

Satisfaction with the 2-year Nurse Postgraduate Training Program as a Predictor of Retention in New Nurses: A Longitudinal Study

*Shu-Hwa Chen¹, Chun-Chin Tsai², Chia-Shan Wu³,
Mei-Fang Chen⁴ & Mei-Hui Chen⁵*

Purpose: This study was to investigate whether satisfaction with the 2-year nurse postgraduate training program for nurses predicts their retention. Shortages of nursing personnel have been reported in many countries. Satisfaction and retention rate are the best indicators of the efficacy of a retention program. **Methods:** A convenience sample of 190 new nurses was recruited from a single hospital in Kaohsiung, Taiwan in the years 2018 and 2019. Data for satisfaction of the new nurses were collected by questionnaire. Retention outcome data were collected 1 year after the questionnaire surveys. **Results:** New nurses were highly satisfied with the 2-year nurse postgraduate training program. The aspects of the program that had the highest and lowest satisfaction were preceptor and work atmosphere, respectively. Multiple logistic regression analysis showed that the predictors of retention in the new nurses were the phase of the learning process, resources and feedback channels, and work atmosphere. **Conclusions:** Hospital managers can use the results of this study to improve the effectiveness of nursing curricula and to improve retention of new nurses. The results of this study have important implications for the professional development, satisfaction and retention of new nurses.

Key words: predictor, program evaluation, continuing education, retention, new nurses

(J Med Education 2021; 25: 35~48)

DOI: 10.6145/jme.202103_25(1).0005

¹ Cancer Center , Kaohsiung Chang Gung Memorial Hospital; School of Nursing, Fooyin University, Taiwan; ² Department of Refrigeration, Air-Conditioning and Energy Engineering, Far East University, Tainan, Taiwan; ³ Department of Nursing, National Tainan Junior College of Nursing; ⁴ Department of Nursing, National Tainan Junior College of Nursing, Taiwan; ⁵ Department of Nursing, Kaohsiung Chang Gung Memorial Hospital; School of Nursing, Tzu Hui Institute of Technology, Taiwan

Received: 6 January 2021; Accepted: 26 March 2021

Correspondence to: Mei-Fang Chen, Department of Nursing, National Tainan Junior College of Nursing, Taiwan, 78, Sec. 2, Minzu Rd., Tainan City 700, Taiwan, R.O.C.

E-mail: 38914003@yahoo.com.tw; meifang0302@gmail.com

INTRODUCTION

Severe shortages of nursing personnel have been reported in many countries.^[1] High turnover rates have been reported in the United States (26.6 per cent), Canada (19.9 per cent) and Australia (15.1 per cent).^[1] A similar phenomenon has been reported from Taiwan Union of Nurses Association in Taiwan, where the turnover rate for nurses is 16.45-19.03% for 2009-2013.^[2] These high turnover rates not only have detrimental financial effects on healthcare systems, they also have negative effects on the continuity and quality of healthcare services.^[3] Therefore, improving turnover is essential.

In 2017, the Taiwan Ministry of Health and Welfare implemented the 2-year nurse postgraduate training program (N-PGY2 program) that provides financial support for training new nurses. The main objectives of the program are to prepare new nurses for professional practice and to improve retention.^[4] This N-PGY2 program is designed to encourage teaching hospitals to provide training venues and teaching resources so that new nurses can receive the training they need to improve the quality of medical care. Past studies in the United States have explored the effects of nurse retention programs.^[5,6] However, few studies have evaluated how satisfaction with a training program for new nurses affects retention of new nurses in Taiwan. Since the effect and content of a training program for new nurses may differ across populations,^[6] training programs for new nurses must be compared among different populations. Therefore, the purpose of this study was to evaluate the N-PGY2 program for new nurses in Taiwan in terms of satisfaction and retention.

A role change from student nurse to practicing nurse is stressful and challenging

for new nurses because they must often take responsibility for multiple patients who may have complex health conditions.^[3] Eckerson reported that the main causes of low retention in new nurses were high work-related stress and difficulty acquiring a day shift position.^[6] In contrast, another study concluded that the main causes were professionalism, poor communication skills, and low job satisfaction.^[3,7] By improving retention, a program for improving satisfaction in new nurses can substantially reduce the personnel costs of a healthcare facility.^[7] Developing a comprehensive and effective retention program requires thorough evaluation of its processes and outcomes.^[3] The processes of a retention program should support the professional development of new nurses. The essential components of the retention program are system orientation, didactic classes, hands on experience, promotion of interprofessional care and a dedicated preceptor.^[5,7] A friendly work environment and efficient resource and feedback channels also support new graduates in the transition from student to practicing nurse.^[5] In term of outcomes, a retention program should increase competency, confidence, satisfaction, and retention.^[3] Work satisfaction and retention rate are the best indicators of the efficacy of a retention program.^[3,8]

To help new nurses transition to professional practice,^[4] a N-PGY2 program was developed and practiced based on the clinical experience of nurses and the literature.^[4,5] The three phases of this N-PGY2 program are location-based curriculum training (3 months), core curriculum training (9 months), and professional courses (12 months). The content of the program are professional skills, humanities, self-growth, and practical operation. Nurses need to be assessed whether they pass each phase (see table 1). Notably, the program includes a clinical nurse preceptor system in which full-time,

Table 1. Course schedule for a two-year nurse post graduate training program.

Training courses	Location-based curriculum (less than 3 months work experience)		Core curriculum (3-12 months work experience)	Professional course (1-2 years work experience)
	On-the-job training course	New personnel training course		
Training time	1 week	7 weeks	9 months	12 months
Objectives	1. Understand the practice environment and institutional norms. 2. Acquire knowledge and skills needed to maintain the health of patients.	1. Acquire professional knowledge and skills needed to care for patients. 2. Take responsibility for care of patients.	1. Acquire ability and qualifications to provide clinical care for general patients. 2. Comply with legal regulations related to care of patients. 3. Understand the cross-disciplinary care concept and the shared care model.	1. Acquire professional skill in caring for critically ill patients. 2. Same as Core course 2. 3. Join cross-disciplinary care team.
Content	1. Hospital Profile: Introduction to the history, purpose, vision, organization and environment. 2. Introduction to the Department of Nursing: purpose, philosophy, administration, quality control, education and capacity advancement system. 3. Job description for nursing staff: personnel operations, employee benefits, fire safety, hospital information (including nursing information), etc. 4. Introduction to nursing work: (1) Patient care mode (2) Nursing record and common forms			
	1. Professional skills (1) Common diseases, examinations and treatments in the work unit (2) Commonly used drugs, side effects, medication safety (3) Common nursing skills (4) Common clinical health problems (5) Discharge preparation service, case referral process, case management care, etc. (6) Physical assessment skills, nursing information system operations (7) Ward routine: hospitalization, recordkeeping, consultation, discharge, transfer, etc. (8) Common medical machines			
	Same as new personnel training course (1)-(4) (5) Analysis and treatment of case health problems; application of the nursing process. (6) Quality Management (II): Introduction to quality management activities, e.g., care quality concept, standard setting and monitoring, and evaluation of new hospitals (7) Infection control training (8) Patient rights: consent and DNR orders (9) Patient safety promotion and case analysis (10) Suicide prevention and treatment			
	(1) Nursing assessment: ECG, abnormal test value, ABG examination and interpretation, or chronic pain assessment. (2) Specialist nursing techniques (as determined by unit characteristics) (3) Care for patients with severe or difficult conditions (4) Quality Management (III): Participate in development of nursing standards, monitoring and continuous quality improvement measures (5) Infection control training (6) Organ donation process (7) Cross-disciplinary team joint care training			

(To be continued)

(continued from the previous page)

Training courses	Location-based curriculum (less than 3 months work experience)		Professional course (1-2 years work experience)
	On-the-job training course	New personnel training course	
	(3) Quality management: notification of adverse events, prevention of needle incidents (employee safety)	(9) Patient safety care courses and clinical practice	Core curriculum (3-12 months work experience) (11) Understanding of cross-disciplinary care team (e.g., case manager, specialist nurse, nutritionist, rehabilitation therapist and other medical personnel roles and tasks)
	(4) Infection control: isolation measures and protection standards		
	(5) Patient safety: patient identification, medication safety, blood transfusion safety, prevention of falls, and handover safety		
	(6) Cardiopulmonary resuscitation (CPCR) techniques	2. Humanities	
	(7) Common inspection procedures: safe collection of specimens (e.g., blood, urine, stool) and precautions	(1) Newcomer role, stress management and adjustment (2) Effective communication: medical communication (including medical terms and abbreviations), care communication (3) Employee rights: labor law, gender equality, preventing sexual harassment	(1) Nursing ethics and legal issues: case discussion (2) Communication skills: listening, negotiation, skills and teamwork (3) Coping with stress and practical applications (4) Understanding healthcare policies
		3. Self-growth	
		Pass OSCE examinations	(1) Teaching groups of patients (2) Writing case reports
		4. Practical operation	
		(1) First month: Care for 6 to 8 patients with nursing preceptor	Care for 8 to 11 patients under supervision of nursing preceptor (adjusted according to the severity of patient conditions)
		(2) Second month: Independently care for 4 to	

(To be continued)

(continued from the previous page)			
Training courses	Location-based curriculum (less than 3 months work experience)		Professional course (1-2 years work experience)
	On-the-job training course	New personnel training course	Core curriculum (3-12 months work experience)
Assessment of nursing trainees	The written test should reach more than 60 points	6 patients under guidance of nursing preceptor (3) Third month: Independently care for 6 to 8 patients under the guidance of nursing preceptor	
		1. Knowledge: Training written test scores must reach more than 60 points. 2. Attitude: (1) three-month training attendance rate is 100%, (2) Complete bedside teaching cases. 3. Skills: (1) Pass the Mini-CEX scale assessment (administration nursing assessment and admission nursing assessment), (2) pass the clinical skills test (hand washing, defibrillator use, patient identification, drug administration, handling doctor's orders, blood transfusion, blood preparation, specimen collection, intravenous injection) reached 100%. (3) The necessary items of the guidance manual reach 100%, and the remaining items need to reach more than 85%. 4. Overall assessment: (1) Training assessment scores must reach more than 75 points. (2) Pass the bedside teaching case.	1. Knowledge: training written test score must reach more than 60 points. 2. Attitude: (1) twelve-month training attendance rate is 100%, (2) Participation in interprofessional education conferences 3 times per year. 3. Overall assessment: (1) Training assessment scores must reach more than 75 points, and (2) the completion of interprofessional education conferences report.

fixed-care preceptor provide new nurse with one-on-one assistance and guidance. The purpose of the program is to assist new nurses in developing the clinical work attitudes, knowledge, skills, and professional ethics needed to deliver effective “patient-centered care” and “whole-person care”. Evaluating the satisfaction and retention of new nurses who have participated the N-PGY2 program can provide useful evidences of its efficacy and useful guidelines for further improvement of the program.

METHODS

Data collection for this longitudinal study was performed in years 2018 and 2019 and included personal and hospital-related characteristics of the participants and the results for a questionnaire survey of their satisfaction with the training program. A questionnaire survey was also performed to collect retention data after 1 year.

Sample and setting

A convenience sample of 190 new nurses was recruited from a medical center in Kaohsiung, Taiwan. The inclusion criteria were clear mental status, ability to communicate, and current enrolment in a N-PGY2 program. No nurses were excluded.

Data collection

Data collection was using two questionnaires. The first part was personal and hospital-related characteristics of the participants, included age, gender, education level, hospital unit type, phase of learning process, and whether the currently assigned unit was the personal preference. Data for retention were also collected at 1 year after the survey.

The second part was a satisfaction questionnaire.

After an extensive review of the literature and clinical experiences,^[8] the research team developed a 29-item satisfaction questionnaire (11 items from literature and 18 items from clinical experiences). This 29-item scale included five subscales: perception (three items), resources and feedback channels (five items), training courses (seven items), preceptor (seven items), and work atmosphere (seven items). The instrument requires respondents to rate their agreement with each item on a 5-point Likert scale from 1 (strong disagreement) to 5 (strong agreement). The range of total scores was 29-145 with higher scores indicating higher satisfaction. Eleven experts in related fields, including two physicians, two social workers, three nursing professors, and four head nurses, were invited to evaluate the validity of the questionnaire and to improve the clarity, importance, and appropriateness of the items. Finally, the face validity of the Chinese version was assessed by 10 respondents with characteristics similar to those in the proposed sample. In this study, the content validity index was 0.97, and Cronbach's alpha was .86.

Data analyses

Data were analyzed using SPSS/PC software Version 17.0. Descriptive statistics were used to describe the overall population. All p-values were two tailed, and a priori significance levels were set to $p < .05$. All variables were entered in a logistic regression model. Determinants that had a p-value $< .05$ in multiple logistic regression analysis were used to construct the polytomous logistic regression model.

Ethical considerations

This study was approved by the Human Experiment and Ethics Committee. The researcher contacted new nurses enrolled in the training

program at the hospital and comprehensively explained the study, including its purpose, its procedure, and its relevant risks and benefits. After giving informed consent to the study, each participant took 10-15 minutes to complete the questionnaire. To make participants felt at ease to answer, the questionnaire code with a number rather than participants' name and the information is not provided to participants' supervisor. The research assistant contacted the participants by telephone 1 year after the survey to determine their retention status.

RESULTS

Descriptive data, including personal and hospital-related characteristics of the participants

All 190 of the participants in this study completed the questionnaires, which was a 100% response rate. The mean age was 23.4 year olds (SD = 1.23; range = 21-30). The majority of participants had the following characteristics: female gender (93.2%), university education (96.3%), assignment to surgical unit (31.6%), phase 3 learning process (54.7%), current assignment to hospital unit that was personal preference (76.3%), and retention at 1 year after the survey (90.6%) (Table 2).

Survey results for satisfaction with training program for new nurses

The average score for the total satisfaction scale was 126.72 (SD = 10.35), which indicated that the new nurses were satisfied with the N-PGY2 program. The highest subscale score was for "preceptor", and the lowest subscale score was for "work atmosphere". The highest satisfaction item score was "The preceptor gives timely assistance when I am having trouble learning." and the lowest satisfaction item score was "I am satisfied with my

workload" (Table 3).

Predictors of retention in new nurses

Table 4 shows that the retention and non-retention groups significantly differed in terms of training courses, preceptor and work atmosphere. Significant predictors of retention outcome were phase of the learning process, resources and feedback channels, and work atmosphere. Retention was lower in the second phase of the learning process than in the third phase (AOR = 0.21). Resources and feedback channels and work atmosphere had significant positive associations with retention ratio (AOR:1.61; 3.76; $P < .05$).

DISCUSSION

Nurses who had participated in the N -PGY2 program had a 90.6% retention rate. Previous new nurses at the same institution who had not participated the N-PGY2 program had a 1-year retention rate of 73.7%%. Compared to pre-training, the retention rate was increased by 16.9%. The results of this study were consistent with previous reports that training programs for recent nursing school graduates are associated with increased retention rates.^[5,9] Therefore, training programs can increase the retention rate of new nurses in both eastern and western populations. However, the duration of the training program investigated in this study was 2 years whereas previous studies in the United States have investigated the effects of 1-year programs.^[5] New nurses in Taiwan require at least 2 years of training before they are qualified to provide independent care for critically ill patients.^[4] A residency program should be at least 10-15 months in duration to prepare new nurses for independent practice in general patients.^[5,7] In practice, the duration of a training program is determined by the

Table 2. Summary of personal characteristics and hospital-related factors (N = 190).

Variables	n (%)	(Mean ± SD)
Age (yrs)		23.4 ± 1.23
21-24	168 (88.4)	
25-30	22 (11.6)	
Gender		
Male	13 (6.8)	
Female	177 (93.2)	
Education level		
Junior college	7 (3.7)	
University	183 (96.3)	
Unit type		
Medical	53 (27.9)	
Surgical	60 (31.6)	
Maternity	8 (4.2)	
Pediatric	8 (4.2)	
Psychiatric	12 (6.3)	
Emergency care	6 (3.2)	
Operative care	8 (4.2)	
Intensive care	35 (18.4)	
Phase of learning process		
Phase 1 (less than 3 months work experience)	23 (12.1)	
Phase 2 (3-12 months work experience)	63 (33.2)	
Phase 3 (1-2 years work experience)	104 (54.7)	
Currently assigned unit is personal preference		
Yes	145 (76.3)	
No	45 (23.7)	
Retention after one year		
Yes	172 (90.6)	
No	18 (9.4)	

budget available for training. Ideally, the duration of a program would be determined by the time needed to achieve its objectives.

The average scores for the total scale indicated that new nurses were highly satisfied with the N-PGY2 program which is consistent with a previous report that the overall satisfaction

of new nurses in a retention program was 70.5%.

^[8] Notably, satisfaction was highest for the “preceptor” subscale, and the item with the highest satisfaction was, “The preceptor provides timely assistance when I am having trouble learning.” These results are consistent with reports that high level of satisfaction were the preceptor.^[5,8] The

Table 3. Satisfaction of new nurses with 2-year post graduate training program.

	n (%)					Mean ± SD
	Strongly Disagree n (%)	Disagree n (%)	No opinion n (%)	Agree n (%)	Strongly agree n (%)	
Perception						
1. I understand the purpose of the training program.	0	0	18 (9.5)	103 (54.2)	69 (36.3)	4.27 ± 0.62
2. I understand the content of the training program.	0	0	12 (6.3)	106 (55.8)	72 (37.9)	4.32 ± 0.58
3. I can master the content in each training period of the course.	0	0	12 (6.3)	107 (56.3)	71 (37.4)	4.31 ± 0.58
Mean subscale score (SD)						12.89 ± 0.60
Resources and feedback Channels						
1. The hospital provides sufficient space and equipment for teaching and training.	0	0	4 (2.1)	81 (42.6)	105 (55.3)	4.53 ± 0.54
2. The hospital provides sufficient channels for me to reflect my relevant rights and interests.	0	2 (1.1)	21 (11.1)	87 (45.8)	80 (42.1)	4.29 ± 0.70
3. When I encounter problem or difficulty, I satisfied resolution or rewarded.	0	3 (1.5)	8 (4.2)	89 (46.8)	90 (47.4)	4.33 ± 0.60
4. I am satisfied with the resources available for training courses.	0	0	10 (5.3)	92 (48.4)	88 (46.3)	4.41 ± 0.59
5. I am satisfied with my training hospital.	0	0	21 (11.1)	98 (51.6)	71 (37.4)	4.26 ± 0.64
Mean subscale score (SD)						21.03 ± 2.61
Training courses						
1. The content of the training courses so far is appropriate for my skill level.	0	0	12 (6.3)	99 (52.1)	79 (41.6)	4.35 ± 0.59
2. When I am unable to complete the training course as scheduled, the course has mechanisms for review and remediation.	0	0	6 (3.2)	89 (46.8)	95 (50.0)	4.47 ± 0.56
3. Recording the learning record allows me to monitor training progress.	0	1 (0.5)	11 (5.8)	89 (46.8)	89 (46.8)	4.40 ± 0.62
4. Recording the learning record can help me reflect.	0	1 (0.5)	15 (7.9)	87 (45.8)	87 (45.8)	4.37 ± 0.65

(To be continued)

(continued from the previous page)

	n (%)					Mean $\pm$ SD
	Strongly Disagree n (%)	Disagree n (%)	No opinion n (%)	Agree n (%)	Strongly agree n (%)	
5. The training course increases my ability to achieve whole person care by integrating essential aspects of professional healthcare.	0	1 (0.5)	5 (2.6)	81 (42.6)	103 (54.2)	4.51 $\pm$ 0.58
6. The training courses effectively link school education and clinical work.	0	0	13 (6.8)	80 (42.1)	97 (51.1)	4.44 $\pm$ 0.62
7. The training courses improve the clinical skills of new nurses.	0	0	12 (6.3)	100 (52.6)	78 (41.1)	4.35 $\pm$ 0.59
Mean subscale score (SD)						30.95 $\pm$ 3.56
Preceptor						
1. The preceptor arranges training courses according to my pre-school test results.	0	0	11 (5.8)	86 (45.3)	93 (48.9)	4.43 $\pm$ 0.60
2. The preceptor encourages me to participate in cross-disciplinary teamwork care and give post-meeting guidance or discussion.	0	0	7 (3.7)	83 (43.7)	100 (52.6)	4.49 $\pm$ 0.57
3. The preceptor provides guidance in completing my study report or related care record.	0	0	3 (1.6)	82 (43.2)	105 (55.3)	4.54 $\pm$ 0.53
4. The preceptor gives timely assistance when I am having trouble learning.	0	0	3 (1.6)	67 (35.3)	120 (63.2)	4.62 $\pm$ 0.51
5. The preceptor gives me feedback on my test results.	0	0	7 (3.7)	85 (44.7)	98 (51.6)	4.48 $\pm$ 0.57
6. The preceptor has adequate teaching skills.	0	0	4 (2.1)	74 (38.9)	112 (58.9)	4.57 $\pm$ 0.53
7. I interact well with the preceptor.	0	3 (1.6)	11 (5.8)	65 (34.2)	111 (58.4)	4.49 $\pm$ 0.68
Mean subscale score (SD)						31.62 $\pm$ 3.45
Work atmosphere						
1. I have opportunities to work independently or with limited supervision.	0	0	21 (11.1)	92 (48.4)	77 (40.5)	4.29 $\pm$ 0.66
2. The hospital environment gives me a sense of accomplishment from my work.	0	0	29 (15.3)	93 (48.9)	68 (35.8)	4.21 $\pm$ 0.69

(To be continued)

(continued from the previous page)

	n (%)					Mean $\pm$ SD
	Strongly Disagree n (%)	Disagree n (%)	No opinion n (%)	Agree n (%)	Strongly agree n (%)	
3. When I am doing well, I am satisfied with affirmation or reward	0	1 (0.5)	21 (11.1)	103 (54.2)	65 (34.2)	4.22 $\pm$ 0.65
4. I am satisfied with the way the supervisor treats me.	0	0	19 (10.0)	91 (47.9)	80 (42.1)	4.32 $\pm$ 0.65
5. I am satisfied with getting along the colleagues in the department.	0	3 (1.6)	28 (14.7)	80 (42.1)	79 (41.6)	4.24 $\pm$ 0.76
6. I am satisfied with the current working atmosphere.	0	5 (2.6)	26 (13.7)	99 (52.1)	60 (31.6)	4.13 $\pm$ 0.74
7. I am satisfied with my workload.	0	10 (5.3)	44 (23.2)	76 (40.0)	60 (31.6)	3.93 $\pm$ 0.85
Mean subscale score (SD)						29.348 $\pm$ 4.20
Mean total scale score (SD)						126.72 $\pm$ 10.35

authors of the current study previously reported that satisfaction with the preceptor is the best predictor of self-perceived nursing competence–adequacy.^[10] In the current study, the certified preceptor nurses had more than 5 years of clinical work experience. The preceptor certification required at least two months of courses and clinical training, a passing score on the preceptor examination, and practical one-on-one experience as a preceptor for a new nurse. Therefore, the highest subscale score was for the “satisfaction with the preceptor” subscale. However, unlike other studies (e.g., Cochran, 2017),^[5] the lowest subscale score in this study was for the “satisfaction with the work atmosphere” subscale, and the item with the lowest score in this subscale was, “I am satisfied with my workload”. A possible explanation is the high nurse-patient ratio in Taiwan (e.g., average ratio of 1:9 for daily care in medical center) relative to other countries (e.g., average ratio of 1:6 for daily care in medical center in the United States.^[11] As the ratio increases, the nursing workload increases,

which decreases care quality.^[12] Increasing the number of nursing staff at a medical facility can reportedly enhance nurse retention.^[13] A recent survey of new nurses reported that the main causes of dissatisfaction were burdensome paperwork and limited time to complete their rounds, which were inconsistent with the expectations of new nurses.^[2] Setting realistic nurse/patient ratios can increase satisfaction and further retention. Future studies can compare how different nurse/patient ratios affect retention of new nurses

Predictors of retention in new nurses include the phase of the learning process, resource and feedback channels, and working atmosphere. Retention was lower in participants who were in the second phase of the learning process compared to those who were in the third phase. That is, retention was lower in new nurses with only 3-12 months work experience compared to those with 1-2 years work experience. These results correspond with a previous report that satisfaction of new nurses was decreased at 6 months

Table 4. Predictors of retention in new nurses.

Determinants		retention		Crude OR	Adjusted OR (95% CI)	p Value
Total	None N = 18	Yes N = 172				
Age	23.28	23.42	1.11	0.89 (0.46-1.74)	.740	
Sex						
Male	3	10	3.24	0.39 (0.05-2.93)	.362	
Female	15	162	1	1		
Education level						
Junior college	2	7	0.34	0.314 (0.01-1.80)	.302	
University	16	165	1	1		
Unit type						
Medical/Surgical	8	105	1.83	2.61 (0.54-12.66)	.233	
Pediatric/ Maternity	3	13	0.61	0.48 (0.05-4.20)	.503	
Psychiatric	1	11	1.54	1.39 (0.09-22.68)	.818	
Emergency/ Intensive care or Operative care	6	43	1	1		
The stage of learning process						
Phase 1	3	20	0.34	0.16 (0.02-1.16)	.070	
Phase 2	10	53	0.27	0.21 (0.05-0.97)	.045*	
Phase 3	5	99	1	1		
Currently assigned to preferred unit						
Yes	12	133	0.59	0.59 (0.10-3.64)	.571	
No	6	39	1	1		
Evaluation of a training program						
Perception	12.39	12.95	1.24	1.17 (0.60-2.32)	.643	
Resources and feedback Channel	20.78	22.05	1.20	1.61 (1.05-2.46)	.030*	
Training courses	28.94	31.16	1.19*	1.15 (0.85-1.55)	.363	
Preceptor	30.06	31.78	1.15*	0.96 (0.65-1.14)	.298	
Work atmosphere	21.89	30.12	2.49**	3.76 (1.79-7.61)	<.001**	

Note: *p < .05 ** p < .01.

compared to baseline but had returned to baseline at 12 months.^[14] Low satisfaction resulted in low retention. Another possible explanation is that, compared to participants in the third phase of the learning process, participants in the second phase began to be responsible for a greater number of patients and to work independently. They also began to work night shift and had administrative

responsibilities. All of these factors contributed to decreased retention. Notably, retention was positively associated with perceived resources and feedback channels, which is consistent with previous reports that effective residency programs have resources that meet the needs of new nurses and have effective conflict resolution procedures.^[5,15] Moreover, the score for working atmosphere

was positively associated with retention, which corresponds with a recent report that a good work atmosphere increases retention and satisfaction.^[5] A good work atmosphere is characterized by freedom and independence, positive reinforcement, teamwork, understanding and compassion, and effective communication.^[16] The components of the new nurse program investigated in this study included professional skills, humanities, self-growth, and practical operation. It did not emphasize cohesion of the unit and relationships with supervisors and colleagues. Therefore, a program for new nurses should include training (e.g., role play) in effective interaction among unit staff.

LIMITATIONS

Four limitations of this study were noted. First, the participants were recruited from a single hospital in southern Taiwan, which limited the generalizability of the results of the study. Further studies are needed to evaluate larger populations recruited from other areas of Taiwan or from other countries. Second, this study only performed a quantitative analysis of a training program whereas both qualitative and quantitative data are needed to build a comprehensive training program. Future studies can use a triangulation research method to collect additional data. Third, this study only collected data for satisfaction and retention at one timepoint. Future studies can collect data over a longer period to explore trends in satisfaction and retention of nurses and associated factors. Fourth, a satisfaction questionnaire was newly developed, this scale need more method (such as: factor analysis) and more research to test for increasing its validity and reliability.

CONCLUSIONS

Since nurses who had participated the 2-year nurse postgraduate training program had high retention and high satisfaction, the program is beneficial for new nurses. Satisfaction, including resources and feedback, working atmosphere, and phase of learning process, were predictors of retention. Therefore, to increase retention in new nurses, evaluation of their satisfaction is essential. If the causes of low satisfaction in new nurses are identified, changes can be made to prevent them from leaving. New nurses who are in the second phase of the learning process need additional support. The results of this study have important implications for the professional development, satisfaction and retention of new nurses.

ACKNOWLEDGMENTS

The authors thank the Kaohsiung Chang Gung Memorial Hospital(CDRPG8H0051) and National Tainan Junior College of Nursing for financial support of this study.

REFERENCES

1. New Zealand Nurses Organisation: New Zealand has high nurse turnover rates. Kai Tiaki Nursing New Zealand 2018; 24(7): 6-6.
2. Taiwan Union of Nurses Association (TUNA): Nursing manpower flow survey project, 2015. (Ministry of Science and Technology Report, No: MOHW103-NAHC-M-114-000006). Taipei: National Central Library.
3. Van Camp J, Chappy S: The effectiveness of nurse residency programs on retention: A systematic review. AORN J 2017; 106 (2): 128-43. DOI: 10.1016/j.aorn.2017.06.003

4. The Ministry of Health and Welfare: Guidelines for the two-year registered nurse training course. Retrieved from: <https://dep.mohw.gov.tw/DOMA/cp-2713-41722-106.html>. Accessed 2018.
5. Cochran C: Effectiveness and best practice of nurse residency programs: A literature review. *Medsurg Nurs* 2017; 26(1): 53-63.
6. Eckerson CM: The impact of nurse residency programs in the United States on improving retention and satisfaction of new nurse hires: An evidence-based literature review. *Nurse Educ Today* 2018; 71: 84-90. DOI: 10.1016/j.nedt.2018.09.003
7. Maryniak K, Markantes T, Murphy C: Enhancing the new nurse experience: Creation of a new employee training unit. *Nurs Econ* 2017; 35(6): 322-6.
8. Chang HC, Hung CL, Kao YL, *et al.*: Evaluation of a teaching expense in teaching hospitals program: From viewpoints of new nurse staff. *Yuan-Yuan Nursing* 2017; 11(2): 30-40. DOI: 10.6530/YYN/2017.1.4.
9. AL-Dossary R, Kitsantas P, Maddox PJ: The impact of residency programs on new nurse graduates' clinical decision-making and leadership skills: A systematic review. *Nurse Educ Today* 2014; 34(6): 1024-8. DOI: 10.1016/j.nedt.2013.10.006
10. Chen SW, Chen MF, Kuo ML, *et al.*: Predictor of self- perceived nursing competency among new nurses in Taiwan. *The Journal of Continuing Education in Nursing* 2017; 48(3): 129-37. DOI: 10.3928/00220124-20170220-09
11. Ministry of Health and Welfare: Medical institution setting standards. Retrieved from: <https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=L0020025>. Accessed 1 February 2019.
12. Qureshi SM, Purdy N, Mohani A, *et al.*: Predicting the effect of nurse-patient ratio on nurse workload and care quality using discrete event simulation. *J Nurs Manag* 2019; 27(5): 971-80. DOI: 10.1111/jonm.12757
13. Kai Tiaki Nursing New Zealand: New Zealand has high nurse turnover rates. *Kai Tiaki Nursing New Zealand* 2018; 24(7): 6-6.
14. Cline D, La Frenz K, Fellman B: Longitudinal outcomes of an institutionally developed nurse residency program. *Journal Nursing Administration* 2017; 47(7): 384-90. DOI: 10.1097/NNA.0000000000000500.
15. Read E, Laschinger HKS: Transition experiences, intrapersonal resources, and job retention of new graduate nurses from accelerated and traditional nursing programs: A cross-sectional comparative study. *Nurse Educ Today* 2017; 59: 53-8. DOI: 10.1016/j.nedt.2017.08.014
16. Koontz M: How to create a good work atmosphere. Retrieved from: <https://www.tbd.community/en/a/good-work-atmosphere-tips>. Accessed 17 January 2018.