just enter a new workplace, many things would be hard; no matter work shifts, facing the changes of patients' conditions or how to respond or reply families … you had so many things to learn. And you got into a specialist area, in student times there was no differentiation but general knowledge; then you

		got into workplace and were arranged in one specialist area. So I felt quite hard at that time.' *Case 33* 'I felt that I could adjust at all when I just arrived. It could be I was too serious to everything and I put everything in my mind. When others had some emotional responses; I might be introjective and felt it was my fault.' *Case 35* 'The hardest time … probably in the beginning. In the start of work, you had to get familiar with colleagues and environment. Usually there were 3 to 4 new nurses recruited into a unit; you would be afraid of not catching up with others. I felt stressful on that time.'
	(k) Taking over shift from new nurse	*Case 3* 'There are more new nurses at present, so I feel when I was working … I couldn't finish my own work but I had to keep my eyes on new nurses', so many things to do. Nowadays new nurses couldn't be blamed; we need to teach them patiently. But it is hard for me to control my temper due to the extremely busy work. … They didn't check book about what happened on the day … you may explain one thing 10 times or even 20 times, but they still stayed the same. I would feel they didn't work attentively.' *Case 33* 'Sometimes new nurses couldn't finish their work on time or they show unconcerned attitude about work, I would had negative emotional response.' *Case 34* 'Some senior nurses are really tricky; they would doubt or criticise you. Before shift exchange you already had a long working day; so that before you took over your patients to them, you felt even more stressful.'

Appendix 10 Qualitative Results of Burnout

Emotional Exhaustion	(a)	***Case 6 (Emotional Exhaustion=3)*** 'because patients stayed for a long time whenever they were hospitalized, then I felt…felt vexed to see them every day… very upset… to see the same people…for this emotional reaction recently, on top of the first point you just mention, that is, taking against patients…keep thinking to quit, because I feel so tired.' ***Case 11*** 'I feel that I have severe occupational burnout, in caring patients, to families, or carrying out nursing skills; I feel…very tired. I'm very tired in my mind. Before, I might smile when I talking, but now I feel really lacking energy. I'm not too willing to talk, and I feel that I do this job blindly.'
	(b)	***Case 15 (Emotional Exhaustion=3)*** 'I am in this situation very often, namely separating between loved ones in life or death or 〔 patients'〕pain. Actually, sometimes I felt that I was in bad mood. … I don't know how to describe it, but…I am unavoidable to be affected. … Like, when you feel physically uncomfortable or have bad mood; if you run into such environment, you possibly can't be happy. For example, when you had bad mood, you might need someone who was happy to support you; however, the 〔work〕 environment you were is unhappy…so you would feel why this work environment is such sad. I am not unwilling to face it, but sometimes I considered if I need to change my job.' ***Case 19 (Emotional Exhaustion=3)*** 'Every day when I just arrive the hospital, my colleagues say to me why you look in good spirit and very happy; because every morning say hello to everyone joyfully. It feels like I am full of energetic; but in fact, you didn't see when I was coming in, I had to take a deep breath. I didn't want to come to the hospital to work. When I came in, I felt there was a huge pressure; so I had to take a deep breath before I went through the door. I felt exhausted when I started to work, I felt I had been looking forward to the evening ...I came to work on 7:30 in the morning, but I would think why it is not 7:30 in the evening. In the beginning of work, I still had some expectation for getting off duty. But in the middle of work, you kept walking and walking; I felt … I felt as if my body had almost collapsed; but I just squeezed a little energy, and then went to face my patient. After three days course,

		I lost all of my energy.'
	(c)	*Case 28 (Emotional Exhaustion=2)* 'Sometimes they felt we reproved them, but we just wanted to teach them something.' *Case 34 (Emotional Exhaustion=3)* 'One day, I felt very depressed … and I thought of that scene 〔patients died〕, I cried again. Although it's already one year ago … but it's hard to say. At that moment, I really felt … the salary was not much, but why should I be such tired.'
Depersonalization	(d)	*Case 6 (Depersonalization =2)* 'I feel quite okay this month. I am in flow team this month. If I am assigned to the flow team, and think … I am happy again, because I don't need to see the same patients and their families.' *Case 14 (Depersonalization =1)* 'I just couldn't…at that time maybe something happened to the patients … but I didn't care … yes; I couldn't feel sympathy for them or something. I just fully focused on myself. Just thought … I had to complete the medicine dispatch and then I would continue something else. And colleague might need help, need assistance, I might be … not that enthusiastic to help them…just finished my duty. That's all.' *Case 20 (Depersonalization =2)* 'I feel … I may get used to it〔my job〕. In the beginning of my work just after graduation, when I saw patients suffered from pain, I would feel … wow, it looked really painful, very uncomfortable. But a few years later, the feeling … you still feel empathy for patients, but without too much affection. This is the biggest different.' *Case 23 (Depersonalization =1)* 'I would think patients' leave〔death〕in more rational way. Also, I feel I shouldn't devote too much affection, um … it needs to be discriminated.' *Case 34 (Depersonalization =1)* 'Most of patients can't be complete cured. If you take care a patient for a long time and have affection toward the patient, you

		may see the patient withered gradually; it's really sad. When I was a new nurse, I would establish good relationship with patients, but I try to avoid this now as I can. Because I feel … it's too sorrowful to see they leave〔= dead〕. When you have affection with patients, sometimes you found that they got familiar with you because they want more from you; but those requests were actually over our limits of function and power, therefore we were in a dilemma. I don't like that feeling, so I could be very sociable with them, but I don't want to be so close to patients.'
Personal Accomplishment	(e)	*Case 2 (Personal Accomplishment =3)* 'Helping patients to complete their treatment smoothly and go home, or be well followed in outpatient service; they would thank us for helping them a lot under our caring. No matter when they discharged, or admitted to hospital, we can resolve their problems immediately; so they appreciated us. … When junior nurses thought I can achieve something they can't, I felt that's fulfillment too.' *Case 3 (Personal Accomplishment =2)* 'When I saw patients discharged happily and said goodbye to me, I felt in a good mood.' *Case 5 (Personal Accomplishment =3)* 'Of course I think…I personally enjoy the time when my patients say thank you to me when they are discharged from hospital and when they remember me at their next visit…I think…as long as patients are able to be discharged from hospital that is a good thing for me. Yes … as long as they are discharged from hospital, and then say thank you happily. That is…wonderful.' *Case 6 (Personal Accomplishment =2)* 'You can receive…I mean patients can gradually accept their condition from a very upset or depressed, and can be discharged. …. patients who had their first chemotherapy, and then I would explain more for them, they would very… they would give much more feedback to you...say thanks to us for explaining carefully to them, and give them confidence not to be so afraid; which makes me feel fulfilled.' *Case 12 (Personal Accomplishment =2)* 'In terms of taking care of patients, you could anticipate what will happen to them and told them in advance. After, patients

		confirmed with you what you said was so right; I obtained part of fulfillment from this. … I think it〔= nursing〕 allows me to learn a lot of things, including communication. Communication was one of my weaknesses before; I don't know how to communicate with people, especially with families. Up to now, I feel I have progressed a lot; I think it may because I'm more familiar to this job, and my knowledge increasing, therefore my ability of communication improved.' *Case 14 (Personal Accomplishment =1)* 'I think…taking care of patients, making them feel better… I mean you see the good results. For example, you may teach them to leave the bed and take a walk, which can speed up…recovery after operation. Then you would feel you've done something that really helped them. … You made efforts and they got the good results…. for example, providing information for patients … because this is what we know. People will be...afraid of knowing nothing when they fall ill, or many of them become very quiet. If you notice it, and as you cumulate … you have the ability to tell them accurate information, then they feel comfortable, that is a kind of fulfillment. It's about the meaning of your existence to them and their trust on you. I think.' *Case 15 (Personal Accomplishment =2)* 'I think getting alone with patient well … having compliments from patients.' *Case 16 (Personal Accomplishment =1)* 'Seeing them been cured and discharged made me feel much fulfilled. In surgery ward, the big challenge is how you help patients to move and get off bad. … When you know how to deal with patients' condition change, like the color change inside drainage tubes or bleeding; in the beginning you feel afraid, but as time goes by, you saw how other nurses dealt with this situation and you tried to deal with it independently, then you can feel yourself have been different. I think that's the fulfillment accumulated from work experience.' *Case 20 (Personal Accomplishment =2)* 'I think I still prefer to stay in clinical care, sometime patients' feedbacks made me happy all day. … I usually work in night shifts, sometimes I found some situations of patients and dealt with those problems〔in time〕without delays until the situation got worse; I feel much fulfilled as well.'

		Case 27 (Personal Accomplishment =3) 'I really enjoy interacting with patients. When they first arrived, they didn't understand their disease very well and they don't have idea about what they need to face in the future. What made me feel the most fulfilled was accompany patients; from they didn't know anything and worried, until they finally understood how to live better with their disease in the future. Then I could feel we achieved consensus, and they learnt and grew. Then they were willing to face their disease. I feel much fulfilled in this moment. When I helped patient to understand that he was dying, and he can say goodbye to medical staffs and families, I felt very touched.' *Case 28 (Stress: 1.28, EE: 2, DE: 1, Job Satisfaction: 3.42)* 'My mother was diagnosed〔with cancer〕last year, and I happened to work in this ward then. Therefore, when faced this disease compared to other specialist areas, it might be easier for me to know how to care my parent with cancer. Because I got contact with cancer patients frequently, so I know what's could be her worry in mind and concern about uncomfortable; this might be gains of coming this ward.' *Case 29 (Personal Accomplishment =2)* 'Our patients are in terminal stage, I felt our roles are different. We don't try to cure them, instead, we help them to prepare a peaceful environment … at least minimise their pain in these last days. I think this is very meaningful. When patients can't prolong their lives, they can choose a more dignity way to leave. I think this is what I've learnt the most in this ward and the best part of my job. I feel that I can bring nursing into full play, not just dispatch or inject medicines. … I'd ever accompanied an old man entire process of passing away, from poor condition to expiring. He didn't have any family, when he was dying, I went to bedside and said goodbye to him; he couldn't speak at that time, but he hold my hand when he heard my voice. I'll never forget this, I can do my job like this and as a matter of fact; there was someone who really felt my concern and caring. This was a very touched experience.' *Case 30 (Personal Accomplishment =3)* 'Once a time, I was really busy, but I still squeeze some time to help families. I told families the dying signs, and help the

		families prepared well for patient's dead. … The patient pass away in peace and families were peaceful, I felt all my tiredness was very worthy.' *Case 31 (Personal Accomplishment =1)* 'When they〔= the patients〕gave me smiles or said 'thank you' to me, I could be very happy and the happy could persist all day.' *Case 35 (Personal Accomplishment =3)* 'The characteristic of our ward is caring patients in terminal stage. That is giving mental support to families, and making them warm; or to say, we not only care patients, but also care family's needs. Other example, when my friends or relatives have illness in cancer, they would consult me because they know I'm working in a cancer hospital. I'd ever cared a palliative patient, the families called me at ward for acknowledgment after the patient dead. One of the families even came back to hospital and thanked us. I feel except completing my duty work, I can help people; I quite like this feeling.'

Appendix 11 Qualitative Results of Themes which Reflected the Significant Relationships in Questionnaire Survey Results

(a) Hospital Attribution	*Case 14 (Private cancer centre)* 'I just felt that the philosophy and the system of the centre attracted me a lot. So I came to have a try.' *Case 35 (Private cancer centre)* 'I like the environment here; I decided to stay this hospital after I had internship here. I felt the environment is safer, not like other hospitals have very complex patients.
(b)	*Case 22* 'My colleagues felt stressful sometimes when they working with me, because I would ask for speed and accuracy.'
(c)	*Case 23* 'I'm very conscientious and careful in work … I don't allow the patients to refuse〔treatment or nursing action〕. I would consider more, because this is related to human lives. Therefore, in some aspects, not the patients' words count.'
(d)	*Case 2* 'When patients felt depressed, I can give a bit …my support, and a bit distraction to make them a little happier. … Among colleagues, when we were really busy, I might say something funny.'

Appendix 12 Qualitative Results of Other Themes

(a) Thought about life and death	*Case 5* 'Because of this disease…many patients will pass away afterwards, So I feel when people face death, for example, my family's members, when they face this thing, they are still very scared. But for me, I feel okay. Not a big deal in fact. That is what life is all about. On the contrary, my family's members would think, it seems that…they are still very concerned about and afraid of this thing. I mean facing death and seeing people who passed away. I think I can face separation in life and death earlier, then, it makes me fear nothing from cancer patients.' *Case 6* 'For death, I seem not to be so afraid of seeing people passing away. Because in the case that a patient expired, and requires some nursing care, I would push his/her family to do for him/her, to dress him/her up and talk to him/her. Then I found that in fact, most of people dare not to touch, just keep crying and dare not to touch their family. I would think that seems to be a bit of regret in the future. … Life is something you can't tell … and enjoy pleasure in good time, make merry while you can, and be filial to parents, seize the moment.'
(b) Turnover reasons	*Case 3* 'When I had frustration and felt depressed after came home, I wanted to quit or change job.' *Case 5* 'In the first and second year after I stared to work, I was seriously tired of my job.' *Case 6* 'I keep thinking to quit, because I feel so tired. Physically tired, sometimes mentally tired as well. If I was very very busy… then sometimes I would think… since this work is crazy, and the environment now is so bad…it doesn't matter if I quit, because this is not what I think about nursing.' *Case 12* 'If I can't have vacation, I may like to quite. I must rest, I need to have 3 or 4 days to do what I want to do at once a month; like travelling. I can't continuously work for a long time, because this work related to highly critical; if I didn't have a rest otherwise I got weary very easily.'

	Case 14 'When I was a new nurse … around a year, I thought of giving up this job. … I made some mistakes in my job … then…I think that was escapism. Just felt that...since I was incompetent in my work, I…had batter simply quit.' ***Case 23*** 'Serious delay of getting off duty.' ***Case 29*** 'Just in the beginning, the first three months. Because I felt that I can't catch up.' ***Case 34*** 'When you were very tired, you really want to give up. Then, when you went through the low tide, you would feel it's alright. But when you made many mistakes or had no feeling of achievement … you would think to leave this job.' ***Case 35*** 'When I was new nurse … I felt this job requires physical strength; as my age becomes elder, I'm wondering if I can continue doing this job.' ***Case 11*** 'I would get married afterwards, that's impossible for me to have shift work. So I may change my job into outpatient services or documentary work.' ***Case 33*** 'I would like to change my area into community nursing if I have a family.'
(c) Coping	***Case 14*** 'I sometimes ignore trifles … I would try to verbally communicate as far as I can. If verbal communication is impractical, sometimes I would write mails…cope with it when calming down…Mostly I would appeal to peers, to share, appeal to some close colleagues.' ***Case 34*** 'When I took off, I would force myself to go out such as window shopping. If I wanted to calm, I would go to museum or art museum; I just didn't want to stay at home. Even want out for walking or doing some exercise, I felt better. If I stayed at home all day, then go to

	work; I felt not quite happy.'
(d) Intention to stay	*Case 3* 'I do not like or dislike my work, I feel this is just a job. If you go somewhere because you don't like this job, you don't necessarily like the new job. Every job has its good side and bad side, but I can accept both. … The head nurse would give me holidays for travelling abroad; this is the other reason that I can accept and am willing to stay in this job. In fact, no matter which place you work in, it must be very tired.' *Case 23* 'I have used to this work environment … I am familiar with this job and I work with people who I know well, so I don't want to leave easily.' *Case 29* 'The main reason of doing this job is because I feel this job is very interesting. … Of course learning is stressful, and this job is very busy, also I was very tired after going home. But sometimes I think the mental maturity benefit me. So this is the reason I like this job all the time, and I never thought of changing job.'