

**Would you like something to help you sleep?  
Stress, Sleep, and Personality in Irish Nursing**

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### Declaration Page

'I declare that this thesis that I have submitted to Dublin Business School for the award of HDip Psychology is the result of my own investigations, except where otherwise stated, where it is clearly acknowledged by references. Furthermore, this work has not been submitted for any other degree.'

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Signed: Michael Gorman Mc Nicholas

Date: 20th March 2020

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## Abstract

The WHO has identified an impending global shortfall of 9 million nursing staff within the next decade. This research aims to investigate stress in the nursing profession with the intention of informing retention focused interventions in the nursing sector. Online surveys containing measures dealing with stress, sleep and personality were distributed via social media. A total of 362 valid responses were obtained. There was a significant relationship between stress and sleep which was mediated, in part, by respondents scores on a brief neuroticism scale. Future nursing retention interventions should focus on sleep hygiene and, ideally, would be personological catered for nurses at higher risk of turnover.

## Introduction

The global population is aging and globalisation is exacerbating the spread of communicable diseases (Nkowane, & Ferguson, 2016). As such, there is a current estimated deficit of 9 million nursing staff world wide which is predicted to worsen in the coming decade (Nkowane, & Ferguson, 2016). In response to this looming deficit, and to mark the 200th birthday of Florence Nightingale, the World Health Organisation has dedicated 2020 as *The Year of the Nurse and Midwife*. This entails an awareness and appreciation campaign designed to highlight the positive aspects of nursing and to tackle some of the issues and obstacles that affect nurses in the modern world.

Nurses are a high risk group for insufficient sleep and chronic stress (García-Izquierdo & Ríos-Risquez, 2012; Bautista, Lauria, Contreras, Maranion, Villanueva, Sumaguingsing, & Abeleda, 2019). Insufficient sleep predisposes nurses to fatigue related “medical errors, degradation in performance, decreased mental acuity, and social problems” (Kunert, King, & Kolkhorst, 2007, p.2). When an individual's sleep is disturbed or restricted on a regular basis they are at risk of developing metabolic issues, heart disease, depression and anxiety, and a spate of other diseases and disorders (Theorell, Åkerstedt, 1976; Guglielmi, Magnavita, & Garbarino, 2018; Boggild, Knutsson, 1999; Taylor, Pocock, 1972).

Although some recent research has illuminated the role that individual differences play in mediating the effects of environmental stress (Kennedy et al., 2014; Myhren et al., 2013; Sahi & Raghavi, 2016), it is apparent that chronic stress in the nursing profession may be affecting nurses' health, their relationships, and their ability to function effectively in a hospital setting. Chronic stress and insufficient sleep may ultimately be contributing factors in avoidable patient mortality.

Therefore, this thesis will aim to investigate the relationship between frequency of stressful events reported, amount and quality of sleep reported, and the mediating effects of personological factors in a population of Irish nurses. In addition, a number of organisational and demographic variables will be investigated that may relate to stress and sleep in the nursing profession.

## *Literature Review*

### *Stress*

#### *Physiological Stress.*

Perceived environmental stressors instigate a move away from homeostasis known as the fight or flight response. This state of readiness interrupts non-essential gastrointestinal processes, heightens blood pressure, dilates pupils, and suppresses immune responses (Barnes, 2013). When a perceived threat or challenge does not resolve itself and remains a perceived threat or challenge for long periods of time the body fails to return to its point of stasis. This can lead to degradation of the hippocampal structures that facilitate the feedback loops responsible for the extinction of stress responses, can cause arterial damage, can result in a compromised immune system, and can block production of melatonin and other sleep related hormones (Carlson, 2016). Nurses operate, on a daily basis, in some of the most extreme emotional environments imaginable while also managing the organisational and interpersonal stressors inherent in any modern workplace.

#### *Stress in the Nursing Profession.*

The complex nature of stress in the nursing profession becomes even more problematic when the various subdivisions within nursing are considered. Jathanna, Latha, & Prabhu (2012) cross-sectional analysis of 339 nurses operating within a super speciality hospital in Kerala, India highlights the complexities of stress in the nursing profession. The researchers surveyed subjective stress levels at an intra-organizational level using the expanded version of the Nursing stress scale (French, Lenton, Walters, & Eyles, 2000). Nurses who had been employed less than 1 year reported workload as the most prominent stressor. Operating theatre nurses and emergency unit nurses rated interpersonal conflicts as the most salient causes of stress. Whereas this cohort of ICU nurses found feeling inadequately prepared to deal with the emotional needs of the patient or the patient's family as being the most stressful aspect of their work. Additionally, the researchers reported a significant association between youth and self report stress. This indicates either learned coping skills in the older population or, perhaps, a significant confounding effect of survivor bias whereby stress prone nurses are not retained

Wareth & Eltaybani (2019) found a similar relationship between inexperience and stress. A cohort of 100 ICU nurses were surveyed during their first 6 months of employment using the original NSS. Among those studied, 43% reported moderate stress and 57% reported high stress

(Wareth & Eltaybani, 2019). Both sex and marital status acted as moderately mediating factors in relation to reported stress (Wareth & Eltaybani, 2019), however these effects were not statistically significant. In this particular cohort of novice ICU attendants, “death and dying” and “inadequate preparation” were reported as the most frequent sources of stress (Wareth & Eltaybani, 2019).

The spectrum of salient stressors found to be problematic in nursing are unique. Bautista et al.’s (2019) study highlights organisational, existential, and social distress in a cohort of general nurses (n=427) employed in a tertiary hospital in Manila, Philippines. This research team also used the original NSS (Gray-Toft & Anderson, 1981). Workload was the most frequent source of stress (mean = 1.70, SD = .71, range = 1-4), with patient suffering being the second most frequent stressor (mean = 1.35, SD = .70, range = 1-4) and lack of support the third (mean = 1.02, SD = .72, range = 1-4). The rest of the possible stressors were scored with a mean less than 1.0.

#### *Measuring stress in Nursing.*

Measures of stress in the nursing profession have provided numerous different factor loadings. Each investigation appears to be influenced by the respondents unique stressors and the organizational context in which the study has been conducted (Garcia-Izquierdo & Rios-Risquez, 2012). Gray-Toft & Anderson (1981) produced the original measure of nursing stress with a seven factor structure (1981). French et al. (2000) proposed a 9 factor scale which reflected the modern workplace more accurately by including an additional factor for discrimination and by regrouping certain items to obtain higher internal validity. Lee, Holzemer, & Faucett (2007) created a modified scale with evolved factor loadings which also operated using a similar 7 factor measure to the original. Most recently, García-Izquierdo & Ríos-Risquez (2012) refined the original NSS into a reduced 24 item, five factor measurement with comparable psychometric validity to the original. Ultimately, it appears that the nursing profession is so heavily influenced by the availability of resources and also by the local organisational culture that the idea of a cross cultural, “one size fits all” measure may be untenable.

That being said, the original Gray-Toft & Anderson (1981) scale has been applied in hundreds of different studies and, despite its slightly dated nature, is still a useful measure of stress in a modern nursing context.

### *Sleep*

Hirshkowitz, Whiton, Albert, Alessi, Bruni, DonCarlos, & Neubauer (2015) published their findings arising from The National Sleep Foundation's 18-member multidisciplinary expert panel on recommended sleep parameters. They ultimately concluded that for adults and young adults 7-9 hours sleep was optimal. Any individuals sleeping outside of this range may be exhibiting symptoms of a sleep disorder such as insomnia, hypersomnia, or idiopathic hypersomnia; or a disruptive medical condition such as menopause, nocturia, or sleep apnea. Hirshkowitz et al. (2015) concluded by saying that individuals deviating from the recommended range of their own volition they may be sacrificing their long term mental and physical well-being (Hirshkowitz et al., 2015).

### *Sleep, Gender, and Age.*

In Grandner, Martin, Patel, Jackson, Gehrman, Pien, & Gooneratne (2012) investigation of sleep disturbance across the life span ( $n = > 155,000$  participants) a nonlinear bimodal distribution emerged. The highest rates of self-reported sleep disturbance were found for those men and women in the young (ages 18–24) and midlife (ages 50–59) categories. Naturally, this distribution affects any investigation of sleep habits in a working population. However, the general trend in Grandner et al.'s (2012) data seemed to indicate that sleep disturbances are actually reduced as a function of age and subjective reports of sleep disturbance and tiredness in aging communities is not actually due to physiological maturation, but rather is due to skewed perceptions of fatigue or a proclivity to verbalise distress.

Alternatively, sleep disturbance is also often an expression of unsatisfactory environmental conditions. A representative sample of the Canadian population was studied as part of the Canadian Community Health Survey. Garland, Rowe, Repa, Fowler, Zhou, & Grandner (2018) employed a pseudo cross-sectional design, deriving cohorts from the 2000–2002 sample ( $n = 34,118$ ) sample and the 2011–2012 sample ( $n = 23,089$ ). The data showed an overall increase in the rate of insomnia symptomatology during the 10 year interval, however, the measurement methodology was limited, the study relied upon a single item, self report measure. The increase in prevalence was modest, only amounting to 1.5%. Although, the internal data shows that this increase was primarily driven by women in the 40-59 age range, Garland et

al. (2018) propose the recent cessation of hormonal treatment for menopause, due to its possible carcinogenic effects, as a possible factor in the increasing rates of insomnia symptoms among the 4-59 year range. Menopause related sleep disturbance may actually account for a significant proportion of the bi-modal distribution in sleep disturbance as a function of age which was evidenced in Grandner et al.'s (2012) data. As of December 2019, the nursing workforce in Ireland totaled 67,083 activneurses, of which 91.33% were female (f=61,266) and 83.67% were male (m=5,816). Again, this is pertinent information for any investigation of sleeping habits in a modern workforce, especially one that is so heavily populated by female workers.

As people age there are often health related concerns which affect their ability to obtain restful sleep. Menopause is an often cited confounding factor in female sleep studies (Lee, 2009), causing disturbances of circadian rhythms and affecting sleep quality. The same is true for nocturia (frequent bathroom usage during the night) in male populations (Lee, 2009). Sleep difficulties among younger adults may be due in part to discordant sleep hygiene. Gradner et al (2012, p. 404) cite “phase delay” as a result of residual “adolescent sleep patterns” which conflict with wake schedules as young adults enter the workforce or move on to third level education.

#### *Deficient Sleep.*

A deficit of restorative sleep, for any reason, is still detrimental to the health and well being of the deprived individual.

“Insufficient sleep leads to the derailment of body systems, leading to increased incidences of cardiovascular morbidity, increased chances of diabetes mellitus, obesity, derailment of cognitive functions, vehicular accidents, and increased accidents at workplaces.”

(Chattu, Manzar, Kumary, Burman, Spence, & Pandi-Perumal, 2019, p. 2).

There is evidence linking restricted sleep to increased rates of cancer (Taylor, Pocock, 1972), gastro-intestinal problems (Scott, LaDou, 1994), cardio-vascular disease (Boggild, Knutsson, 1999), metabolic issues such as diabetes (Theorell, Åkerstedt, 1976). Additionally, disturbed or restricted sleep in expectant mothers is associated with low birth weight and infant

health outcomes (MacDonald, McDonald, Armstrong, Cherry, Nolin, Robert, 1988; Gerber, Hartmann, Brand, Holsboer-Trachsler, & Pühse, 2010). In addition to higher instances of physiological malady, psychological well-being is also affected by chronically deficient sleep. Sufferers are at higher risk of developing depression, anxiety, and general psychological distress (Guglielmi, Magnavita, & Garbarino, 2018).

### *Sleep and Emotion.*

Interestingly, the link between depression or anxiety symptoms and sleep disturbance appears to be bi-directional in nature (Al-Abri, 2015). Yoo, Gujar, Hu, Jolesz, & Walker (2007, p. 878) describe a “hyper-limbic” state apparent in sleep deprived individuals who are exposed to stress in the form of “disgusting” or “disturbing” images. The report provides fMRI images which evidence reduced connectivity between the medial prefrontal cortex and the amygdala, suggesting a disinhibition of limbic responses. Disinhibited amygdala function is heavily associated with anxiety disorders and depressive symptoms (Davidson, 2002).

Schwarz, Gerhardsson, van Leeuwen, Lekander, Ericson, Fischer, & Åkerstedt (2018) showed that this heightened autonomic state can be facilitated by restricted sleep in a laboratory setting. The researchers studied 124 young (range = 18-30) and 94 older (range = 60-72) healthy adults after one night of laboratory controlled sleep deprivation. Autonomic stress was measured by elevated salivary cortisol levels combined with increased heart rate variability. Interestingly, the researchers had hypothesised that age would moderate the effects of sleep deprivation yet it appears that the older adults suffered the same levels of stress reactivity and impairment as the more youthful cohort. Schwarz et al.’s (2018) data is interesting because it suggests that the protective nature of tenure in relation to stress that was found in Jathanna et al.’s (2012) study isn’t a result of better sleep quality in veteran nurses.

### *Sleep and Impairment.*

Van Dongen, Maislin, Mullington, & Dinges (2003) provide preliminary evidence that restricted sleep, such as that undertaken by night shift workers (Åkerstedt & Wright, 2009), may be as detrimental as total sleep deprivation in certain circumstances. In a cohort of healthy adults (n=48, ages 21–38) Van Dongen et al. (2003) conducted a dose response chronic sleep restriction experiment. The researchers randomly sorted participants into four groups; Group 1 was

permitted 4 hours of sleep, group 2 was permitted 6 hours of sleep, group 3 was permitted 8 hours of sleep, and group 4 was designated a full deprivation group that was not permitted any sleep whatsoever for 72 hours. All groups were monitored within a laboratory setting.

Participants that experienced chronic sleep restriction amounting to 6 hours or less per night for a period of 14 consecutive days showed “cognitive performance deficits equivalent to 2 full nights of sleep deprivation” (Van Dongen et al., 2003, p. 124). Interestingly, subjective reports of sleepiness were not directly correlated to levels of impairment. Essentially, participants' subjective reports of sleepiness plateaued after the initial shock of restricted sleep, while levels of impairment seemed to steadily accumulate.

Worryingly, there appears a pronounced disruption of sleep in night shift and rotating shift (i.e. a mixture of day and night shifts) workers. Akerstedt & Wright (2009) found that individuals who worked on a rotating shift system reported up to 4 hours less sleep per day while working night shifts. When considered in light of Van Dongen et al.'s (2003) research, the accumulated effect of this level of sleep disruption after only two weeks is equivalent to 48 hours of total sleep deprivation. Given the well established relationship between nurse fatigue and medical error, this level of sleep restriction is problematic (Abdula et al., 2020). In fact, nurses working the night shift on a regular basis were 3.6 times more likely to fall asleep while driving to and from work compared to day or evening shift workers (Gold, Rogacz, Bock, Tosteson, Baum, Speizer, & Czeisler, 1992).

### *Sleep and Stress.*

Even during day or evening based work schedules, sleep disturbance displays a statistical correlation to levels of stress reported at work. Halonen, Lallukka, Pentti, Stenholm, Rod, Virtanen, & Vahtera (2017) analysed data taken from a representative sample of the Finnish population. The selected respondents (n=24873, mean age=43.5, SD=7.5) were working males (n=4,477) and working females (n=20,395). The researchers identified a possible directional relationship using a pseudo-longitudinal research method conducted between two time conditions, T1 (2000) and T2 (2012). Individuals that displayed job stress at T1 displayed insomnia related symptoms at T2. The inverse was also true in that individuals which displayed low levels of job strain at T1 were less likely to report insomnia at T2.

However, Van Laethem, Beckers, Kompier, Kecklund, van den Bossche, & Geurts (2015) found contradicting evidence using a true longitudinal design conducted across a more closely related and reliable range of one year (T1 = 2012, T2 = 2013). Among the studied cohort of Dutch employees surveyed online, there was no association found between work related stress at T1 and sleep problems at T2. There was, however, an association found between sleep problems at T1 and work related stress at T2. As of yet, it is unclear whether there is a causal relationship with sleep dysfunction preempting work stress or, a bi-directional relationship between impaired sleep and susceptibility to high levels of perceived stress.

### *Personality*

#### *Personality in nursing.*

Some of the variability in personality traits can be accounted for by genetic correlates (Vinkhuyzen, 2012; Smith, 2016). However, environmental factors also play a significant role (Van de larr, 2010). Myhren (2013) found a significant disparity of 39.39% difference between female (n=122) and male (n=23) healthcare worker's scores in neuroticism. Additionally, this research also found that staff with more than 7 years experience reported a 25% decrease in neuroticism scores. It is possible that only more stable males get into nursing and that the gender differences may be due to selection bias. Also, as stated in the above paragraph, survivor bias may skew the data concerned with stress in experienced nurses. Nonetheless, it serves to illuminate the complex relationship between environmental factors and the self report personality surveys.

Kennedy, Curtis, & Waters (2014) conducted an integrative literature review in order to investigate personality traits as predictors of nursing speciality choice. They noted that the overall quality of the literature concerning personality in the nursing profession was poor and often the studied cohorts were small. Additionally, the majority of the 13 studies included in the literature review were from mainland America, which may not provide a representative view of the international nursing population. Despite the limitations, Kennedy et al. (2014) did find evidence of variance across specialties but the variance that was found occurred largely within expected ranges.

#### *Personality and Gender.*

Sahi & Raghavi, (2016) conducted a relevant, yet somewhat limited, study investigating the associations between stress and personality traits; namely neuroticism, extroversion, and psychoticism. Their study was conducted using a convenience sample of 100 university students (f=50, m=50) and therefore may not be representative of a working population of adults.

Nevertheless, they did find significant positive correlations between the dimensions of neuroticism and psychoticism with general stress in the female cohort; and a correlation between stress and neuroticism in the male population. Furthermore, there was a positive correlation between stress symptoms and psychoticism in the general sample. Lastly, Sahi & Raghavi (2016) reported no significant gender differences in the domains of neuroticism, psychoticism, and extraversion. While these findings are interesting and relevant, the flawed research methodologies require the reported results to be approached with caution.

#### *Personality and Stress.*

Shimizutani, Odagiri, Ohya, Shimomitsu, Kristensen, Maruta, & Iimori (2008) surveyed female registered nurses (n=707) working in Japan. They found that nurses who reported high levels of neuroticism and low levels of extraversion were more likely to experience high levels of self report stress and ultimately, burnout. However, Burgess et al. (2010) found no evidence to support the literature on positive correlations between neuroticism and stress. Interestingly though, Burgess et al. (2010) did find that extraversion predicts healthcare workers abilities to deal with patients and their families without accruing any significant amount of stress.

#### *Personality and Sleep.*

Stephan, Sutin, Bayard, Križan, & Terracciano (2018) provide statistics taken from four separate longitudinal studies (n= >22,000, age range = 30-107) which display a cross cultural, lifelong positive correlation between high extraversion/low neuroticism personality type and desirable sleep quality. This is confirmed by a number of studies. Maia, Soares, Gomes, Marques, Pereira, Valente, & Macedo (2009) found that neuroticism was associated with concentration difficulties in the morning, inadequate sleep duration, sleep problems, and use of sleep medication. Although, extroversion displayed no relationship to sleep behaviors (Maia et al, 2009). Calkins, Hearon, Capozzoli, & Otto (2013) found a positive association between sleep disturbances and neuroticism. The data reported claimed that neuroticism accounted for 12.5% of

the variance in sleep disturbance. Additionally, Kim, Cho, Chang, Ryu, Shin, & Kim (2015) investigated the relationship between personality and self report sleep in a cohort of Korean women (n=1,406, age range = 18-40). They found a significant correlation between neuroticism ( $p = <.001$ ) and low sleep quality ( $p=.001$ ) measured using the pittsburgh sleep index.

Pace-Schott, Rubin, Tracy, Spencer, Orr, & Verga (2015) conducted a study on healthy male college students (n=109, mean age = 20.9, SD = 2.6) utilizing skin conductance response (SCR) and self report measurements of personality trait neuroticism and selected sleep dimensions. The aim was to investigate extinction learning efficacy as a correlate of personality and sleep, with the aim being to investigate low neuroticism and normal sleep patterns as they relate to the efficiency of extinction learning (Pace-Schott et al., 2015).

The research team obtained partial confirmation that neuroticism was associated with later sleep timing and lower sleep quality. They also attained confirmation that late sleep timing and lower sleep quality were associated with worse extinction learning and recall. Interestingly, they did not find a direct relationship between trait neuroticism and extinction learning or recall efficacy. This illustrates the mediating role of sleep between trait neuroticism and environmental stressors (Pace-Schott et al., 2015). This may indicate that the restricted sleep schedules common in the nursing profession may actually inhibit acclimatization to environmental stressors in individuals who display high trait neuroticism.

Finally, Huang, Peck, Mallya, Lupien, & Fiocco (2016) conducted an investigation into the mediating effects of sleep between depression and personality among a cohort of 114 middle-aged adults (mean age = 57.92, SD = 4.00, age range = 47–67). They identified that subjective sleep quality had an “indirect mediating effect on the relationship between personality traits and depressive symptoms” (Huang et al, 2015, p. 14). Huang et al.’s (2016) data may have implications for nurse retention. If restricted sleep acts as a catalyst for those individuals predisposed to mental health issues then sleep schedules may be prioritized in order to reduce nurse turnover.

#### *Aims Rationale*

The World Health Organisation (2016) predicts a shortage of 9 million nursing staff worldwide within the next decade. In order to mitigate the effects of this global nursing staff shortage, research must target nurse retention with the aim of informing retention and

recruitment focused interventions. Stress has been identified as a key marker of turnover intention in the nursing profession (Gray-Toft & Anderson, 1982). Further, deficient sleep has been shown to predispose individuals to stress hyper-reactivity. Therefore, this study investigates the relationship between stress and sleep while controlling for personal, personological, and organizational factors in a cohort of Irish nurses.

### *Hypotheses*

- 1) Respondents reported average nightly sleep will be related to their scores on the Nursing Stress Scale
- 2) Respondents self reports of sleep adequacy on the MOS Sleep Survey will be related to their scores on the Nursing Stress Scale
- 3) Respondents Somnolence scores on the MOS Sleep Survey will be related to their scores on the Nursing Stress Scale
- 4) Respondents Neuroticism Scores on the EPQR-A personality measure will be related to their scores on the Nursing Stress Scale
- 5) Respondents Extroversion scores on the EPQR-A personality measure will be related to their scores on the Nursing Stress Scale
- 6) The relationship between scores on the MOS Sleep survey and Nursing Stress scale will be mediated by scores on the EPQR-A Neuroticism scale.
- 7) The relationship between scores on the MOS Sleep survey and Nursing Stress scale will be mediated by scores on the EPQR-A Extroversion scale.
- 8) Those respondents who report working the “night shift” either all or part of the time will report insufficient sleep and higher instances of stress.
- 9) Tenure will relate with personality type, frequency of experienced stress, and the quality and

quantity of respondents sleep.

## Methods

### *Participants*

A survey was circulated by a number of nursing rights advocates and associations via social media. The link was accompanied by a small statement which was tailored by the individual posters which stated paraphrased the statement:

“Dublin Business School is conducting a survey on stress and sleep in the nursing profession. Please respond and share.”

The survey began with a yes or no question asking the respondent whether or not they were a currently practicing nurse in the republic of Ireland. Exactly 400 responses were recorded in total, of which self-described as currently employed nurses and, as such, were deemed valid. Participants responded without coercion, however, this data has been collected amidst widespread calls for reform to the health service in Ireland. The large number of responses are likely due to a felt need for research concerning working conditions in the nursing profession.

The population (age range=22-61, mean=41.47, SD=8.651) comprises a somewhat representative division of males (n=19) to females (n=312). However, this gender divide may be indicative or biased sampling due to the compounding snowball effect of female to female relationships inherent in social media nursing advocacy networks. The majority of the respondents were married, partnered, or single (Table 1); 72.09% of respondents have children (range = 0-6, mean = 2.38, SD = 1.07); and 14.2% of respondents were acting carers for infirm relatives.

Table 1. *Marriage statistics of Surveyed Population*

<b>Variable</b>	<b>Frequency</b>	<b>Valid Percent</b>
<b>Married</b>	216	59.8
<b>Partnered</b>	65	18
<b>Divorced</b>	18	5
<b>Widowed</b>	3	0.8
<b>Single</b>	59	16.3
<b>Total</b>	361	100

The mean length of reported employment as a professional nurse in the surveyed population is 18.53 years (range=1-43, SD=10.05). While the mean duration of the respondents employment in their current role is 9.04 years (range=0.25-35years, SD=7.34). Lastly, the mean working week in the surveyed population is approximately 35.75 hours long (range=3-85, SD=8.73).

### *Design*

This study utilized a quantitative method to study personality type, frequency of stress, and self report sleep in a cohort of Irish Nurses. An ex post facto, or causal-comparative design, was employed within groups to investigate the stress-sleep relationship, with personality and demographic factors as possible confounding factors. The statistical analysis for H1, H2, H3, H4, & H5 utilized Kruskal-Wallis H Tests to conduct non-parametric means comparisons. H6 & H7 utilized an ANCOVA to investigate the mediating effect of personality on the relationship between sleep and stress. H7 employed a Mann Whitney U test to investigate the mean scores of those who perform part or all of their duties at night versus those who only work day shifts.

Finally, H9 employed a spearman's Rho correlation and a Kruskal Wallis H Test to investigate the relationship tenure to stress, sleep and personality.

Figure 2. *Variable Structure of the Proposed Hypothesis*

<b>Hypotheses</b>	<b>Independent</b>	<b>Dependant</b>	<b>Categorical</b>	
	<b>Variable</b>	<b>Variable</b>	<b>Predictor Variable</b>	<b>Covariate</b>
	Average Nightly			
H1.	Sleep	Stress	-	-
H2.	Adequacy	Stress	-	-
H3.	Somnolence	Stress	-	-
H4.	Neuroticism	Stress	-	-
H5.	Extroversion	Stress	-	-
H6.			Average Nightly	
H6.1	-	Stress	Sleep	Neuroticism
H6.2	-	Stress	Adequacy	Neuroticism
H6.3	-	Stress	Somnolence	Neuroticism
H7.			Average Nightly	
H7.1	-	Stress	Sleep	Extroversion
H7.2	-	Stress	Adequacy	Extroversion
H7.3	-	Stress	Somnolence	Extroversion

H8.

H8.1	Shift Work	Stress	-	-
H8.2	Shift Work	Personality	-	-
H8.3	Shift Work	Sleep	-	-

H9.

H9.1	Shift Work	Stress	-	-
H9.2	Shift Work	Personality	-	-
H9.3	Shift Work	Sleep	-	-

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#### *Apparatus*

Data was collected using microsoft forms free survey software and analysed using IBM's statistical package, SPSS.

#### *The Nursing Stress Scale - Appendix C*

The nursing stress scale (Gray-Toft & Anderson, 1984) is a 34 item questionnaire that measures the perceived frequency of stress experienced in the Nursing Profession. A small excerpt from the Nursing Stress Scale (NSS) has been provided as an example of the introductory prompt, item format, and response format used (See Figure 1).

Below is a list of situations that commonly occur on a hospital unit. For each item indicate how often on your present unit you have found these situations to be stressful.

	Never	Occasionally	Frequently	Very frequently
Breakdown of computer	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Criticism by a physician	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1. *Excerpt from the distributed survey - Nursing Stress Scale*

Responses for each item ranged from 0-3 with “never” being scored as a 0, “occasionally” being scored as a 1, etc... Therefore, the possible range for total stress scores was 0-102 with 102 representing the highest frequency of experienced stress. The NSS has seven subscales, each of which measure exposure to a specific source of stress within the nursing profession. The subscales and their recorded reliability within this dataset are provided below:

Table 3. *Cronbach’s Alpha Values for the Nursing Stress Scale*

Variable	Number of Items	Alpha
Total NSS	34	0.92
Death and Dying	7	0.78
Conflict with Physicians	5	0.64
Inadequate Prep	3	0.77
Lack of Support	3	0.70

Conflict with Other Nurses	5	0.66
Workload	6	0.81
Uncertainty Concerning Treatment	5	0.73

---

Gray-Toft & Anderson (1981) provided initial proof of validity for the NSS by correlating respondents scores with chosen measures of trait anxiety ( $r=.39^*$ ) state anxiety ( $r=.35^*$ ) , and job satisfaction ( $r=-.15^*$ ) (Krug et al., 1976; Sippelle et al., 1976; Smith et al., 1969).

Gray-Toft & Anderson (1981) also provided initial data suggesting that high scores on the NSS were significant predictors of nurse turnover (See Table 4).

Table 4. *NSS Validity - Correlations with Turnover Rates*

<b>Area of Operation</b>	<b>Mean Score NSS Total</b>	<b>% Turnover</b>
Hospice	84.59	0
Surgery	85.07	6
Oncology	88.71	11
Cardiovascular Surgery	91.21	15
Medicine	94.11	30

---

*Medical Outcomes Sleep Survey - Appendix D*

\_\_\_\_\_The Medical Outcomes Survey-Sleep (MOS-Sleep) a 12 item measure used to survey important aspects of sleep as reported by an adult population (Hays & Steward, 1992). For the purposes of this study, three subscales from the MOS-Sleep were used. Sleep quantity (SLPQRAW) is a single item measure; it records the average amount of self reported sleep per night over a 4 week period. Sleep Adequacy (SLPA2) is a two item measure that records the felt sufficiency of sleep over a 4 week period period ( $\alpha=.74$ ,  $n=3$ ). Somnolence (SLPS3) is a three item measure used to record levels of felt sleepiness during respondents' waking hours ( $\alpha=.87$ ,  $n=2$ ). A small excerpt from the MOS-Sleep has been provided as an example of the introductory prompt, item format, and response format used (See Figure 2).

How often during the past 4 weeks did you...	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
feel drowsy or sleepy during the day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have trouble staying awake during the day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
take naps (5 minutes or longer) during the day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
get enough sleep to feel rested upon waking in the morning?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
get the amount of sleep you needed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2. Excerpt from the Distributed Survey - MOS-Sleep

Responses were recorded using a 6 point likert scale with responses ranging from 1 - “All of the time” to 6 - “None of the time”. Scoring was reversed for all items in SLPA2 and SLPS3.

The researchers recommend that the variables be recorded so that scores represent points on a scale of 0-100%. SLPA2 therefore has a range of 0-100 with 0 meaning low adequacy and 100 meaning high adequacy. In SLPS3 however, the scores are further reversed a second time so that a score of 0 represents low somnolence and a score of 100 represents high somnolence (Spritzer & Hays, 2003).

Smith and Wegner (2003) state that the MOS-Sleep has good face validity but limited psychometric validation. Since then a number of disorder specific validities have been provided but no general comparison with other sleep scales has been conducted (Allen, Kosinski, Hill-Zabala, & Calloway, 2009; Hays & Steward, 2003\*). The researchers provide figures of construct validity whereby items on the MOS-Sleep were compared with general items which are part of the broader MOS (See Table 5), and considered to have a predictable relationship to sleep (Smith & Wegener, 2003)

Table 5. *MOS-Sleep Construct Validity - Correlations with Related MOS Measures*

<b>Related MOS Measure</b>	<b>Correlations</b>
Effects of pain	.53
Pain severity	.44
Physical Symptoms	.57
Energy/fatigue	.60
Physical Functioning	.36
Cognitive functioning	.53
Depression/behavioral-emotional control	.57
Anxiety	.57

Positive affect

.55

*Eysenck Personality Questionnaire Revised Abbreviated (EPQR-A) - Appendix E*

The Eysenck Personality Questionnaire Revised - Abbreviated (EPQR-A) is a 24 item functional equivalent of the well established Eysenck Personality Questionnaire. The EPQR-A consists of four subscales; Neuroticism ( $\alpha=.63$ ,  $n=6$ ), Extroversion ( $\alpha=.80$ ,  $n=6$ ), Psychoticism ( $\alpha=.05$ ,  $n=6$ ), and the Lie Scale ( $\alpha=.55$ ,  $n=6$ ). A small excerpt from the EPQR-A has been provided as an example of the introductory prompt, item format, and response format used (See Figure 3)

Please answer the questions below as accurately as possible

	Yes	No
Does your mood often go up and down?	<input type="radio"/>	<input type="radio"/>
Are you a talkative person?	<input type="radio"/>	<input type="radio"/>

Figure 3. *Excerpt from the Distributed Survey - EPQR-A*

Responses were recorded in a “yes” or “no” binary format. Each subscale contained a range of 0-6 whereby 6 indicated an abundance of the given trait and 0 indicated an absence of the measured trait.

Concurrent validity was measured using correlations between the EPQR-A and its parent scale the EPQ (See Table 6).

Table 6. *EPQR-A Correllary Reliability*

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EPQR-A Subscales	Correlations
Neuroticism	.93
Extroversion	.92
Psychoticism	.90
Lie Scale	.80

---

### *Ethics*

All participants were over 18 and gave full knowing consent to participate. One consideration is that this survey asks respondents to recall stressful experiences, some of which concern death and dying. In order to facilitate any emotional discomfort which was aggravated by participation, a debriefing sheet was provided upon completion which offered support service contact information (Appendix B). All respondents had the right to withdraw at any time.

## *Results*

### *Descriptive Statistics*

This section provides statistical information concerning the recorded data arising from the distribution of the EPQR-A, the NSS, and the MOS-Sleep. Means, Standard Deviations, Reliability Statistics, and Number of items contained in a measure will be provided. The frequency tables provided detail the cut points of any grouped data as well as the valid percent and the sum of all grouped respondents. Note, none of the data provided met the shapiro-wilks assumptions for parametric testing.

#### *Medical Outcomes Survey - Sleep*

Table 7 shows the descriptive statistics for the selected subscales of the MOS- Sleep survey. The adequacy data set displayed a Particularly high standard deviation but this may be due to the nature of the data. Adequacy scale showed a moderate negative skewness of  $-.84$  ( $SE = 0.13$ ) while the corresponding somnolence scale unexpectedly showed a contradicting moderate positive skewness of  $.66$  ( $SE = .13$ ). Further, none of the datasets from the MOS-Sleep met the shapiro-wilk parameters and as such were assumed to be unfit for parametric testing. As a result, all datasets from the MOS-Sleep were grouped according to their logical divisions to facilitate a non-parametric means comparison. Tables 8, 9, and 10 details the cut points for the MOS sleep scale variable groupings. Raw sleep data was divided into 5 subgroups, each

representing an hours range with the extremes, 4> & 7<, being rounded off (See Table 8). Sleep Adequacy and Somnolence were divided into quartiles as evenly as the data would permit (See tables 9 & 10 respectively).

Table 7. *Descriptive Statistics for the MOS-Sleep Survey Subscales*

<b>Variable</b>	<b>Range</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>No. of Items</b>	<b>Alpha</b>
Hours Per-Night	Scale	5.98	0.98	1	*
Adequacy	0 - 100	25.63	21.90	2	0.74
Somnolence	0 - 100	36.99	20.59	3	0.75

\* = Single item measure

Table 8. *Frequency Statistics for the reported nightly average sleep groups*

<b>Variable</b>	<b>Groups</b>	<b>Number</b>	<b>Valid Percent</b>
<b>Average sleep per-night</b>	4 hours or less	21	5.8
	4 to 5 hours	71	19.5
	5 to 6 hours	155	42.6
	6 to 7 hours	95	26.1
	7 hours or more	22	6



The respondent who displayed the lowest levels of stress scored 3 points in total and the respondent who displayed the highest frequency of stress reported a score of 83 (See table 11). The skewness inherent in the data sets for Death and Dying (.519, SE = .13) and Workload (-.508, SE = .13) was deemed moderate. Conflict with physicians and conflict with nurses showed Slightly reduced Alphas as compared to the rest of the subscales. Neither the NSS total, nor any the NSS subscales, met the required Shapiro-Wilks assumptions for parametric analysis. There are no accepted population norms given for the NSS, however, it is notable that Workload had the highest relative score with a mean equal to 64.16% of the possible range. Lack of support (41.66%), Conflict with Physicians (39.33%), and Conflict with Other Nurses (37.06%) were the next highest relative means.

Table 11. *Descriptive statistics for the Nursing Stress Scale and associated subscales*

<b>Variable</b>	<b>Range</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>No. of Items</b>	<b>Alpha</b>
Nursing Stress Scale	0-102	42.95	14.21	34	0.92
Death and Dying	0-21	7.76	3.72	7	0.78
Conflict with Physicians	0-15	5.90	2.37	5	0.64
Inadequate Preparation	0-9	3.31	1.81	3	0.77
Lack of Support	0-9	3.75	2.04	3	0.7
Conflict with Other Nurses	0-15	5.56	2.78	5	0.66
Workload	0-18	11.55	3.71	6	0.81

Uncertainty					
Concerning	0-15	5.4	2.78	5	0.73
Treatment					

---

### *EPQR-A*

Table 12 shows descriptive statistics for the four subscales of the EPQR-A. Psychoticism displayed a very limited range of responses, of a possible range of 0-6 only 1-4 were represented in the data. Further, this left modal clustering of responses rendered the scale as decidedly unreliable. Further, psychoticism's skewness registered as 1.26 (SE = .13) and kurtosis registered a reading of 1.87 (SE = .26). Therefore this scale was deemed unfit for purpose and is not included in further analyses. Likewise, the Lie scale suffered from reliability issues and failed to show any significant effects in initial exploratory analysis. Therefore the Lie Scale was excluded from further manipulations and is not included in any of the proceeding analyses.

Table 12. *Descriptive Statistics for EPQR-A*

<b>Variable</b>	<b>Range</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>No. of Items</b>	<b>Alpha</b>
<b>Neuroticism</b>	0.0 - 6.0	3.44	1.50	6	0.63
<b>Extraversion</b>	0.0 - 6.0	3.78	1.98	6	0.80
<b>Psychoticism</b>	0.0 - 6.0	2.25	0.56	6	0.03
<b>Lie</b>	0.0 - 6.0	4.07	1.47	6	0.55

Extraversion suffered from pronounced kurtosis -1.16 (SE = .26) and a standard deviation greater than 50% of the given mean. The distribution problems in the neuroticism scale were less severe, however, the reliability statistics were under the .7 level of acceptability given by Cronbach. Further, none of the personality subscales met the Shapiro-Wilks criteria for

parametric testing. Given the numerous significant effects found in initial exploratory analysis it was decided that the Extraversion and Neuroticism datasets would be grouped into quartiles in order to facilitate statistical analysis via nonparametric means comparisons. Tables 13 & 14 show the quartile groupings of the extraversion and neuroticism personality subscales.

Table 13. *Frequency Statistics for Neuroticism Subscale of EPQR-A*

<b>Variable</b>	<b>Groups</b>	<b>Number</b>	<b>Valid Percent</b>
<b>Neuroticism</b>	0.0 - 2.0	94	26.7
	2.1 - 3.0	70	19.9
	3.1 - 4.0	105	29.8
	4.1 - 6.0	83	23.6
	<b>Total</b>	<b>352</b>	<b>100</b>

Table 14. *Frequency Statistics for Extraversion Subscale of EPQR-A*

<b>Variable</b>	<b>Groups</b>	<b>Number</b>	<b>Valid Percent</b>
<b>Extraversion</b>	0 - 1	57	16.3
	1.1 - 3	90	25.8
	3.1 - 5	99	28.4
	5.1 - 6	103	29.5
	<b>Total</b>	<b>349</b>	<b>100</b>

*Inferential Statistics*

**H1) Respondents reported average nightly sleep will be related to their scores on the Nursing Stress Scale**

A Kruskal-Wallis H test (See Table 15) showed that reported average nightly sleep and the NSS total means did differ significantly ( $\chi^2(4) = 16.72, p = .001$ ). Further, reported average nightly sleep also displayed significant mean differences in relation to all of the NSS sub-scales.

Table 15. *Kruskal-Wallis H Test Concerning the Reported Nightly Sleep Average and the NSS*

*Total Frequency of Stress Experienced*

<b>Variable</b>	<b>Kruskal-Wallis H</b>	<b>df</b>	<b>Sig.</b>
Nursing Stress Scale Total	19.24	4	0.001
Death and Dying	12.07	4	0.017
Conflict with Physicians	17.52	4	0.002
Inadequate Preparation	15.064	4	0.005
Lack of Support	8.77	4	0.067
Conflict with Other Nurses	5.66	4	0.226
Workload	15.03	4	0.005
Uncertainty Concerning Treatment	15.43	4	0.004

The most pronounced effects were found when comparing the reported average nightly sleep (See Figure X) to the means of reported stress experienced due to conflict with physicians ( $\chi^2(4) = 17.52, p = .002$ ) and the means of experienced stress related to uncertainty concerning treatments ( $\chi^2(4) = 15.43, p = .004$ ).

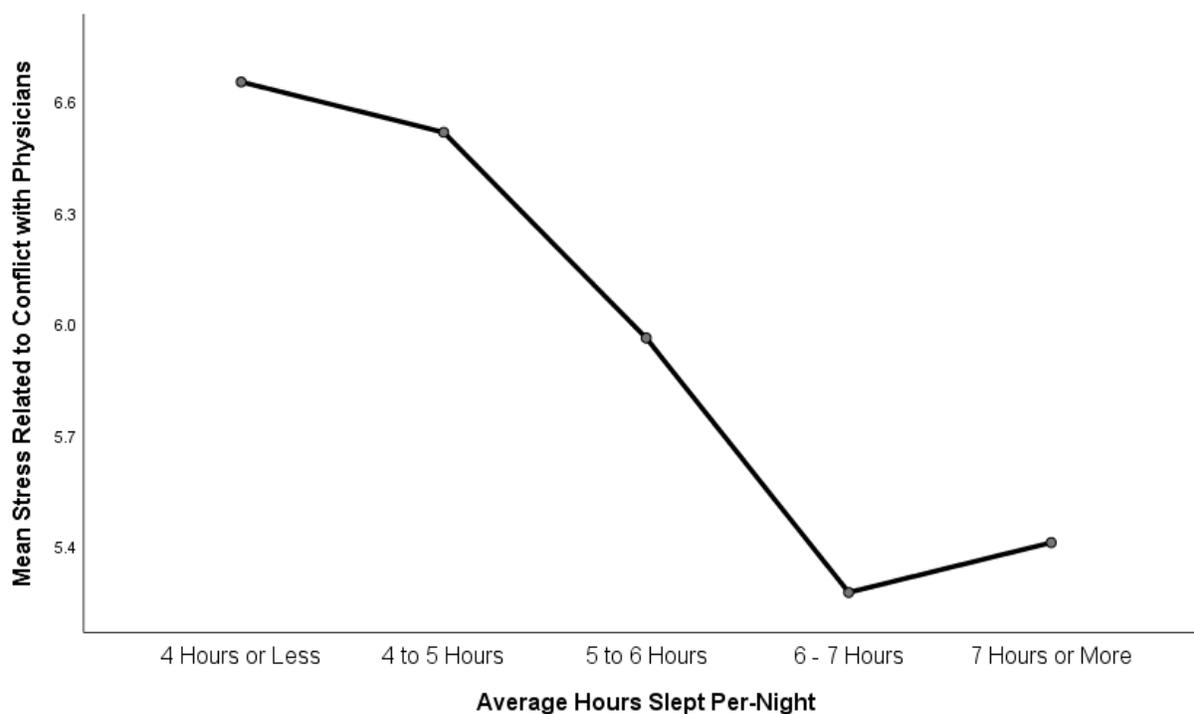


Figure 4. *Reported nightly average sleep and stress due to conflict with physicians means comparison*

### *Conclusion*

Figure 3 clearly shows the effect of diminished self-report sleep volume as it relates to frequency of stress arising from conflict with physicians. Given the clear relationship displayed by the above analyses the null is hereby rejected.

**H2) Respondents self reports of sleep adequacy on the MOS Sleep Survey will be related to their scores on the Nursing Stress Scale**

A Kruskal-Wallis H test showed that self reported sleep adequacy and the NSS total means did differ significantly ( $\chi^2(3) = 16.72, p = .001$ ). Further, the MOS-Sleep Adequacy scale also displayed significant differences to 6 of the 7 NSS sub-scales (See Table 16). The only subscale which proved to have an insignificant relationship to self reports of sleep adequacy was death and dying ( $\chi^2(3) = 7.42, p = .06$ ). The most pronounced effects were found when comparing the MOS-Sleep Adequacy scores (See Figure 5) to the mean stress experienced from Workload related stress ( $\chi^2(3) = 17.93, p = .000$ ) and the mean stress related to uncertainty concerning treatments ( $\chi^2(3) = 16.06, p = .001$ ).

Table 16. *Kruskal-Wallis H Test Concerning MOS-Sleep Adequacy and the NSS*

<b>Variable</b>	<b>Kruskal-Wallis H</b>	<b>df</b>	<b>Sig.</b>
Nursing Stress Scale Total	16.72	3	0.001
Death and Dying	7.42	3	0.06
Conflict with Physicians	11.95	3	0.008
Inadequate Preparation	10.31	3	0.016
Lack of Support	9.39	3	0.024
Conflict with Other Nurses	9.25	3	0.026
Workload	17.93	3	0.00
Uncertainty Concerning Treatment	16.06	3	0.001

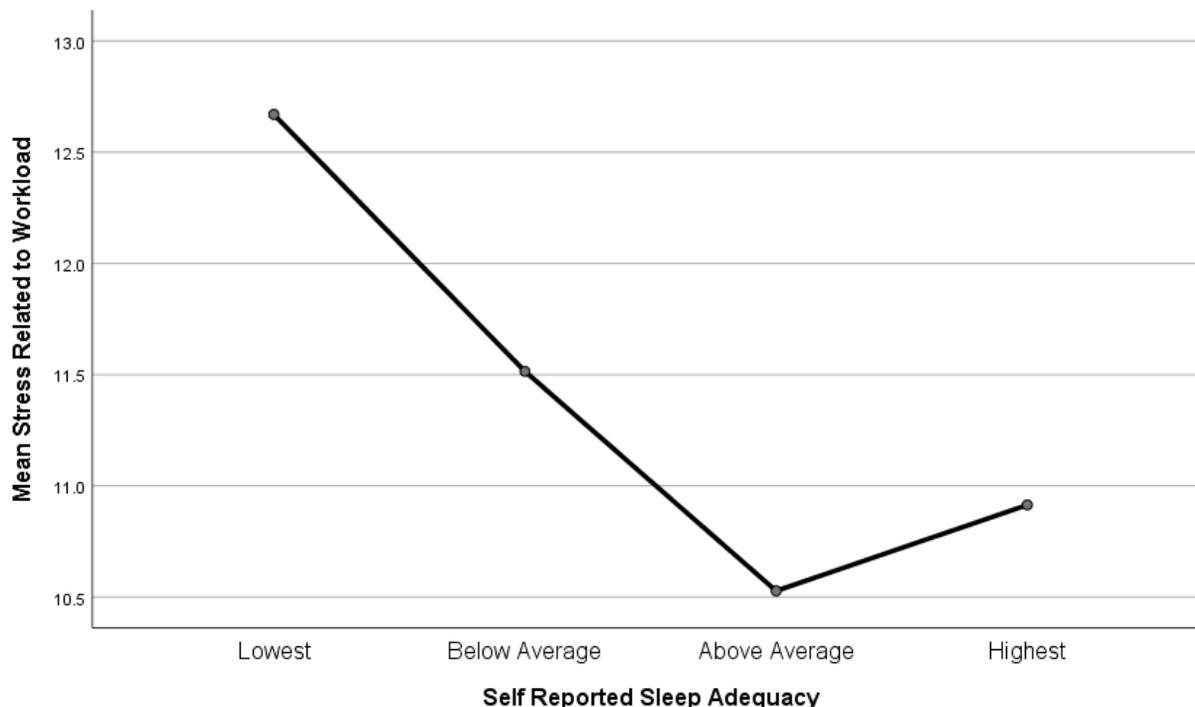


Figure 5. Means plot detailing effect of adequate sleep as it relates to frequency of stress concerning workload.

### Conclusion

There is a clear relationship detailed between the perceived adequacy of respondent sleep according to self reports and the frequency of salient stressful experiences, particularly stress that is related to workload. Given the above analyses the null is hereby rejected.

### **H3) Respondents Somnolence scores on the MOS Sleep Survey will be related to their scores on the Nursing Stress Scale**

A Kruskal-Wallis H test showed that self reported levels of somnolence and the NSS total means did differ significantly ( $\chi^2(3) = 22.37, p = .000$ ). Further, self reported levels of somnolence also displayed significant differences to all of the NSS sub-scales (See Table 17). The most pronounced effects were found when comparing self reported levels of somnolence (See Figure 6) to the mean stress experienced from workload related stress ( $\chi^2(3) = 16.62, p = .001$ ) and the mean stress related to conflict with physicians ( $\chi^2(3) = 16.00, p = .001$ ).

Table 17. *Kruskal-Wallis H Test Concerning MOS-Sleep Somnolence and the NSS*

<b>Variable</b>	<b>Kruskal-Wallis H</b>	<b>df</b>	<b>Sig.</b>
Nursing Stress Scale Total	22.37	3	0.000
Death and Dying	8.01	3	0.046
Conflict with Physicians	16.00	3	0.001
Inadequate Preparation	15.62	3	0.001
Lack of Support	14.80	3	0.002
Conflict with Other Nurses	13.92	3	0.003
Workload	16.62	3	0.001
Uncertainty Concerning Treatment	10.84	3	0.013

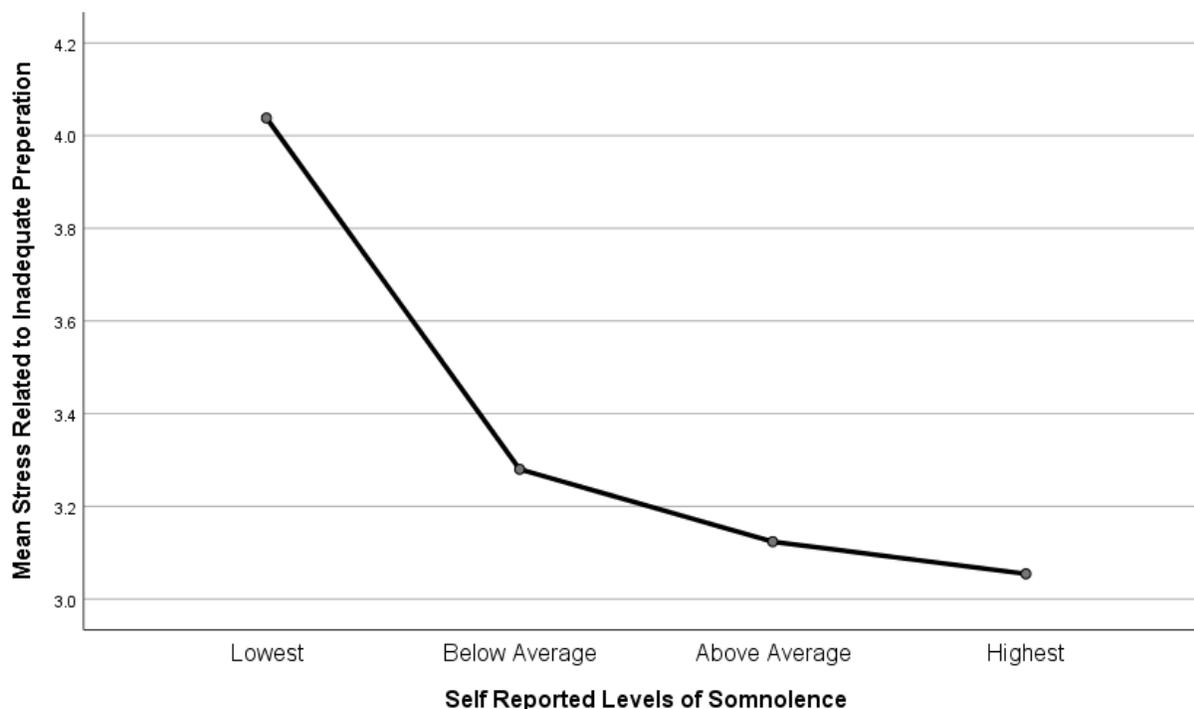


Figure 6. *Self-reported somnolence and stress due to inadequate preparation means comparison*

### *Conclusion*

Figure 6 clearly shows that levels of somnolence display a relationship to stress resulting from feeling inadequately prepared to operate in a nursing role. Given the abundance of positive results the null is hereby rejected.

### **H4) Respondents Neuroticism Scores on the EPQR-A personality measure will be related to their scores on the Nursing Stress Scale**

A Kruskal-Wallis H test showed that EPQR-A Neuroticism and the NSS total means did differ significantly ( $\chi^2(3) = 42.61, p = .000$ ). Further, EPQR-A Neuroticism also displayed significant differences to 6 of the 7 NSS sub-scales (See Table 18). The only subscale which proved to have an insignificant relationship to EPQR-A Neuroticism was Lack of Support ( $\chi^2(3) = 4.10, p = .251$ ). The most pronounced effects were found when comparing EPQR-A Neuroticism to the mean stress experienced conflict with physicians ( $\chi^2(3) = 28.53, p = .000$ ) and the mean stress related to inadequate preparation ( $\chi^2(3) = 21.55, p = .000$ ).

Table 18. *Kruskal-Wallis H Test Concerning EPQR-A Neuroticism and the NSS*

<b>Variable</b>	<b>Kruskal- Wallis H</b>	<b>df</b>	<b>Sig.</b>
<b>Nursing</b>			
<b>Stress</b>	24.607	3	0.000
<b>Scale Total</b>			
<b>Death and Dying</b>	14.481	3	0.002
<b>Conflict with Physicians</b>	28.53	3	0.000
<b>Inadequate Preparation</b>	21.555	3	0.000
<b>Lack of Support</b>	4.103	3	0.251
<b>Conflict with Other Nurses</b>	10.019	3	0.018
<b>Workload</b>	8.339	3	0.039
<b>Uncertainty Concerning Treatment</b>	17.96	3	0.000

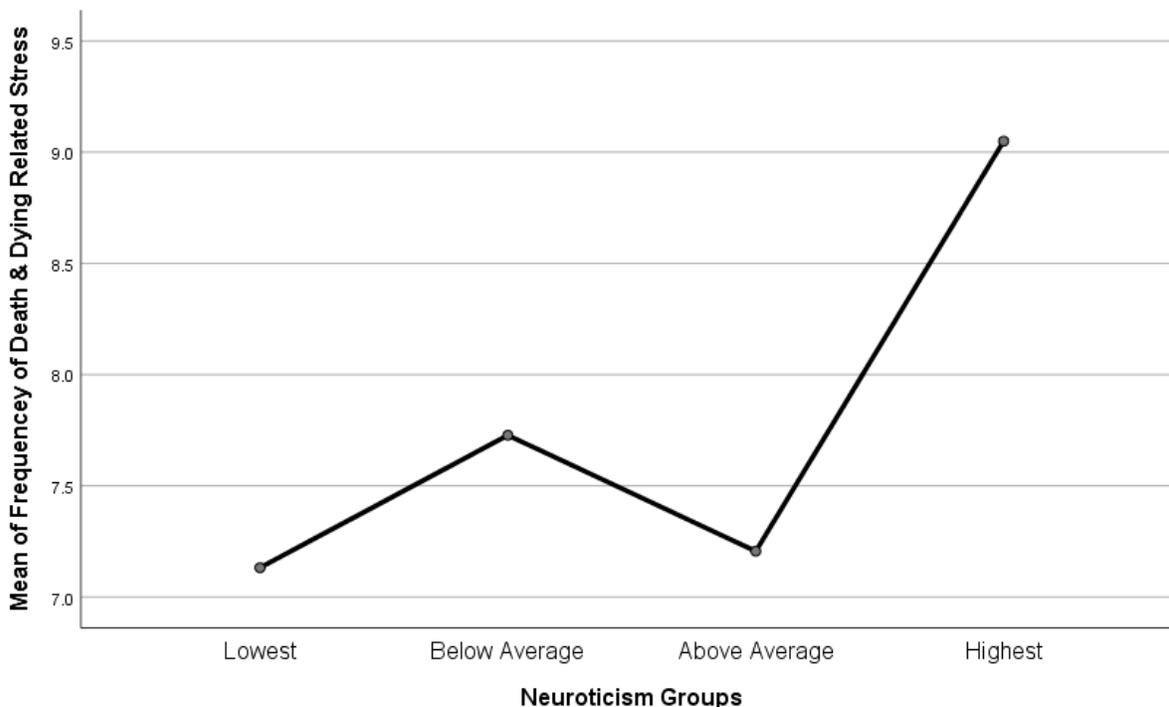


Figure 7. *EPQR-A Neuroticism Means Plotted Against Death and Dying Related Stress*

### *Conclusion*

Figure 7. displayed a nonlinear relationship between neuroticism and Death and dying related stress which evidences a significant increase in stress reported by those in the most neurotic group compared to the least neurotic. The analyses provided above supports a rejection of the null.

### **H5) Respondents Extroversion scores on the EPQR-A personality measure will be related to their scores on the Nursing Stress Scale**

A Kruskal-Wallis H test showed that EPQR-A Extroversion and the NSS total means did not differ significantly ( $\chi^2(3) = .252, p = .969$ ). Further, EPQR-A Extroversion did not display significant differences to any of the NSS sub-scales (See Table 19). Therefore, the null must be accepted.

Table 19. *Kruskal-Wallis H Test Concerning EPQR-A Extroversion and the NSS*

<b>Variable</b>	<b>Kruskal-Wallis H</b>	<b>df</b>	<b>Sig.</b>
<b>Nursing Stress Scale Total</b>	0.252	3	0.969
<b>Death and Dying</b>	2.076	3	0.557
<b>Conflict with Physicians</b>	1.335	3	0.721
<b>Inadequate Preparation</b>	3.486	3	0.323
<b>Lack of Support</b>	0.477	3	0.924
<b>Conflict with Other Nurses</b>	1.49	3	0.685
<b>Workload</b>	2.426	3	0.489
<b>Uncertainty Concerning Treatment</b>	6.368	3	0.095

**H6) The relationship between scores on the MOS Sleep survey and Nursing Stress scale will be mediated by scores on the EPQR-A Neuroticism scale.**

Ancovas were performed to investigate the mediating effect of trait neuroticism on the relationship between NSS Total and 1) Somnolence, 2) Adequacy, & 3) Nightly Average Sleep.

*H6.1) Neuroticism as covariate of reported nightly average sleep*

A one-way ANCOVA was conducted to examine the amount of stress experienced as it relates to the average hours sleep reported per night where neuroticism was controlled for, which had a significant result ( $F(1,318) = 3.32, p = .011$ ). The covariate EPQR-A Neuroticism subscale had a significant strong relationship with the dependent variable Total Stress Experienced with an effect size of .066 ( $F(1, 318) = 22.50, p < .000$ ) (See Figure 8)

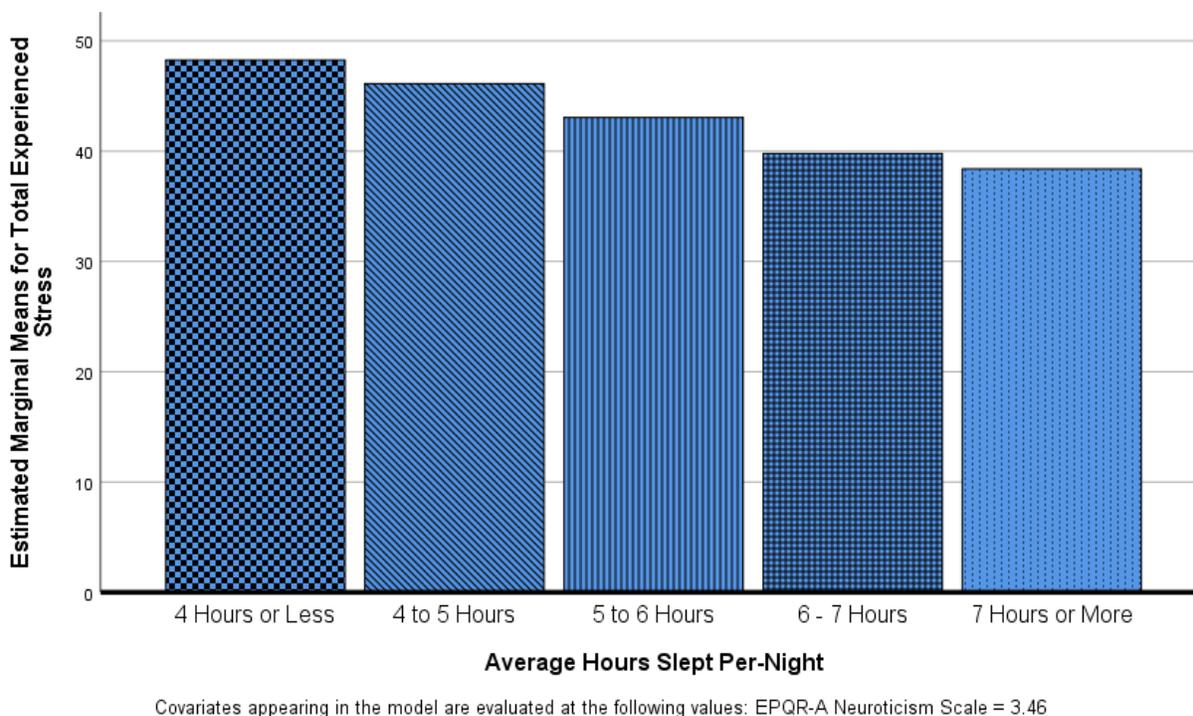


Figure 8. *The effects of nightly average sleep when compared to marginal means of total stress*

#### *H6.2) Neuroticism as covariate of reported sleep adequacy*

A one-way ANCOVA was conducted to examine the amount of stress experienced as it relates to the self-reported adequacy of sleep where neuroticism was controlled for, which had a significant result ( $F(3,318) = 3.60, p = .014$ ). The covariate EPQR-A Neuroticism subscale had a significant strong relationship with the dependent variable Total Stress Experienced with an effect size of .060 ( $F(1, 318) = 18.88, p < .000$ ) (See Figure 9)

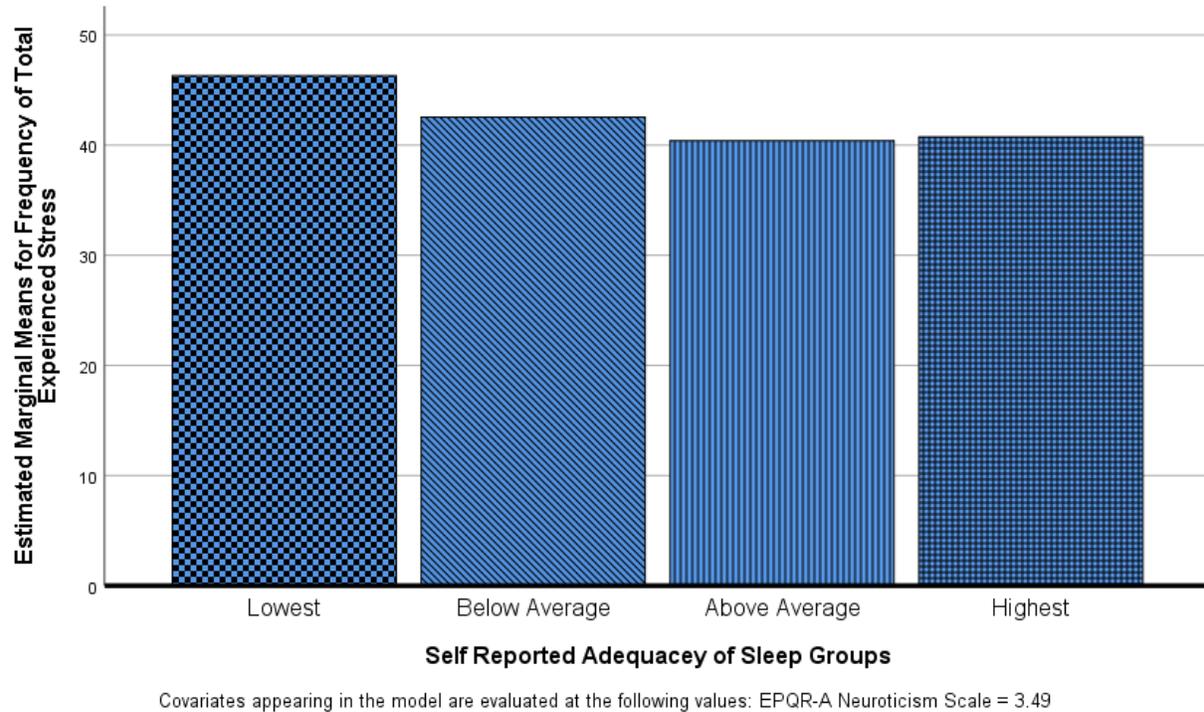
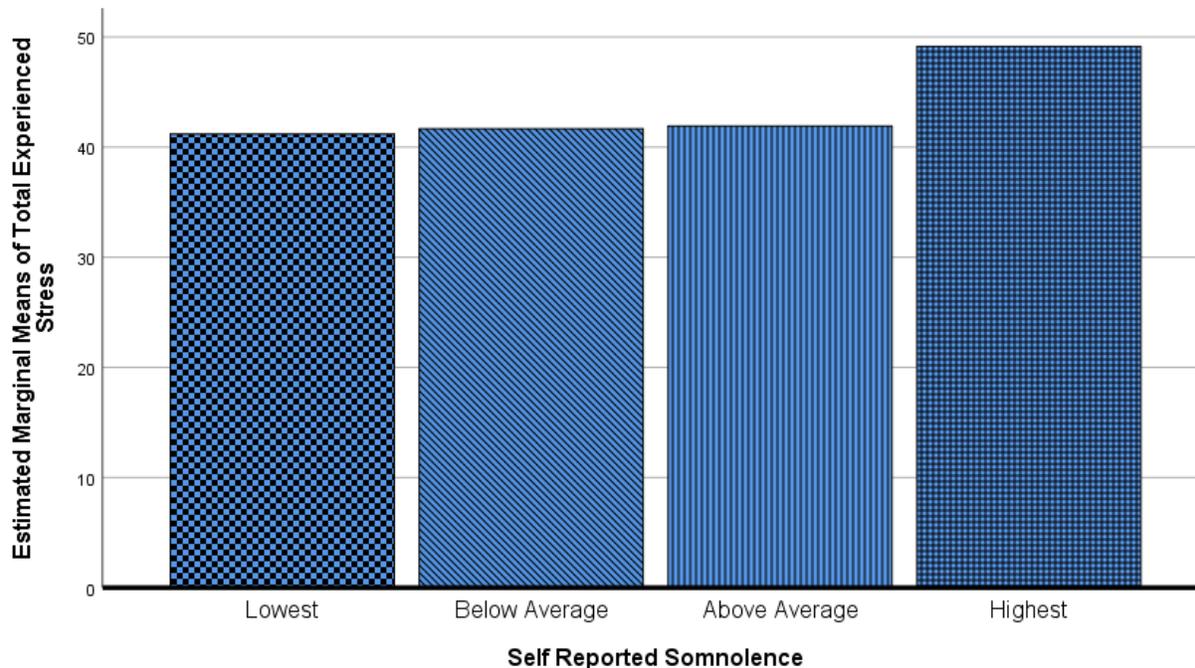


Figure 9. *The effects of Self-Report Sleep Adequacy when compared to Marginal Means of Total Stress*

### *H6.3) Neuroticism as covariate of reported somnolence*

A one-way ANCOVA was conducted to examine the amount of stress experienced as it relates to the self-reported experiences of somnolence where neuroticism was controlled for, which had a significant result ( $F(3,303) = 5.78, p = .001$ ). The covariate EPQR-A Neuroticism subscale had a significant strong relationship with the dependent variable Total Stress Experienced with an effect size of .05 ( $F(1, 303) = 16.01, p < .000$ ).



Covariates appearing in the model are evaluated at the following values: EPQR-A Neuroticism Scale = 3.49

Figure 10. *The effects of self-report somnolence when compared to marginal means of total stress*

### *Conclusion*

Figure 10. Shows a distinct rise in stressful experiences as it relates to self reported levels of somnolence when controlling for Neuroticism. Therefore, the null is rejected.

### **H7) The relationship between scores on the MOS Sleep survey and Nursing Stress scale will be mediated by scores on the EPQR-A Extroversion scale.**

Three one way ANCOVA's were performed to investigate the mediating effect of extraversion as it relates to the relationship between Total Stress Experienced as reported by the Nursing Stress Scale and the three chosen dimensions of the MOS-Sleep Survey; Somnolence, Adequacy, and Average Nightly Hours.

#### *H7.1) Extroversion as covariate of reported nightly average sleep*

A one-way ANCOVA was conducted to examine the amount of stress experienced as it relates to the average hours sleep reported per night where extroversion was controlled for, which had a significant result ( $F(4,314) = 4.01, p = .003$ ). However, the covariate EPQR-A Extraversion subscale did not have a significant relationship with the dependent variable Total Stress Experienced with an effect size of .00 ( $F(1, 318) = .00, p < .955$ ).

*H7.2) Extroversion as covariate of reported sleep adequacy*

A one-way ANCOVA was conducted to examine the amount of stress experienced as it relates to self reported sleep adequacy where extroversion was controlled for, which had a significant result ( $F(3,300) = 5.60, p = .001$ ). However, the covariate EPQR-A Extraversion subscale did not have a significant relationship with the dependent variable Total Stress Experienced with an effect size of .00 ( $F(1, 300) = .056, p < .813$ ).

*H7.3) Extroversion as covariate of reported somnolence*

A one-way ANCOVA was conducted to examine the amount of stress experienced as it relates to the self-reported experiences of somnolence where extroversion was controlled for, which had a significant result ( $F(3,302) = 6.78, p = .000$ ). However, the covariate EPQR-A Extraversion subscale did not have a significant relationship with the dependent variable Total Stress Experienced with an effect size of .00 ( $F(1, 300) = .001, p < .971$ ).

*Conclusion*

Clear and inarguable evidence that EPQR-A Extroversion scale does not significantly account for any of the variance inherent in the relationship between frequency of experienced stress and adequacy, somnolence, or average hourly sleep has been provided. As such, the null for Hypothesis 7 is accepted.

**H8) Those respondents who report working the “night shift” either all or part of the time will report insufficient sleep and higher instances of stress.**

When investigating the effects of night shift work on total frequency of stressful experiences, a Mann Whitney U test revealed that the Only Day Shift (mean rank = 139.75)

cohort and the All or Partly Night Shift (mean rank = 189.85) cohort did differ significantly ( $z = -4.71, p = .000$ ).

Likewise, when investigating the effects of night shift work on self reported levels of somnolence, a Mann Whitney U test revealed that the Only Day Shift (mean rank = 147.16) cohort and the All or Partly Night Shift (mean rank = 193.59) cohort did differ significantly ( $z = -4.32, p = .000$ ). Further investigations revealed that night shift work did not significantly relate to self reports of sleep adequacy ( $z = -1.11, p = .910$ ) or reported nightly average sleep ( $z = -1.87, p = .061$ ), although nightly average sleep failed to meet significance criteria by only a small margin. Figures 11 & 12. Display the effect that shift work has on levels of stress (Figure 11) and somnolence (Figure 12).

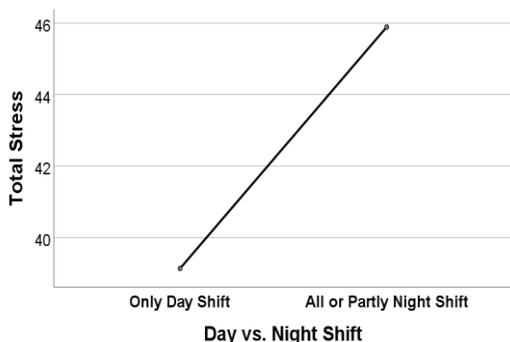


Figure 11. *Effect of shift work on total stress*

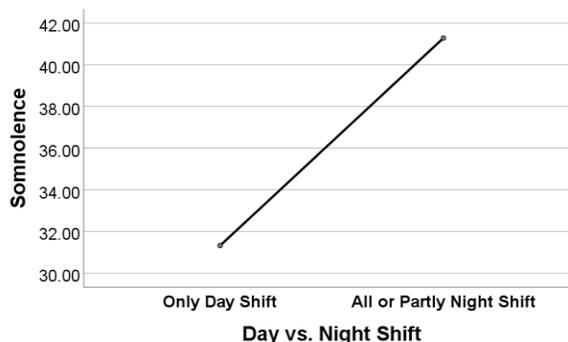


Figure 12. *Effect of shift-work on somnolence*

### *Conclusion*

Night shift displays a clear relationship to frequency of experienced stress and somnolence; however, night shift does not significantly affect the adequacy of respondents sleep, nor the total sleep amount. Given the results presented above, it is assumed that the null should be partly rejected.

**H9) Tenure will relate with personality type, frequency of experienced stress, and the quality and quantity of respondents sleep.**

A Spearman's Rho correlation showed that professional tenure had a significant inverse relationship to Total Experienced Stress ( $r = -.271$ ,  $n = 335$ ,  $p = .000$ ). Additionally, a battery of exploratory Kruskal-Wallis H tests showed that professional tenure displayed a relationship to self-reported sleep adequacy ( $\chi^2(3) = 8.02$ ,  $p = .046$ ) and also to self-reported levels of somnolence ( $\chi^2(3) = 8.91$ ,  $p = .030$ ). Although, tenure did not display a relationship to reported nightly average sleep ( $\chi^2(3) = 4.51$ ,  $p = .341$ ). A further round of Kruskal-Wallis H Tests were performed which showed EPQR-A Neuroticism to have a significant relationship with tenure ( $\chi^2(3) = 17.172$ ,  $p = .001$ ) (See Figure 12); although EPQR-A extroversion showed no significant effects in relation to Tenure ( $\chi^2(3) = 6.39$ ,  $p = .094$ )

Figure 13.

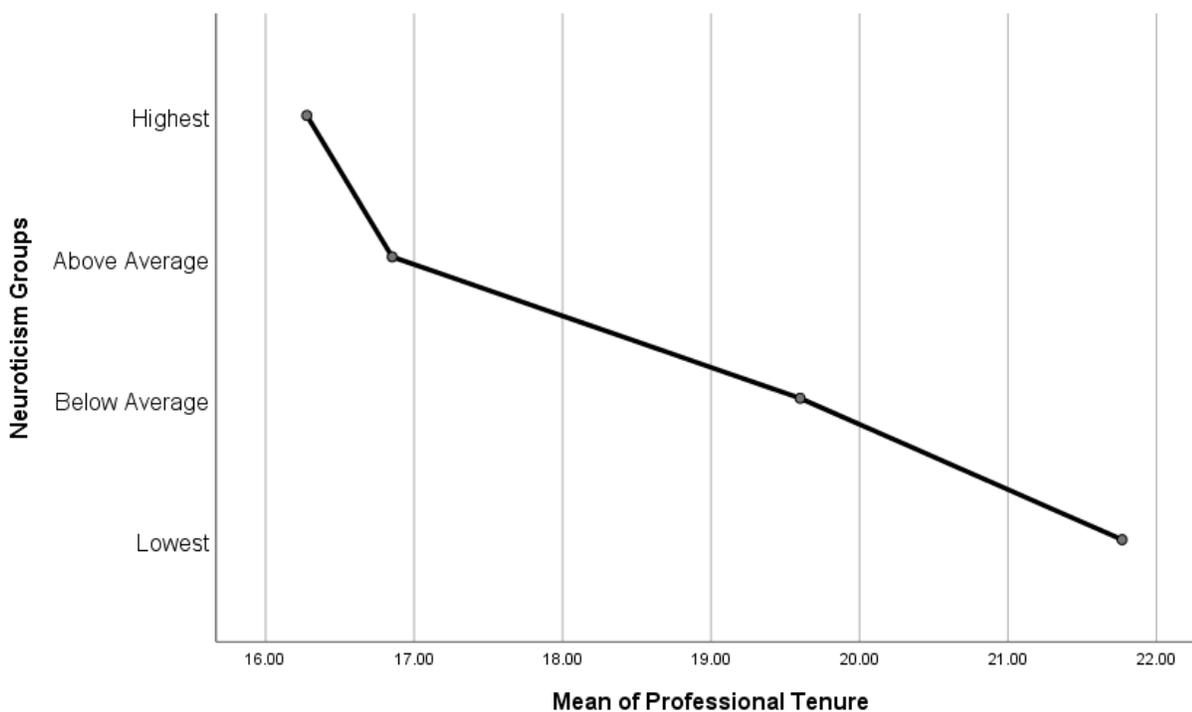


Figure 12. *The Mean Tenure in Years plotted against neuroticism groupings*

#### *Conclusion*

Tenure has a direct negative relationship to stress, although the effect size is small. Also, tenure has been shown to relate to the quality of respondents' sleep but not the quantity. Further, Tenure displays a significant relationship to personality trait neuroticism as measured by the

EPQR-A neuroticism scale. Therefore, the null must be partly rejected as tenure did not predict sleep quantity.

### *Supplementary Analysis*

#### *SA1) Age as it relates to sleep and stress*

A Kruskal-Wallis H test showed that age, when transformed into categorical subgroups, and the NSS total did differ significantly ( $\chi^2(3) = 32.00, p = .000$ ) (See figure 14). However, age only showed a significant effect with one of the three MOS-Sleep subscales. A battery of Kruskal-Wallis H tests showed that categorical age and somnolence did differ significantly ( $\chi^2(3) = 8.17, p = .043$ ); though adequacy ( $\chi^2(3) = 3.83, p = .280$ ) and nightly average sleep ( $\chi^2(3) = 1.81, p = .613$ ) did not.

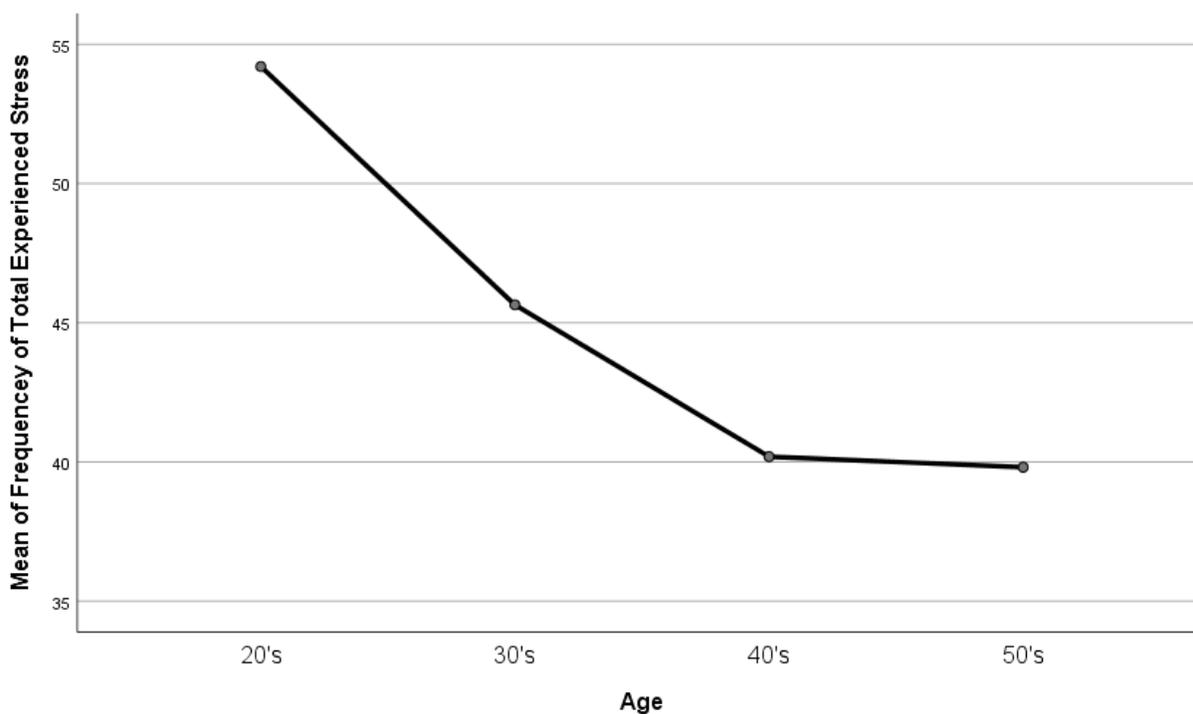


Figure 14. *Stress as a function of age*

*SA2) Impact of disruptive partners as it relates to sleep quality*

A battery of Kruskal-Wallis H tests showed that frequency of disruption by partner differed significantly with nightly average sleep ( $\chi^2(5) = 23.49, p = .000$ ) and sleep adequacy ( $\chi^2(5) = 21.37, p = .001$ ). However there was no significant effects found with somnolence ( $\chi^2(5) = 5.64, p = .343$ ) nor total frequency of stressful experiences ( $\chi^2(5) = 4.93, p = .425$ ).

## Discussion

The year 2020 has been designated *The Year of the Nurse and Midwife* by the WHO (Nkowane, & Ferguson, 2016). This research aims to contribute to the literature concerning stress and turnover in the nursing profession. The relationship between stress and sleep in the nursing profession was investigated while controlling for personological and organisational factors.

A link was found between scores on the NSS and the nightly average sleep, sleep adequacy, and somnolence subscales of the MOS-Sleep. Further, EPQR-A Neuroticism scale was found to be a significant mediator in the stress-sleep relationship; though, EPQR-A Extroversion did not have any significant effects. Additionally, nursing staff who operate some portion of the employment during the night time showed significant effects in relation to sleep variables. Additionally, tenure was found to be related to sleep quality, lower levels of stress, and neuroticism.

All but two of the proposed hypotheses were found to be at least partially acceptable. The two instances where the null was accepted involved the EPQR-A Extroversion scale which showed little to no relation to the stress or sleep variables.

### *Interpretation*

Hirshkowitz et al. (2015) described the optimal sleep range as being between 7-9 hours per night. However, the data provided above shows that only 6% of the studied cohort reported 7 or more hours sleep per night on average. This is cause for alarm given the data provided by Shwartz et al. (2018) concerning the accumulating effects of restricted sleep. According to Swratz et al.'s (2018) model, 25.3% of the studied cohort would be operating on a regular basis as though they had been forcibly deprived of sleep for 72 hours straight. This is problematic because nurse fatigue and impairment results in avoidable patient mortality (Kunert et al. 2007).

Burgess et al. (2010) showed evidence that there were no significant effects of neuroticism scores on levels of stress. Further, Burgess et al. (2010) showed a small protective effect from extroversion when dealing with some forms of social stressors. The data provided in hypotheses 4 & 5 explicit contradict burgess et al.'s (2010) data. Neuroticism was found to be a significant predictor of stress on the nursing stress scale in all sub subscales except "lack of

Support”. Additionally, extroversion displayed no significant effects in any of the analyses that were performed with the stress and sleep measures.

Akerstedt & Wright (2009) published evidence of pronounced sleep disturbances in shift workers. The analyses performed in Hypothesis 8 provided further evidence of the pronounced effects of shift work on an individual's sleep and stress levels.

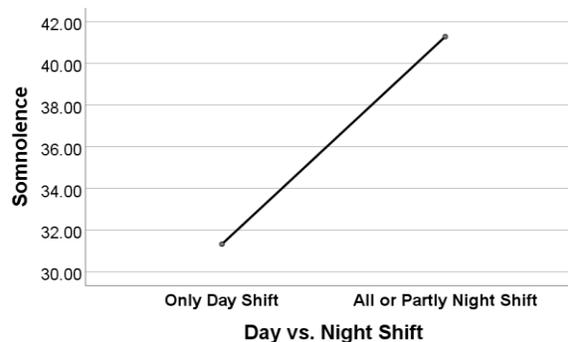
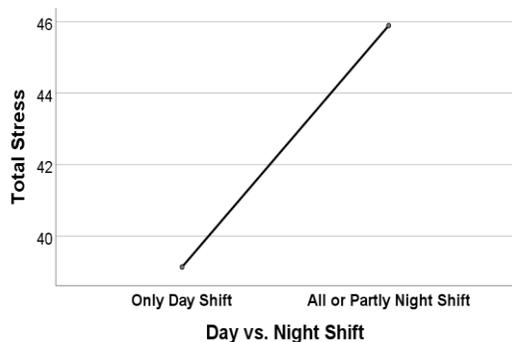


Figure 11. *Effect of shift work on total stress*      Figure 12. *Effect of shift-work on somnolence*

Hypotheses 1, 2, & 3 all display significant evidence that sleep and stress are intimately related. Hypothesis 1 shows the effect of sleep quantity on respondents stress levels. This is in line with research published by Halonen et al. (2017) whereby a causal link was inferred between disturbed sleep and work related stress. The data of hypothesis one does not have a directional element, however, additional analysis was performed which showed that levels of sleep disturbance by a spouse, partner, or bedfellow are not significantly related to respondents' scores on the NSS. Further, the data provided for Hypothesis 2 & 3 delve into this phenomenon by not just investigating sleep amount, but by showing that levels of somnolence and self reports of sleep adequacy are also significantly related to work stress.

The data provided in hypothesis 6 & 7 is unique to this study. The mediating effects of personality measures extraversion and neuroticism on the relationship between stress and sleep requires further study. This data suggests that a significant amount of the stress-sleep relationship is mediated by neuroticism, but not by extroversion.

As mentioned above, an additional analysis was performed to investigate the effects of on sleep levels and the related stress. Pace-schott et al (2015) show that restricted sleep can affect

levels of state neuroticism which in turn partially inhibits extinction learning in male college students. The younger divisions of this cohort of Irish nurses showed significantly higher levels of somnolence, although no significant relationship was found relating age to nightly average sleep nor sleep adequacy. As such, it is unclear if somnolence would affect extinction learning in young nurses.

### *Limitations*

This study was conducted in the midst of campaigns for nursing rights and data was collected in the aftermath of the 2019 nursing strikes in Ireland. Further, a large portion of the respondents were reached because survey distribution was facilitated by nursing advocacy groups and social media advocates for nursing rights. It is understandable, and even expected, that this cohort may be particularly forthcoming with their accounts of their experiences of stress in the nursing profession given that the resulting research may influence their future negotiations.

The EPQR-A psychoticism scale was found to be viable after the data was collected. This may be due a reluctance of the respondents to identify with some of the themes proposed by the psychoticism items. For instance: “I like people to be afraid of me” is very inconsistent with the ethos of being a nurse. By surveying a nursing population and asking them a series of nursing related questions beforehand the population may have been inadvertently primed to dis-identify with any psychotic tendencies they may display. Further, there were pronounced problems with the Lie scale also which may have suffered from the same inadvertent as the items characterise some less than ideal nursing related traits. A less abbreviated form the EPQR-A with a more robust Lie Scale and Psychoticism measure are recommended in any further investigations of personality in the nursing profession.

Resource and time constraints limited the scope of the survey that was feasible. Ideally, a study such as this would investigate sleep hygiene practices as a confounding variable. Despite not meeting the standards for parametric testing, an ANCOVA was used in the absence of a nonparametric equivalent. Further, given that the ANCOVA was not used to study two instances in time and instead was used to investigate two separate cohorts, the linear relationship assumption was discarded in line with Keppel's (1991) interpretation of the underlying ANCOVA assumptions when not used in a within groups scenario.

### *Strengths*

The sample size achieved was considerable and is assumed to be representative of the general nursing population in Ireland. There were almost no partial completions of the survey which shows a high level of engagement from the studied population. Both the stress and sleep variables showed high levels of reliability according to cronbach's alpha.

### *Future Research*

Further research should investigate the relationship between stability and tenure in a longitudinal design. If neuroticism is making the nursing profession untenable for particularly neurotic groups there may be targeted interventions which alleviate some of the negative consequences of having a neurotic personality type in the nursing profession. Likewise, a further investigation into the stress experienced in the nursing profession is needed. The NSS only measures the frequency of stressful experiences but there is no attempt to account for severity or persistence of stressful episodes. Finally, investigation of the actual quality and quantity of sleep in a sleep laboratory would be beneficial, given the problems inherent in self report estimates and varying definitions of commonly used sleep related parlance.

### *Implications and Applications*

The findings presented within are evidence of a significant relationship between sleep and stress in the nursing profession. This research may serve to inform any retention focused interventions by highlighting the importance of both sleep and personological factors in relation to stress in the nursing profession. Further, it may prove useful for trainee nursing cohorts to be given personality measures such as the EPQR-A. By illuminating and informing individuals about their own predispositions they may prioritise self-care and sleep hygiene routines which mitigate their stress responses before they become problematic. On an individual level, making research visible and available to those whom it concerns is incredibly important. The nursing community in Ireland is asking for acknowledgment, recognition, and help and it behoves the research community to respond.

### *Conclusion*

A link was found between stress and sleep, of which, a significant amount of the variance was accounted for by the personality factor neuroticism. Further, it appears the demands placed on nurses by rotating shift schedules places a significant amount of stress on the individual. Tenure has a protective role but this is possibly due to nurse turnover rates whereby the most resilient survive. Interventions targeting sleep hygiene and personological targeted coping strategies may increase nurse retention and mitigate the expected shortfall in the nursing profession.

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## *Appendix*

### Appendix A - Instructions Sheet

#### Stress and Sleep in the Nursing Profession

My name is Michael Gorman Mc Nicholas and I am conducting research in the Department of Psychology, Dublin Business School, that investigates sleep disturbance in the nursing profession. This research is being conducted as part of my studies and will be submitted for examination.

You are invited to take part in this study and participation involves completing and returning the attached anonymous survey. While the survey asks some questions that might cause some minor negative feelings, it has been used widely in research. If any of the questions do raise difficult feelings for you, contact information for support services are included on the final page.

Participation is completely voluntary and so you are not obliged to take part.

Participation is anonymous and confidential. Thus responses cannot be attributed to any one participant. For this reason, it will not be possible to withdraw from participation after the questionnaire has been collected.

The questionnaires will be securely stored on a password protected computer.

It is important that you understand that by completing and submitting the questionnaire that you are consenting to participate in the study.

Should you require any further information about the research, please contact Michael Gorman Mc Nicholas, . Alternatively, my supervisor can be contacted at

Thank you for taking the time to complete this survey.

## Appendix B -Debrief Sheet

## Stress and Sleep in the Nursing Profession - Please Share! :)

Thank you for completing this survey. By completing and sharing this survey you are aiding in important research which may help to improve quality of life in the nursing profession.

Link to share this survey:

<https://forms.office.com/Pages/ResponsePage.aspx?id=6qYKXSBmY0ieIz7LFAIivEpRhsR7ZKxDpj1MFSzMrRUQko5OTNWMVNNUIo0TDhIOUdLMD/MNVIUUC4u>

The intention of this research is to study the effect that experiences of stress have on Irish nurses sleep quality. The mediating role of personality traits is also being investigated. The hope is to inform nurses self care practices by illuminating the role that personality plays in mediating the felt effects of a stressful work environment.

If you are feeling emotionally drained by engaging with the survey provided it is recommended that you don't try to have any emotionally taxing encounters until you speak with someone. Please be aware that engaging with distressing emotions can affect your ability to make rational decisions and can even lead you to behave in a reactive manner.

If you feel like you need some guidance or support there are a number of resources listed below which may be able to help you through any negative feelings. There are also some resources which may help to inform your understanding of sleep and provide you with practical methods of improving sleep quality.

Support:

<https://www.samaritans.org/>

Information Regarding Workplace Bullying:

[https://www.hsa.ie/eng/Workplace\\_Health/Bullying\\_at\\_Work/Are\\_you\\_being\\_Bullied/](https://www.hsa.ie/eng/Workplace_Health/Bullying_at_Work/Are_you_being_Bullied/)

Sleep Links:

[www.sleepfoundation.org/](http://www.sleepfoundation.org/)

<http://healthysleep.med.harvard.edu/healthy/getting>

Thank you for your time.

Sleep Well,

Michael Gorman Mc Nicholas

If you have any further questions please dont hesitate to contact me at

## Appendix C -EPQR-A

Please answer the questions below as accurately as possible

	Yes	No
Does your mood often go up and down?	<input checked="" type="radio"/>	<input type="radio"/>
Are you a talkative person?	<input type="radio"/>	<input type="radio"/>
Would being in debt worry you?	<input type="radio"/>	<input type="radio"/>
Are you rather lively?	<input type="radio"/>	<input type="radio"/>
Were you ever greedy by helping yourself to more than your share of anything?	<input type="radio"/>	<input type="radio"/>
Would you take drugs which may have strange or dangerous effects?	<input type="radio"/>	<input type="radio"/>
Have you ever blamed someone for doing something you knew was really your fault?	<input type="radio"/>	<input type="radio"/>
Do you think marriage is old fashioned and should be done away with?	<input type="radio"/>	<input type="radio"/>
Do you often feel 'fed-up'?	<input type="radio"/>	<input type="radio"/>
Have you ever taken anything (even a pin or button) that belonged to someone else?	<input type="radio"/>	<input type="radio"/>
Would you call yourself a nervous person?	<input type="radio"/>	<input type="radio"/>
Do you enjoy cooperating with others?	<input type="radio"/>	<input type="radio"/>

	Yes	No
Can you easily get some life into a rather dull party?	<input type="radio"/>	<input type="radio"/>
Are you a worrier?	<input type="radio"/>	<input type="radio"/>
Do you tend to keep in the background on social occasions?	<input type="radio"/>	<input type="radio"/>
Do you try not to be rude to people?	<input type="radio"/>	<input type="radio"/>
Have you ever cheated at a game?	<input type="radio"/>	<input type="radio"/>
Do you suffer from 'nerves'?	<input type="radio"/>	<input type="radio"/>
Have you ever taken advantage of someone?	<input type="radio"/>	<input type="radio"/>
Are you mostly quiet when you are with other people?	<input type="radio"/>	<input type="radio"/>
Do you often feel lonely?	<input type="radio"/>	<input type="radio"/>
Would you like other people to be afraid of you?	<input type="radio"/>	<input type="radio"/>
Do other people think of you as being very lively?	<input type="radio"/>	<input type="radio"/>
Do you always practice what you preach?	<input type="radio"/>	<input type="radio"/>

## Appendix D -MOS-Sleep

How often during the past 4 weeks did you...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
feel drowsy or sleepy during the day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have trouble staying awake during the day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
take naps (5 minutes or longer) during the day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
get enough sleep to feel rested upon waking in the morning?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
get the amount of sleep you needed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below is a list of situations that commonly occur on a hospital unit. For each item indicate how often on your present unit you have found these situations to be stressful.

	Never	Occasionally	Frequently	Very frequently
Breakdown of computer	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Criticism by a physician	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing procedures that patients experience as painful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling helpless in the case of a patient who fails to improve	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflict with a supervisor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening or talking to a patient about his/her approaching death	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of an opportunity to talk openly with other unit personnel about problems on the unit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The death of a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflict with a physician	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear of making a mistake in treating a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of an opportunity to share experiences and feelings with other personnel on the unit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The death of a patient with whom you developed a close relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continued: For each item indicate how often on your present unit you have found these situations to be stressful.

	Never	Occasionally	Frequently	Very frequently
Physician not being present when a patient dies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disagreement concerning the treatment of a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling inadequately prepared to help with the emotional needs of a patient's family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of an opportunity to express to other personnel on the unit my negative feelings toward patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate information from a physician regarding the medical condition of a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being asked a question by a patient for which I do not have a satisfactory answer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making a decision concerning a patient when the physician is unavailable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Floating to other units that are short-staffed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Watching a patient suffer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty in working with a particular nurse (or nurses) outside the unit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling inadequately prepared to help with the emotional needs of a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Criticism by a supervisor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix C -EPQR-A

Continued: For each item indicate how often on your present unit you have found these situations to be stressful.

	Never	Occasionally	Frequently	Very frequently
Unpredictable staffing and scheduling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A physician ordering what appears to be inappropriate treatment for a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too many non nursing tasks required, such as clerical work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough time to provide emotional support to a patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty in working with a particular nurse (or nurses) on the unit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough time to complete all of my nursing tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A physician not being present in a medical emergency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not knowing what a patient or a patient's family ought to be told about the patient's condition and its treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uncertainty regarding the operation and functioning of specialized equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough staff to adequately cover the unit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>