

The Correlations between Work Stress, Job Satisfaction and Quality of Life among Nurse Anesthetists Working in Medical Centers in Southern Taiwan

Mei-Chin Chen¹, Ying-Wei Huang², Wen-Li Hou³, Chien-An Sun⁴,
Yu-Ching Chou⁵, Su-Feng Chu³, Tsan Yang^{6,*}

¹Department of Anesthesiology, Kaohsiung Medical University Chung-Ho Memorial Hospital, Kaohsiung, Taiwan

²Department of Dentistry, Kaohsiung Municipal Hsiaokang Hospital, Kaohsiung, Taiwan

³Department of Nursing, Meiho University, Pingtung County, Taiwan

⁴Department of Public Health, College of Medicine, Fu-Jen Catholic University, New Taipei City, Taiwan

⁵School of Public Health, National Defense Medical Center, Taipei City, Taiwan

⁶Department of Health Business Administration, Meiho University, Pingtung, Taiwan

*Corresponding author: tsan.yang@msa.hinet.net

Copyright © 2014 Horizon Research Publishing. All rights reserved.

Abstract The purpose of this study was to investigate the correlation between job stress, job satisfaction, and quality of life for nurse anesthetists at medical centers in Southern Taiwan. The study adopted a cross-sectional study design. The interviewees were nurse anesthetists at three medical centers in Southern Taiwan who had been employed in their respective units for over 6 months. The recruitment period was from January 2012 to March 2012. Data was collected using a structured questionnaire composed of the following sections: basic personal characteristics, perceived source of job stress for medical work scale, job satisfaction for nurses scale, and SF-36 quality of life scale. A total 150 nurses participated in the study. The results showed a statistically significant difference in monthly overtime amounts in relation to overall job stress. Hospital, age, work place, overtime amount, intention to resign, and nurse anesthetist work terms also showed significant differences in relation to subjects' overall job satisfaction. After using stepwise multiple regression, the average quality of life score for subjects with intention to resign was 8.231 points lower than that of those without such intention; for each increase of 1 point in the "overall job satisfaction" section, the score for quality of life rose by 0.481 points; those with exercise habits scored 5.942 points higher than those without; those in a subspecialty showed an average score of 5.287 points higher than those without. In conclusion, intention to resign, overall job satisfaction, exercise habits, and having a subspecialty are the critical factors influencing quality of life among anesthesia nurses.

Keywords Anesthesia Nurses, Work Stress, Job Satisfaction, Quality of Life

1. Introduction

Due to modernization and the increasing use of advanced technologies, competition in the workplace has become increasingly fierce, and physical, mental and spiritual problems caused by work-related stress have also increased. Work stress can lead to low levels of job satisfaction, high rates of undesirable events and unfavorable physical and mental health outcomes (1). In the 21st century, one of the main factors endangering health is high work stress (2, 3), and nursing is among the high-pressure fields (4-6). High work stress can also result in high turnover rates and low quality of care and organizational efficiency (7-9). When work stress is greater, job satisfaction will be lower, resulting in a negative impact on physical and mental health. Such stress might also lead to different diseases and higher rates of burnout and turnover intention. Hospital nurses often suffer from burnout due to work stress and a lack of job satisfaction, both of which may lead to turnover intention (10-16). Therefore, the impact of risk factors that could affect the work stress of medical personnel and preventative measures against such stress are worthy of exploration (17-19). Nursing is a service that is relevant to the lives of most people, and therefore the work stress of nurses is typically higher than that experienced by other professionals, and since patients are now requesting better quality of care, the quality of service provided affects not only the satisfaction of patients, but also an employee's internal sense of satisfaction. Thus, work stress, job satisfaction and quality of life are closely related for nursing staff (19, 20).

When exploring the work-related stress of nurses in the past, research has mainly focused on clinical nurses as the subjects for study. Since the nursing field is broad, however, the nature of work and its contents are different in

anesthesiology units than in other areas of nursing. Nurse anesthetists are often exposed to the high pressures of changes in patients' vital signs, and when faced with different surgical procedures and patients with individual anesthesia histories, they are required to maintain a high degree of vigilance and often need to work under great pressure. Therefore, this study aimed to investigate the basic attributes of nurse anesthetists, as well as their levels of work stress, job satisfaction and quality of life. In addition, the present study also was to determine the factors influencing the quality of life of nurse anesthetists.

2. Methods

Literature shows that nursing is a job with high work stress, which endangers physical health and causes low job satisfaction, the high occurrence of adverse events, high turnover rates, low quality of care, and low organizational efficiency. It also negatively influences physical and psychological health and may lead to different diseases, thus affecting nurses' quality of life. This study explored the effect of basic attributes, work stress, and job satisfaction on the quality of life of nurse anesthetists in the hopes of understanding the factors influencing nurse anesthetists' quality of life in order to propose improvement strategies and further enhance the quality of care of patients

2.1. Study Design

This study used a cross-sectional study design and a structured questionnaire to collect data. During the data collection period from January 2012 to March 2012, a total of 192 questionnaires were given out, of which 160 questionnaires were collected. After deleting 10 questionnaires with incomplete data, there were a total of 150 valid samples, for an effective response rate of 78.13%.

2.2. Participants

This study selected nurse anesthetists from major medical centers in southern Taiwan as our study subjects. It has been noted that medical centers in Taiwan treat a more diversified range of patients, which could better reflect the working styles of nurse anesthetists from various departments. The subjects in this study were nurse anesthetists working at three medical centers in southern Taiwan who had been at their respective workplaces for six months or more. In order to ensure the equity and ethics of the study, it was first approved by the Institutional Review Board (IRB). The study was also explained to the subjects before they received the questionnaire survey, and they were asked to provide their signed consent prior to participating.

2.3. Instruments

The study used a structured questionnaire consisting of

four parts. The first part asked for basic personal information, including gender, age, education level, training, marital status, number of children, religion, title, place of work, whether the respondent had received a nurse anesthetist training certificate, subspecialty attribute (nurse anesthetists who focus on a subspecialty as their main anesthesiological works were defined as having subspecialty attributes. By contrast, nurse anesthetists without subspecialty attributes need to support various surgical anesthesiological works), total years of experience in nursing, total years of experience as a nurse anesthetist, years of experience in the anesthesia department in a hospital, whether the work is full-time or by contract, in fixed or in variable shifts, whether the respondent does part-time administrative work, turnover intention, overtime hours, whether the respondent exercises or not, and total annual salary. The second part consisted of the Questionnaire of Medical Workers' Stress (QMWS), which was developed according to the working environments for Taiwanese medical staffs. The scale includes eight work stress sources: maintaining the operations of medical institutions, coping with hospital evaluation work, maintaining patient stability, maintaining patient relationships, facing medical malpractice disputes, salary payment systems, personal evaluation systems, promotions, and academic research. The question responses were rated from 1, meaning "definitely not a stressor," to 6, meaning "definitely a stressor." The higher the score, the greater the feeling of work stress, and conversely, the lower the score, the lower the feeling of work stress (18). The third part of the questionnaire was the nurse's job satisfaction scale. The scale was developed specifically for the nurses and it included four dimensions: interpersonal relations, benefits and promotion, working conditions and workload. The scale had a total of 18 questions, with responses rated from 5, meaning "very satisfied," to 1, meaning "very unsatisfied." Thus, the higher the score, the greater the job satisfaction and vice versa (21). The fourth part was the SF-36 quality of life scale. The Taiwan version of the SF-36 was directly authorized for translation by Dr. John Ware, Jr, the scale's developer from the United States, and Professor Lu Rui-Fen was commissioned to be responsible for the Taiwan version. It included the two aspects of a physical component summary (PCS) and a mental component summary (MCS), as well as eight dimensions, with a total of 36 questions. The eight dimensions were as follows: physical functioning (PF), role limitation due to physical problems (RP), bodily pain (BP), general health (GH), vitality (VT), role limitation due to emotional problems (RE), social functioning (SF), and mental health (MH). It was graded according to 3-point, 5-point, and 6-point Likert Scales, with the potential total score ranging from 35-145 points. The scores for each dimension needed to be converted into standard scores, and after the conversion, the standard score for each dimension was 100 points. If a total score of 50 or more was reached, then it represents a good quality of life. The higher the score, the better the quality of life, while lower scores indicate a lower quality of life (22).

2.4. Statistical Analyses

This study used SPSS for Windows release 17.0 for data analysis, collected independent t-test samples, and used one way ANOVA and stepwise multiple regressions to understand the attributes, work stress, job satisfaction, and impacts on quality of life for nurse anesthetists.

3. Results

The 150 respondents who participated in this study were exclusively female. As shown in Table 1, the overall feeling of work stress from various sources among the nurse anesthetists had a mean score of 34.33 ± 6.25 . The perceived stress scores for the "facing medical malpractice" item reached an average of 4.92 ± 1.06 , which was followed by the scores for "coping with hospital accreditation work." In the case of job satisfaction scores, the overall feeling of job satisfaction had a mean score of 54.46 ± 8.39 . Among the individual job satisfaction items, "human relationships" had the highest satisfaction score with an average of 3.31 ± 0.51 , followed by "working environment." The highest scoring quality of life item was "physical functioning (PF)," followed by "social functioning (SF)." The lowest scoring quality of life item was "vitality (VT)," followed by "general health (GH)." When comparing 2 dimensions, the score of quality of life in terms of PCS was higher than the score in terms of MCS (50.36 ± 7.90 vs. 41.12 ± 9.27).

Among the basic attributes of nurse anesthetists, "overtime hours" and "overall work stress score" showed statistically significant differences ($p = .020$), and after Scheffe's post hoc analysis, overtime hours equal to or greater than 40 hours resulted in a higher work stress than overtime hours between 20 and 39 hours and overtime hours of less than 20 hours. Those with turnover intention also had a higher "overall work stress score" than those who did not have turnover intention, reaching the borderline of being statistically different ($p = .052$) (Table 2).

As shown in Table 3, the overall job satisfaction at B Medical Center was higher than that at both A Medical Center and C Medical Center ($p < .001$). Nurses of an age ≥ 41 years old had higher overall job satisfaction than those between the ages of 31 and 40 years old ($p = .045$). Those whose work place was in the recovery room and other places (such as in patient-controlled analgesia (PCA)) or a postoperative room) had higher overall job satisfaction than those who work in the operating room ($p = .030$). Those who worked less than 20 hours of overtime had an overall work

satisfaction higher than those with 20-39 overtime hours and those with equal to or greater than 40 hours of overtime. It was found that as overtime hours increased, job satisfaction decreased ($p < .001$). Those with no turnover intention had a higher overall job satisfaction than those who have turnover intention ($p < .001$). Those with 20 to 29 years of experience in anesthesia care had higher overall job satisfaction than those with 10 to 19 years of experience ($p = .046$).

As shown in Table 4, the "PCS" dimension was higher for those nurse anesthetists with no turnover intention than for those who had turnover intention ($p = .011$), while the "MCS" dimension was greater for those with an age ≥ 41 years than for those aged 31-40 ($p = .003$). MCS was also greater for those with a spouse than those for without a spouse ($p = .041$), for those whose jobs were by contract than for those who were full-time ($p = .032$), for those with subspecialty attributes than for those without ($p = .042$), for those with no turnover intention than for those with turnover intention ($p < .001$), for those with a total of 20-29 years of nursing experience than for those with a total of 10-19 years ($p = .021$), and for those with a total of 20-29 years of hospital anesthesia experience than for those with 0-9 years of experience ($p = .016$). In terms of "SF36 overall quality of life," those with exercise habits had a higher overall quality of life than those without exercise habits ($p = .010$). Those whose job was by contract had a higher overall quality of life than full-timers. Those with subspecialty attributes had a greater overall quality of life than those without ($p = .015$), and those who had no turnover intentions also had a greater overall quality of life than those with turnover intentions ($p < .001$).

This study used stepwise multiple regression analysis to conduct an analysis of important factors affecting the overall quality of life; the results are shown in Table 5. Individuals with turnover intention, overall job satisfaction score, exercise habits, a subspecialty were entered into the regression model. The regression model could effectively predict 33.4% of the variance in the overall quality of life and the regression effect was statistically significant. In terms of turnover intention score, the quality of life score of those with an intention to leave decreased by 8.231 points compared to those with no intention to leave. In terms of overall job satisfaction score, for each 1 point increase in overall job satisfaction, the quality of life score increased by 0.481 points. The quality of life scores of individuals with exercise habits increased by 5.942 points compared to those who with no exercise habits, and the quality of life score of those with subspecialty attributes increased by 5.287 points compared to those with no subspecialty attributes.

The Correlations between Work Stress, Job Satisfaction and Quality of Life among Nurse Anesthetists
Working in Medical Centers in Southern Taiwan

Table 1. Descriptive statistics of medical work stressors, nursing job satisfaction, and SF-36 quality of life (N = 150)

| Work stress source categories | Mean±Standard Deviation | | Order | Job Satisfaction | Mean±Standard Deviation | | Order | Quality of Life | Mean±Standard Deviation | | Order |
|-------------------------------------|-------------------------|-------|-------|--------------------------|-------------------------|-------|--|---|-------------------------|--------|-------|
| | | | | | | | | | | | |
| Maintain hospitals operation | 3.64 | ±1.09 | 8 | Job environment | 3.10 | ±0.73 | 2 | PCS Physical Component summary | 50.36 | ±07.09 | |
| Cope with hospital evaluation work | 4.76 | ±1.08 | 2 | Human relationships | 3.31 | ±0.51 | 1 | PF physical functioning | 85.03 | ±16.07 | 1 |
| Patients stability | 4.55 | ±1.10 | 3 | Benefits and promotions | 2.85 | ±0.57 | 3 | RP Role limitation due to physical problems | 63.33 | ±39.57 | 5 |
| Maintain relationship with patients | 3.97 | ±1.12 | 7 | Workload | 2.56 | ±0.65 | 4 | BP bodily pain | 70.36 | ±20.42 | 3 |
| Facing medical malpractice | 4.92 | ±1.06 | 1 | Overall job satisfaction | 54.46 | ±8.39 | | GH general health | 53.49 | ±18.10 | 7 |
| Salary payment system | 4.16 | ±1.15 | 5 | | | | MCS mental component summary | 41.12 | ±09.27 | | |
| Individual assessment system | 4.25 | ±1.09 | 4 | | | | VT vitality | 50.74 | ±17.98 | 8 | |
| Promotion or academic research | 4.09 | ±1.08 | 6 | | | | SF social function | 70.83 | ±16.75 | 2 | |
| Overall work stress score | 34.33 | ±6.25 | | | | | RE Role limitation due to emotional problems | 65.11 | ±40.93 | 4 | |
| | | | | | | | MH Mental Health | 59.53 | ±13.80 | 6 | |

Table 2. The differences in overall health care work stress sources associated with basic attributes of nurse anesthetist in southern medical centers (N = 150)

| Variables | Overall work stress score | | P value | Variables | Overall work stress score | | P value |
|--------------------|---------------------------|-------|---------|----------------|---------------------------|-------|---------|
| | Mean±SD | | | | Mean±SD | | |
| Hospital | | | .885 | Subspecialty | | | .053 |
| ① A Medical Center | 34.63 | ±5.48 | | Yes | 32.15 | ±7.69 | |
| ② B Medical Center | 34.31 | ±5.78 | | No | 34.77 | ±5.85 | |
| ③ C Medical Center | 34.02 | ±7.44 | | | | | |
| Age | | | .658 | Working Shifts | | | .152 |
| ① ≦ 30 years old | 34.00 | ±4.61 | | Fixed | 33.05 | ±6.09 | |
| ② 31-40 years old | 34.83 | ±6.35 | | Rotations | 34.76 | ±6.27 | |
| ③ ≧ 41 years old | 33.83 | ±6.62 | | | | | |
| Education | | | .180 | Overtime hours | | | .020 |
| ① College or less | 32.47 | ±7.35 | | ① < 20 hours | 33.39 | ±6.14 | ③ > ① |
| ② University | 34.86 | ±5.87 | | ② 20-39 hours | 34.86 | ±6.19 | ③ > ② |
| ③ Master | 34.27 | ±6.21 | | ③ ≧ 40 hours | 39.63 | ±5.71 | |
| Currently studying | | | .388 | Job Title | | | .402 |

| | | | | | | | |
|--|-------|-------|------|--|-------|-------|------|
| No | 34.46 | ±6.29 | | Leader or above | 33.00 | ±7.16 | |
| Yes | 32.83 | ±5.77 | | Nurses | 34.43 | ±6.15 | |
| Marital status | | | .806 | Part-time administrative work | | | .242 |
| No spouse | 34.49 | ±5.47 | | No | 34.19 | ±6.19 | |
| Spouse | 34.23 | ±6.72 | | Yes | 36.06 | ±5.77 | |
| Number of children | | | .714 | Turnover Intention | | | .052 |
| ① 0 | 34.80 | ±6.00 | | No | 33.54 | ±6.12 | |
| ② 1 | 33.74 | ±5.81 | | Yes | 35.55 | ±6.17 | |
| ③ 2 or more | 34.09 | ±6.78 | | | | | |
| Religion | | | .397 | Years of nursing experience | | | .407 |
| No | 34.82 | ±6.52 | | ① 0-9 years | 33.96 | ±5.54 | |
| Yes | 33.94 | ±6.04 | | ② 10-19 years | 35.43 | ±6.27 | |
| | | | | ③ 20-29 years | 34.10 | ±5.91 | |
| Exercise habits | | | .863 | Years of Nurse Anesthetists experience | | | .286 |
| No | 34.38 | ±6.53 | | ① 0-9 years | 34.40 | ±5.98 | |
| Yes | 34.17 | ±5.33 | | ② 10-19 years | 35.30 | ±5.79 | |
| | | | | ③ 20-29 years | 33.06 | ±7.45 | |
| Location | | | .383 | Years of hospital anesthesia | | | .289 |
| Operating Room | 34.50 | ±6.26 | | ① 0-9 years | 34.63 | ±6.17 | |
| Recovery room and other (PCA) | 33.16 | ±6.24 | | ② 10-19 years | 35.00 | ±5.23 | |
| | | | | ③ 20-29 years | 32.81 | ±7.66 | |
| Employment status | | | .878 | Annual Salary | | | .123 |
| Official employment | 34.35 | ±6.23 | | ① 610 thousand and less | 35.95 | ±5.64 | |
| By contract | 34.00 | ±6.99 | | ② 610-800 thousand | 34.38 | ±6.08 | |
| Nurse Anesthetist training certificate | | | .761 | ③ 810 thousand or more | 33.11 | ±6.80 | |
| No | 33.93 | ±6.42 | | | | | |
| Yes | 34.33 | ±6.24 | | | | | |

Note: Two groups uses an independent samples t test and two-tailed test with a significance level of $\alpha = .05$; three groups or more uses ANOVA(Post-test uses Scheffe)

The Correlations between Work Stress, Job Satisfaction and Quality of Life among Nurse Anesthetists
Working in Medical Centers in Southern Taiwan

Table 3. Analysis of differences in overall job satisfaction in relation to basic attributes of nurse anesthetist in southern medical centers (N = 150)

| Variables | Overall work stress score | | P value | Variables | Overall work stress score | | P value |
|--------------------|---------------------------|-------|---------|--|---------------------------|--------|---------|
| | Mean±SD | | | | Mean±SD | | |
| Hospital | | | <.001 | Subspecialty | | | .891 |
| ① A Medical Center | 53.75 | ±8.42 | ②>① | Yes | 54.35 | ±6.15 | |
| ② B Medical Center | 59.08 | ±6.26 | ②>③ | No | 54.60 | ±8.80 | |
| ③ C Medical Center | 51.57 | ±8.44 | | | | | |
| Age | | | .045 | Working Shifts | | | .026 |
| ① ≤ 30 years old | 54.00 | ±7.70 | ③>② | Fixed | 56.88 | ±6.52 | |
| ② 31-40 years old | 52.81 | ±9.50 | | Rotations | 53.69 | ±8.79 | |
| ③ ≥ 41 years old | 56.61 | ±6.68 | | | | | |
| Education | | | .673 | Overtime hours | | | <.001 |
| ① College or less | 55.10 | ±9.28 | | ① < 20 hours | 56.86 | ±7.23 | ①>②>③ |
| ② University | 54.50 | ±8.15 | | ② 20-39 hours | 52.91 | ±7.70 | |
| ③ Master | 52.45 | ±8.63 | | ③ ≥ 40 hours | 44.38 | ±13.72 | |
| Currently studying | | | .393 | Job Title | | | .997 |
| No | 54.28 | ±8.52 | | Leader or above | 54.50 | ±9.03 | |
| Yes | 56.55 | ±6.70 | | Nurses | 54.51 | ±8.37 | |
| Marital status | | | .202 | Part-time administrative work | | | .547 |
| No spouse | 53.31 | ±8.88 | | No | 54.36 | ±8.40 | |
| Spouse | 55.17 | ±8.05 | | Yes | 55.79 | ±8.25 | |
| Number of children | | | .082 | Turnover Intention | | | <.001 |
| ① 0 | 52.66 | ±9.15 | | No | 56.95 | ±6.69 | |
| ② 1 | 55.81 | ±7.99 | | Yes | 51.09 | ±9.29 | |
| ③ 2 or more | 55.85 | ±7.37 | | | | | |
| Religion | | | .937 | Years of nursing experience | | | .056 |
| No | 54.52 | ±9.59 | | ① 0-9 years | 55.39 | ±6.94 | |
| Yes | 54.41 | ±7.35 | | ② 10-19 years | 52.24 | ±9.70 | |
| | | | | ③ 20-29 years | 55.85 | ±6.59 | |
| Exercise habits | | | .113 | Years of Nurse Anesthetists experience | | | .046 |

| | | | | | | | |
|--|-------|--------|------|------------------------------|-------|-------|------|
| No | 53.85 | ±8.53 | | ① 0-9 years | 54.55 | ±7.86 | ③>② |
| Yes | 56.53 | ±7.68 | | ② 10-19 years | 52.42 | ±9.04 | |
| | | | | ③ 20-29 years | 57.27 | ±8.08 | |
| Location | | | .030 | Years of hospital anesthesia | | | .130 |
| Operating Room | 53.70 | ±7.85 | | ① 0-9 years | 53.77 | ±9.15 | |
| Recovery room and other (PCA) | 59.37 | ±10.18 | | ② 10-19 years | 53.59 | ±6.96 | |
| | | | | ③ 20-29 years | 57.24 | ±8.11 | |
| Employment status | | | .126 | Annual Salary | | | .101 |
| Official employment | 54.20 | ±8.48 | | ① 610 thousand and less | 52.62 | ±8.29 | |
| By contract | 58.88 | ±5.30 | | ② 610-800 thousand | 53.94 | ±8.30 | |
| Nurse Anesthetist training certificate | | | | ③ 810 thousand or more | 56.69 | ±8.17 | |
| No | 55.82 | ±9.76 | .342 | | | | |
| Yes | 54.13 | ±8.07 | | | | | |

Note: Two groups uses independent samples t test and two-tailed test with a significance level of $\alpha = .05$; three groups or more uses ANOVA (post-test uses Scheffe

Table 4a. Differences in quality of life associated with basic attributes of nurse anesthetist in southern medical centers (N = 150)

| Quality of Life Variable | PCS | | MCS | | SF36 Overall Mean±SD | Quality of Life P value |
|--------------------------|-------------|---------|--------------|---------|----------------------|-------------------------|
| | Mean±SD | P value | Mean±SD | P value | | |
| Hospital | | .393 | | .571 | | .176 |
| ① A Medical Center | 49.25 ±9.05 | | 40.12 ±10.40 | | 106.07± | 13.22 |
| ② B Medical Center | 51.36 ±7.36 | | 41.58 ±8.10 | | 111.45± | 13.49 |
| ③ C Medical Center | 51.00 ±6.68 | | 42.01 ±8.63 | | 109.46± | 13.95 |
| Age | | .091 | | .003 | | .145 |
| ① ≤ 30 years old | 53.94 ±3.85 | | 40.30 ±7.62 | ③>② | 111.23± | 9.03 |
| ② 31-40 years old | 50.63 ±8.22 | | 38.67 ±9.65 | | 106.15± | 14.61 |
| ③ ≥ 41 years old | 48.81 ±8.11 | | 44.66 ±8.45 | | 110.84± | 13.35 |
| Education | | .404 | | .318 | | .076 |
| ① College or less | 48.60 ±8.16 | | 42.92 ±9.80 | | 108.83± | 15.66 |
| ② University | 50.71 ±7.74 | | 40.36 ±8.89 | | 107.99± | 12.53 |
| ③ Master | 51.74 ±8.83 | | 43.48 ±11.21 | | 112.82± | 18.06 |

The Correlations between Work Stress, Job Satisfaction and Quality of Life among Nurse Anesthetists Working in Medical Centers in Southern Taiwan

| | | | | | | | | | |
|--|------------|-------|------|------------|--------|------|--------------|-------|------|
| Currently studying | | | .184 | | | .287 | | | .056 |
| No | 50.08 | ±7.94 | | 40.86 | ±9.13 | | 107.85± | 13.39 | |
| Yes | 53.40 | ±7.16 | | 43.98 | ±10.75 | | 116.02± | 14.54 | |
| Marital status | | | .415 | | | .041 | | | .087 |
| No spouse | 51.04 | ±7.70 | | 39.14 | ±9.76 | | 106.09± | 12.97 | |
| Spouse | 49.89 | ±8.06 | | 42.49 | ±8.71 | | 110.22± | 13.88 | |
| Number of children | | | .113 | | | .061 | | | .055 |
| ① 0 | 51.67 | ±7.22 | | 39.25 | ±9.70 | | 107.26± | 13.74 | |
| ② 1 | 47.70 | ±8.92 | | 41.02 | ±7.99 | | 104.46± | 12.81 | |
| ③ 2 or more | 50.01 | ±8.02 | | 43.46 | ±8.92 | | 111.99± | 13.30 | |
| Religion | | | .781 | | | .587 | | | .871 |
| No | 50.14 | ±8.12 | | 41.62 | ±10.02 | | 108.75± | 15.48 | |
| Yes | 50.53 | ±7.78 | | 40.73 | ±8.68 | | 108.36± | 12.07 | |
| Exercise habits | | | .105 | | | .308 | | | .010 |
| No | 49.77 | ±8.13 | | 40.68 | ±9.44 | | 106.92± | 13.89 | |
| Yes | 52.46 | ±6.73 | | 42.67 | ±8.61 | | 114.25± | 11.00 | |
| Location | | | .074 | | | .274 | | | .725 |
| Operating Room | 50.86 | ±7.6 | | 40.76 | ±9.23 | | 108.70± | 13.99 | |
| Recovery room and other (PCA) | 47.36±9.18 | | | 43.28±9.46 | | | 107.51±11.40 | | |
| Employment status | | | .115 | | | .032 | | | .050 |
| Official employment | 50.10 | ±7.96 | | 40.92 | ±9.45 | | 107.98± | 13.64 | |
| By contract | 54.94 | ±5.16 | | 44.71 | ±3.49 | | 118.34± | 9.11 | |
| Nurse Anesthetist training certificate | | | .978 | | | .362 | | | .483 |
| No | 50.27 | ±6.82 | | 39.70 | ±10.75 | | 106.87± | 13.40 | |
| Yes | 50.32 | ±8.20 | | 41.49 | ±8.56 | | 108.87± | 13.14 | |

Note: Two groups uses independent samples t test and two-tailed test with a significance level of $\alpha = .05$; three groups or more uses ANOVA (post-test uses Scheffe)

Table 4b. Differences in quality of life associated with basic attributes of nurse anesthetist in southern medical centers (cont.) (N = 150)

| Quality of Life Variable | PCS | | MCS | | SF36 Overall Quality of Life | |
|--|--------------|---------|--------------|---------|------------------------------|---------|
| | Mean±SD | P value | Mean±SD | P value | Mean±SD | P value |
| Subspecialty | | .147 | | .042 | | .015 |
| Yes | 52.03 ±5.79 | | 44.52 ±8.33 | | 114.48± 12.90 | |
| No | 49.95 ±8.33 | | 40.32 ±9.37 | | 107.15± 13.52 | |
| Working Shifts | | .244 | | .238 | | .711 |
| Fixed | 48.97 ±9.11 | | 42.77 ±9.42 | | 109.29± 13.66 | |
| Rotations | 50.82 ±7.45 | | 40.57 ±9.20 | | 108.27± 13.66 | |
| Overtime hours | | .589 | | .273 | | .179 |
| ① < 20 hours | 51.57 ±7.17 | | 40.76 ±8.02 | | 109.55± 11.09 | |
| ② 20-39 hours | 50.49 ±8.20 | | 41.83 ±10.23 | | 109.72± 15.13 | |
| ③ ≥ 40 hours | 48.98 ±7.26 | | 35.85 ±11.96 | | 99.70± 21.55 | |
| Job Title | | .684 | | .808 | | .982 |
| Leader or above | 49.56 ±7.14 | | 41.75 ±11.93 | | 108.48± 16.98 | |
| Nurses | 50.48 ±8.04 | | 41.11 ±8.97 | | 108.57± 13.30 | |
| Part-time administrative work | | .407 | | .167 | | .807 |
| No | 50.51 ±7.61 | | 40.68 ±9.12 | | 108.35± 13.46 | |
| Yes | 48.64 ±10.55 | | 44.34 ±10.66 | | 109.30± 15.88 | |
| Turnover Intention | | .011 | | <.001 | | <.001 |
| No | 51.87 ±7.66 | | 44.35 ±7.35 | | 114.02± 12.29 | |
| Yes | 48.32 ±7.89 | | 37.16 ±10.04 | | 101.64± 12.28 | |
| Years of nursing experience | | .062 | | .021 | | .225 |
| ① 0-9 years | 53.69 ±4.61 | | 39.54 ±9.00 | ③>② | 110.14± 11.20 | |
| ② 10-19 years | 50.09 ±8.53 | | 39.13 ±9.93 | | 106.11± 15.53 | |
| ③ 20-29 years | 48.96 ±8.26 | | 44.03 ±7.05 | | 110.33± 10.61 | |
| Years of Nurse Anesthetists experience | | .534 | | .103 | | .236 |
| ① 0-9 years | 51.18 ±7.39 | | 39.84 ±8.57 | | 107.78± 12.40 | |
| ② 10-19 years | 49.44 ±8.83 | | 40.70 ±10.19 | | 107.26± 15.81 | |
| ③ 20-29 years | 50.57 ±6.99 | | 44.52 ±8.98 | | 112.70± 11.95 | |

The Correlations between Work Stress, Job Satisfaction and Quality of Life among Nurse Anesthetists
Working in Medical Centers in Southern Taiwan

| | | | | | | | | | |
|------------------------------|-------|-------|------|-------|-------|------|---------|-------|------|
| Years of hospital anesthesia | | | .306 | | | .016 | | | .304 |
| ① 0-9 years | 51.35 | ±7.60 | | 39.17 | ±8.85 | ③>① | 107.47± | 13.85 | |
| ② 10-19 years | 48.92 | ±8.51 | | 42.21 | ±9.59 | | 108.23± | 14.05 | |
| ③ 20-29 years | 50.03 | ±7.77 | | 45.17 | ±8.84 | | 112.43± | 12.17 | |
| Annual Salary | | | .549 | | | .301 | | | .614 |
| ① 610 thousand and less | 51.52 | ±7.97 | | 39.32 | ±9.82 | | 107.74± | 15.22 | |
| ② 610-800 thousand | 50.31 | ±8.21 | | 40.96 | ±8.97 | | 107.83± | 13.91 | |
| ③ 810 thousand or more | 49.48 | ±7.17 | | 42.78 | ±9.10 | | 110.56± | 11.37 | |

Note: Two groups uses independent samples t test and two-tailed test with a significance level of $\alpha = .05$; three groups or more uses ANOVA (post-test uses Scheffé)

Table 5. Stepwise regression analysis of factors associated with overall quality of life of nurse anesthetist in southern medical centers (N = 150)

| Variables | Non-standardized regression coefficients (B) | Standardized regression coefficients (β) | R ² | ΔR^2 | t | F |
|--------------------------------|--|--|----------------|--------------|-----------|-----------|
| Constant | 83.956 | | | | 11.248*** | |
| Turnover intention a | -8.231 | -0.300 | 0.197 | 0.197 | -3.732*** | 30.176*** |
| Overall job satisfaction score | 0.481 | 0.297 | 0.278 | 0.081 | 3.739*** | 23.452*** |
| Exercise habits b | 5.942 | 0.182 | 0.311 | 0.033 | 2.423* | 18.173*** |
| Subspecialty attributes c | 5.287 | 0.155 | 0.334 | 0.023 | 2.051* | 15.042*** |

Note:

1. The regression model is based on a stepwise multiple regression analysis.

2. Variables included in the analysis include: basic properties (turnover intention, exercise habits, Specialty attributes, employment status), the overall work stress score, and overall job satisfaction scores.

3. * < .05 ** < .01 *** < .001

4. a: turnover intention = 1, no turnover intention = 0; b: exercise habits=1, no exercise habits = 0; c: subspecialty attributes = 1, no subspecialty attributes = 0

4. Discussion

Nurse anesthetists often need to withstand the pressure of changes in a patient's vital signs and, during anesthesia, are required to maintain a high degree of vigilance, leading to great pressure at work. This might also affect overall life satisfaction and quality of life, as well as endangering the quality and safety of patient care.

This study found from the analysis of basic attributes and hospital work stress that when the number of overtime hours was ≥ 40 hours per month, overall work stress was higher. Since excessive overtime would result in a heavy workload, fatigue was generated and thus affected work efficiency and performance, with long-term accumulation giving rise to more physical and mental health problems. This result was consistent with the results from previous studies (23, 24). "Overall satisfaction" and "hospital," "age," "workplace," "overtime hours," "turnover intention," and "years of experience in anesthesia care" all reached statistical significance. Work experience would differ among hospitals and work places, so the overall job satisfaction would be a significantly different. This result was similar to that of a previous study (25). As age and years of experience increase, overall job satisfaction also increases, and those with no turnover intention also had higher satisfaction with the work environment. This result was consistent with previous findings (26-29). Those with less overtime hours and those without turnover intention had higher job satisfaction. When overtime hours increased, turnover intention also increased, and when overtime hours were reduced, work load was decreased and so job satisfaction would then increase. Therefore, as work stress is increased, the job satisfaction of nurses is decreased and generates turnover intention (14-16, 29), and this study showed similar findings.

"SF36 overall quality of life" and "exercise habits," "employment status," "subspecialty attribute," and "turnover intention" were statistically significant. Individuals with exercise habits, employment by contract, subspecialty attributes, and no turnover intention exhibited better overall quality of life, a finding which was similar to the results of a previous study exploring the relationship between the promotion of healthy lifestyles and quality of life for nurses (30). "Turnover intention," "PCS" and "MCS" were all statistically significant, and those nurses with no turnover intention had a better quality of life in the various dimensions than those who had turnover intention. This indicated a significant negative correlation between turnover intention and job satisfaction and that as nursing job satisfaction is increased, the quality of life is increased as well (29). The quality of life in terms of "years of nursing experience" and "MCS" reached statistical significance, which meant that individuals with more years of nursing-related experience had better quality of life than those with less. This result was similar to that of a previous study (30). This study showed that older individuals with a spouse had a higher quality of life in many respects. It was probably because as age, work

experience, and patient care experience increased, job satisfaction improved, thereby enhancing quality of life. Individuals with spouses had more opportunities for emotional adjustment and care from their spouses so as to reduce work stress, resulting in a better quality of life. "Having a subspecialty" and "MCS" were also statistically significant, and those with subspecialty attributes had a better quality of life than those who without them. It was inferred that when performing anesthesia during surgery, specialized personnel could perform different duties, and their familiarity with and professionalism during anesthesia would increase, so that their levels of psychological stress and activation would both be in a better condition.

This study used stepwise multiple regressions to analyze the important factors that affected the overall quality of life of nurse anesthetists in southern medical centers and found that the quality of life scores of individuals with turnover intention decreased by 8.231 points when compared with those without such intention. With each 1 point increase in overall job satisfaction, the quality of life score increased by 0.481 points. The quality of life scores of individuals with exercise habits increased by 5.942 points when compared with those without such habits. The quality of life scores of individuals with subspecialty attributes increased by 5.287 points when compared with those of nurse without them. Among other related studies, one article focusing on the job satisfaction and quality of life of nurses in Yunlin and Chiayi hospitals discovered that health condition, overall work stress, job satisfaction and quality of life were statistically significant and that the greater the age, the better the quality of life (20). Another study focusing on the quality of life of hemodialysis patients indicated that one of the important predictors of overall quality of life was exercise habits (31), and the present study found the same result. Other studies have also pointed out that individuals with no turnover intention had higher job satisfaction and that since the job satisfaction of nurses and quality of life were positively correlated, when job satisfaction was high, it would attract employees with strong capability to continue on and lower employee turnover intentions, thus improving the quality of life (29, 32). The above findings were all similar to the findings of this study.

However, this study did have some research limitations. Firstly, the subjects in this study were all nurse anesthetists from three southern medical centers, so selection bias could not be avoided. Therefore, the results cannot be generalized to all nurse anesthetists in Taiwan, although the results should be of reference value for hospitals with similar characteristics. Secondly, this study was limited to the hospitals measured, and the subjects were nursing staff with more than 6 months of experience. Groups under high pressure might have left or been reassigned to non-anesthetist nursing roles, so the overall results may be skewed accordingly. Thirdly, this study was a cross-sectional study and thus was limited in terms of determining causal relationships.

5. Conclusion

The basic attributes of nurse anesthetists in terms of "overall work stress score" were related to overtime hours and turnover intentions. "Overall job satisfaction" was related to age, place of work, overtime hours, turnover intention and years of nurse anesthetic experience. The quality of life in terms of "PCS" showed that it was related to turnover intention. In terms of "MCS," it was shown that individuals who were older, have a spouse, are employed under contract, have subspecialty attributes, have no turnover intentions, have higher overall years of nursing experience and higher years of hospital anesthesia experience had higher scores. The stepwise multiple regression analysis showed that turnover intention, overall job satisfaction, exercise habits and subspecialty attributes were important factors affecting the overall quality of life.

REFERENCES

- [1] Chen, H.C., Chou, F.H., Chen, M.C., Su, S.F., Wang, S.Y., Feng, W.W et al. (2006). A survey of quality of life and depression for police officers in Kaohsiung, Taiwan. *Quality of Life Research*, 15 (5), 925–932.
- [2] Mckinney, A.A., & Melby, V. (2002). Relocation stress in critical care : a review of the literature. *Journal of Clinical Nursing*, 11(2), 149-157.
- [3] Vanitallie, T.B. (2002). Stress: a risk factor for serious illness. *Metabolism*, 51 (6), 40–45.
- [4] Riding, R.J., & Wheeler, H.H. (1995). Occupational stress and cognitive style in nurses: 2. *British Journal of Nursing*, 4 (3), 160–168.
- [5] Wheeler, H.H. (1997). A review of nurse occupational stress Research:1. *British Journal of Nursing*, 6 (11), 642–645.
- [6] AbuAlRub, R.F. (2004) .Job stress, job performance, and social support among hospital nurses. *Journal of Nursing Scholarship*, 36 (1), 73–78.
- [7] French, S.E., Lenton, R., Walters, V., & Eyles, J. (2000). An empirical evaluation of an expanded nursing stress scale. *Journal of Nursing Measurement*, 8 (2), 161–178.
- [8] Aiken, L.H., Clarke, S.P., Sloane, D.M., Sochalski, J., & Silber, J.H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *Journal of the American Medical Association*, 288 (16), 1987–1993.
- [9] Comber, B., & Barriball, K.L. (2007). Impact of job satisfaction components on intent to leave an turnover for hospital-based nurses: a review of the research literature. *International Journal of Nursing Studies*, 44 (2), 297–314.
- [10] Vahey, D.C., Aiken, L.H., Sloane, D.M., Clarke, S.P., & Vargas, D. (2004). Nurse burnout and patient satisfaction. *Medical Care*, 42 (2), 57-66.
- [11] McNeese-Smith, D.K., & Crook, M. (2003). Nursing values and a changing nurse workforce: values, age, and job stages. *Journal of Nursing Administration*, 33 (5), 260–270.
- [12] AbuAlRub, R.F. & Al-Zaru, I.M. (2008). Job stress, recognition, job performance and intention to stay at work among Jordanian hospital nurses. *Journal of Nursing Management*, 16 (3), 227–236.
- [13] Eva, G., Bernardo, M.J., Youxin, L., & José, L.G. (2008). The relationship between socio-demographic variables, job stressors, burnout, and hardy personality in nurses: an exploratory study. *International Journal of Nursing Studies*, 45 (3), 418-427.
- [14] Lynn, M.R., & Redman, R.W. (2005). Faces of the nursing shortage: influences on staff nurses' intentions to leave their positions or nursing. *Journal of Nursing Administration*, 35 (5), 264-270.
- [15] Patrician P.A., Shang J. & Lake E.T. (2010). Organizational determinants of work outcomes and quality care ratings among Army Medical Department registered nurses. *Research in Nursing and Health*, 33 (2), 99–110.
- [16] Aiken, L.H., Clarke, S.P., Sloane, D.M., Lake, E.T., & Cheney, T. (2008). Effects of hospital care environment on patient mortality and nurse outcomes. *Journal of Nursing Administration*, 38(5), 223–229.
- [17] Lee, I. (2004). Work stress, Coping Strategies, and Consequences among Public Health Nurses-Based on an Interactive Model. *Taiwan Journal of Public Health*, 23(5), 398-405.
- [18] See, L.C., Chang, H.J., Liu, M.J., & Cheng, H.K. (2007). Development and Evaluation of Validity and Reliability of a Questionnaire on Medical Workers' Stress. *Taiwan Journal of Public Health*, 26(6), 452-461.
- [19] Chiu, W.C., Su, S.B., & Huang, C.Y. (2010). Work Stress among Staff at a Medical Center in Southern Taiwan. *Chinese Journal of Occupational Medicine*, 17(2), 93-104.
- [20] Yu, Y.J., Hung, S.W., Wu, Y.K., Tsai, L.C., Wang, H.M., & Lin, C.J. (2008). Job satisfaction and quality of life among hospital nurses in the Yunlin-Chiayi area. *Journal of Nursing*, 55(2), 29-38.
- [21] Lin, C.J., Wang, H.C., Li, T.C., & Huang, L.C. (2007). Reliability and Validity of Nurses' Job Satisfaction Scale and Nurses' Professional Commitment. *Mid-Taiwan Journal of Medicine*, 2(12), 65-75.
- [22] Lu, J.F, Tseng, H.M., & Tsai, Y.J. (2003). Assessment of health-related quality of life in Taiwan (I): Development and psychometric testing of SF-36 Taiwan version. *Taiwan Journal of Public Health*, 22(6). 501-511.
- [23] Chuang, Y.H., Lin, S.Y., Chen, H.Y., & Tsai, P.L. (2008). Work stress and social support among new nurses in a regional teaching hospital in Kaohsiung. *The Kaohsiung Journal of Nursing*, 25(2), 5-19.
- [24] Lin, Y.W., Chang, Y.W., & Tsai, C.C. (2004). Job strain and health-related quality of life of hospital employees: case of a medical center in Tai-Chung. *Taiwan Journal of Public Health*, 47(2), 111-138.
- [25] Tsai, H.C., Huang, L.C., Liu, S.C., Wang, H.C., Li, T.C., & Lin, C.J. (2007). Nurses' Professional Commitment and Job Satisfaction. *Mid-Taiwan Journal of Medicine*, 12(2), 100-108.

- [26] Hwu, L.J., Tseng, S.M., & Yuan, S.C. (2003). Job Satisfaction among Nurses in a Medical Center in Central Taiwan. *The Chung Shan Medical Journal*, 14(2), 315-325.
- [27] Chung, C.H., Chen, H.C., & Huang, S.M. (2004). A Survey of Nurses's Job Satisfaction in Operating Room .*Chang Gung Nursing*, 15(1), 15-21.
- [28] Mrayyan, M.T. (2005). Nurse job satisfaction and retention: comparing public to private hospitals in Jordan. *Journal of Nursing Management*, 13 (1), 40—50.
- [29] Lu, H., While, A.E., & Barriball, K.L. (2007). A model of job satisfaction of nurses: a reflection of nurses' working lives in Mainland China. *Journal of Advanced Nursing*, 58 (5), 468-479.
- [30] Chen, N.W., Chang, T.H., Chang, S.P., & Sung, H.Y. (2011). Nurses' Health Promoting Lifestyle Explore the relationship between type and quality of life. *Cheng Ching Medical Journal*, 7 (2), 27-37.
- [31] Cheng, S.Y. (2009). Factors Impacting Quality of Life in Dialysis Patients. *Cheng Ching Medical Journal*, 5 (2), 31-40.
- [32] Cimete, G., Gencalp, N.S., & Keskin, G. (2003). Quality of life and job satisfaction of nurses. *Journal of Nursing Care Quality*, 18 (2), 151-158.