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Original Article

Survey and coping strategies for job stress of new nurses in pharmacy intravenous admixture service: a pilot study

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Abstract: To survey the nurse stress and analyze stressors in new nurses from pharmacy intravenous admixture service (PIAS). A questionnaire survey referring to the revised stressor scale was carried out on 52 new nurses of PIAS in four hospitals in Harbin. The average stress score for all participants was 2.43±0.63, as medium level of stress. The stressors were classified into 6 categories: ensuring up-to-date knowledge of professional nursing skills, increased workload and work-time, interpersonal relationship, ensuring knowledge of equipments, attending educational programs, and decreased occupational demand. The most important stressors included fear of medical accident occurrence, fear of failure in performance assessment, fear of occupational injuries, feeling fatigue and lack of sleep. Considering the various kinds of stressors in the working places, it was necessary for managers' to use appropriate strategies to cope with the job stress in new nurses of PIAS.

Keywords: Job stress nurse coping strategy, pharmacy intravenous admixture service

Introduction

Stress is a term that is commonly used within the work environment and describes a variety of disturbing and symptomatic experiences. There have been a number of theoretical frameworks which were used to describe the process [1, 2]. Stress is experienced when the demands of the situation exceed the person's resources and certain harm or loss is anticipated. Occupational stress is a recognized problem in health care workers [3]. Nursing has been identified by a number of studies as a stressful occupation. Nurses' stress was first assessed by Menzies who identified four sources of anxiety among nurses: patient care, decision making, taking responsibility, and change [4]. The nurses have long been regarded as stress-filled population based on the physical labor, long work hours, unstable staffing, and complex interpersonal relationships [5]. Since the mid-1980s, nurses' work stress has been escalating due to the increasing use of technology, continuing rises in health care costs, and turbulence within the work environment [6, 7]. It was found that nurses' stress brought hazardous effects not only on nurses' health but also on their abilities to cope with job demands. This seriously impairs the provision of quality care and the efficacy of health services delivery [8-10].

Senior nurses always can cope with stress, while it is difficult for new nurse graduates who just graduated from schools. Graduates always experienced significant adjustments in assimilating into employment. For many new graduates, this transition is "life in a very uncomfortable world" [11]. Within the first year of initial employment, 18 to 50% of new nurse graduates change jobs and some even leave their profession [12-14]. Another international study reported that about 21-24% of nurses from Australia and New Zealand plan to quit their job.

Table 1. General information of participants

Item		New nurse (N=52)	Control nurse (N=95)
Age (years)		21.58±0.92*	31.27±2.89*
Education (n, %)	Technical school	5 (9.6)	6 (6.3)
	College	38 (73.1)	44 (46.3)
	University	9 (17.3)	45 (47.4)
Gender (Male/Female)		13/39	12/83
Single-Child (Yes/No)		47/5*	38/57*
Position Form	Temporary	48	32
	Regular	4*	63*

Note: *indicated the difference between the two groups was significant (P < 0.05).

The transitional period, during which the registered nurse moves from being a new graduate to an independent staff nurse, has been well documented as a time of stress and anxiety [15].

Despite the fact that new graduates are one of the largest sources of nurses entering the profession; work-related stress, e.g., program type, work time, orientation, etc., remain largely under-investigated [16, 17]. Concerted efforts are still necessary to support them during the transition phase. Nevertheless, most correlated studies in nursing workforce on stress and related concepts have focused on job satisfaction and burnout, and relatively little attention has been paid to the newly graduated nurses and how demographic and environmental factors associate with work-related stress [18-20]. The purpose of the current study is to use a descriptive correlation design to examine the effect of work-related stressors and coping strategies on new nurses of pharmacy intravenous admixture service (PIAS) during their first year following graduation.

Methods

Participants

The study was conducted at four Grade A Tertiary hospitals in Harbin, China. All activities were guided by a research protocol and approved by the ethics committee of The Fourth Hospital Affiliated to Harbin Medical University, and all participants gave written informed consent. From July 2011 to November 2011, all new nurses (N=52 cases, working age ≤1 year) were recruited as experimental group (EG) from the PIAS of the four hospitals, and senior nurses (100 cases, working age > 1 year) in the four hospitals as control. The questionnaire was allocated at the morning session. All of the participants were told about the significance of survey, and they carefully read and completed the questionnaire by themselves. In EG, 52 pieces of questionnaire were taken back (recovery rate of 100%), and only 95 pieces were took back in control (recovery rate of 95%).

Measurement strategy

The questionnaire was developed using the information procured from interviews. Results from these interviews were organized with the most frequently identified events or workplace stressors being collected following analysis of interview data. Questions about these events were formulated into a standardized questionnaire.

The Chinese Version of stress scale was revised according to the virtuous features of PIAS [21]. The scale was divided into two parts. The first part was the sociological information (5 items) of respondents, including age, gender, education, single child, post form, and the second part was the stressor scale with 6 dimensions and 32 items. The stressor scale mainly focused on the following 6 dimensions: ensuring up-to-date knowledge of professional nursing skills, increased workload and work-time, interpersonal relationship, ensuring knowledge of equipments, attending educational programs, and decreased occupational demand. The four-score scale was used in this study, 4 scores for high stress, 3 scores for moderate stress, 2 scores for general stress, 1 score for low stress, and 0 for without stress. Mean score less than 2.00 was defined as low stress, between 2.01 and 3.00 as moderate stress, and between 3.01 and 4.00 as high stress. Data were collected by the well-trained and well-qualified two primary investigators themselves. These scales showed adequate internal consistency.

Statistical analysis

The data were expressed as mean ± standard deviation. Differences between the two groups regarding these indexes were analyzed by the

Table 2. The main six dimensions in stress scale

Item	Stress score in new nurses	Stress score in control nurses
Professional nursing skills	3.28±0.79	3.24±0.59
Workload and work-time	3.07±0.90	2.78±0.67
Sociological environment	2.98±0.64	2.90±0.74
Education and demand	2.06±0.78	1.98±0.78
Interpersonal relationship	2.04±0.90	1.95±0.71
Working environment	1.78±0.90	2.78±0.90
Average	2.43±0.63	2.21±0.63

t-test and the correlation between different indexes was analyzed by the Pearson correlation analysis. All tests were two-tailed with a 0.05 level of significance, performed in a complete case analytic set and used the SPSS13.0 software.

Results

From the **Table 1**, new nurses were mainly younger than control nurses, and they received a better high-education than control. However, most of the new nurses (48/52) in PIAS were temporary employees which may due to the limited authorized positions in China. The increased demand of nursing workers not only asked for higher education for new nurses, but also changed the main position forms in hospitals.

The average stress of new nurses was higher than that of control nurses, and the most main stress was from professional nursing skills, as nurses in PIAS should know more pharmacological knowledge (**Tables 2** and **3**). The six dimensional indexes in our stress scale are listed in **Table 2**, and working environment would cause little stress to new nurses, while moderate stress to senior ones. In the specific stress analysis, fear of medical incidence brought a highest stress to new nurses and reformed employment brought a lightest stress to them (**Table 3**).

Discussion

In this survey, the mean stress of EG group was moderate, and the value was slightly higher than that of controls. The four items (fear of medical accident occurrence, fear of failure in performance assessment, fear of occupational injuries, feeling fatigue and lack of sleep), in EG groups were classified to be high stress (score > 3.01). However, the two items in control group (fear of medical accident occurrence, fear of failure in performance assessment), were moderate stress (3.00 > score > 2.01), and the other 2 items as low stress (score < 2.00).

For new nurses from PIAS, fear of medical accident occurrence was the most important stressor, which was closely related with the nature of PIAS work. They needed to configure more than 200 sets of infusion for each patient per day, which was laborious and taxing. Taking our hospital for example, there were more than 2000 types of drugs and some of them were with similar appearance and specifications. The new nurses would be unfamiliar with these drugs and with high incidence of medical accident. Meanwhile, long duration of single-tasking process would cause brain and hand numbness. With the enactment of Treatment Regulations for Medical Accident, legal awareness and right safeguarding awareness of patients have been more and more strong, which resulted in the fear of medical accident occurrence and involved in medical disputes for new nurses. Moreover, the managers increased the error penalty in order to strengthen their high attention to new staffs. Excessive emphasis on the severity of the consequences of accidents caused the new nurses to give a high score in this item.

For new nurses, fear of failure in performance assessment was the second main stressor during the survey. Since 2010, all Grade A Tertiary hospitals in Harbin have conducted a performance review in succession. The assessment method for PIAS was the amount of configuration dosage per unit time. The workload was related with bonuses, briefly, more money with more work. New nurses always obtained much lower income than senior nurses, which brought a big income gap between the two groups. Some new nurses could not complete the basic task and would lose opportunity of being endowed with the title of "Yearly Excellent Nurse". Therefore, new nurses would be fear of failure in this item.

For new nurses, fear of occupational injuries was the third main stressor. Nurses have to contact with a large quantity of glass ampoules, and need to hand off the bottle neck. Finger-

Table 3. The specific stressor in this study

Item	Stress score in new nurses	Stress score in control nurses
Fear of medical accident	3.92±0.65	3.60±0.65
Fear of failure in performance assessment	3.90±0.97	3.10±0.90
Fear of occupational injuries	3.28±0.96	2.90±0.97
Feeling fatigue and lack of sleep	3.13±0.90	2.78±0.96
Lack of pharmacological knowledge	2.78±0.95	2.60±0.89
Work strain	2.75±0.89	2.52±0.90
Frequent exams	2.54±0.72	2.32±0.72
Without vacation	2.24±0.88	2.20±0.95
Unsatisfied salary and welfare	2.22±0.90	2.12±0.88
Reformed employment	2.18±0.65	1.32±0.65

cutting injuries always occurred, which tended to cause physical and mental injuries to them. According to a rough statistics in our centre, there were 200~260 cases of hand injuries every year, among which 70% occurred in new nurses. The main reason may be that they were unfamiliar with glass ampoules open.

The stress from high workload and long work-time for new nurses is significantly more severe than that for senior nurses. They were not satisfied with long work-time, high workload, early morning session, lack of sleep, fatigue and without weekend. In PIAS, the working time is from 6-7 am, which purse them to adjust dinner time. This disturbed their biological clock in school. The hold time is always longer than 4 hours and the preparation action is in fixed position, which would cause discomfort in cervical vertebra, lumbar and hand. Most of the new nurses are single child in their family, and they are spoilt since young. They cannot tolerate such high-intensity workload.

The knowledge of professional pharmacological skills was the fifth main stressor. Different from ordinary nurses in other departments, nurses from PIAS should be knowledge of pharmacological skills and they did not learn enough in school. PIAS is a new department in China, and most of nursing high schools have not set up related discipline. The nurses should learn the knowledge after graduation, which is difficult to them. Therefore, a new nursing training program in every PIAS in Harbin was developed. After one-year training, lots of exams were set to test the effect.

The position form was the sixth main stressor. In China, new nurses are always enrolled as temporary employees, which would cause instability to their occupation security. However, senior nurses are always enrolled as regular employees with a higher salary and welfare than new nurses. The discrepancy resulted in uncomfortable feeling in them and new nurses were fear of losing their jobs in case of making mistakes.

Other stressors included lack of respect from colleagues and hospital managers, unfriendly interpersonal relationship, poor working environment and lack of instruments. In this study, there were 82.7% of new nurses receiving higher education (College/University), who were with good professional skills, communication skills, and team work spirit. The survey suggested that the environment and facilities were satisfactory.

Coping strategies

Strengthen training of professional skills: The managers should often organize new nurses to participant in training programs in order to accumulate enough pharmaceutical knowledge, reduce unnecessary mistakes and improve their ability in identifying wrong prescription. They also should teach new nurses to treat the mistakes and failure in the work, tolerate the mistakes as much as possible, and coordinate to reduce the drug loss.

Building good environment to help new nurses keep psychologically healthy: The managers and teachers should provide more operation opportunity to new nursse and extend the training time as long as possible. This could help them to master the configuration and improve their work efficiency. Managers should consider progress of new nurses as reaching the standard, and encourage them as much as possible in order to enhance their confidence. These could help them to keep relaxed and comfortable in the following work-time.

Flexible scheduling to reduce labor intensity: Besides ordinary configuration, managers can arrange some auxiliary work to them, including wrapper, storage, and pharmacy sorting. This could reduce labor intensity and help them to

know well with the work. Before new nurses master the correct configuration method, the department should provide protective equipments for their operation, such as protective gloves, bottle opener and so on, in order to reduce the occupational injuries.

Respect and take care of new nurses: Nursing managers should communicate with new nurses as much as possible to help them solve practical difficulties. It is suggested that doing suitable activities is good to improve physical and mental health and cure bad stressor. Full consideration to their legitimate rights and equal interests should be given to the new nurses, and the salary gap between new nurses and senior ones should be narrowed, which could improve their working enthusiasm. Moreover, appropriate vacation and promotion opportunity should be enacted for new nurses to improve their working satisfaction.

Improve their adaption ability: Managers should pay attention to the education quality of new nurses, carry out proper psychological counseling, guide their correct attitude of the society for understanding the nature of work, cultivate their independent strong personality and the spirit of bear hardships and stand hard work. Regular nurse education and psychological classes should be organized to guide new nurses learning stress coping skills.

Conclusion

Nursing work of high intensity would make new nurses feeling fatigue and affect the nursing quality. PIAS is still a new department in China, and managers should pay more and more attentions to improve training programs and guide new nurse to master the professional skills. New nurses are often feeling stress in their work, so nursing managers must know how to create sound working environment and take proper measures to alleviate the pressure on new nurses. Only by keeping mental and physical healthy, nursing workers could perform well in their work.

Disclosure of conflict of interest

None.

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