

Positive and negative emotional changes in newly recruited nurses within one year: A Longitudinal Study

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Abstract. Aims and objectives: To explore changes in positive and negative emotions among newly recruited nurses within one year of their employment. Background: New nurses often suffer great emotional shock during the period of adaptation. However, few studies have examined the positive and negative emotions of newly employed nursing staff (new graduated nurses and nurses had previous working experience) in the first year of their employment. Design: This study was a cross-sectional and partly prospective. Methods: This study examined a series of different emotions among newly employed nurses when they joined the hospital and at 3, 6, 9, and 12 months. Convenience sampling was used to recruit participants from a tertiary hospital in China. A self-designed questionnaire was used to measure their emotional changes. Results: The emotional changes of nurses ($N=172$) within one year of employment have stages. The proportion of nurses with positive emotions decreased within 3 months of employment, increased after 3 months of employment, and gradually stabilized after 6 months of employment ($p > 0.05$). As a whole, the negative emotions of new nurses gradually eased with the extension of employment time, and the proportion of nurses with mild negative emotions increased within 3 months of employment, while the proportion of nurses with negative emotions decreased significantly within 3-6 months of employment ($p < 0.05$). Conclusions: There is a significant stage difference in the positive and negative emotional responses of newly hired nurses. Relevance to clinical practice: Our study indicates that during the 3-6 months of their employment is the best time to intervene the emotional changes of newly recruited nurses. Nurse managers and head nurses must work together to support newly employed nurses in individualized emotional management, doing so to improve the nursing staff retention rate and reduce levels of negative emotions.

Keywords: new employed nurses, positive and negative emotions, longitudinal study.

What does this paper contribute to the wider global clinical community?

- The results highlight and confirm new employed nurses would experience a series of positive and negative emotional changes at different time periods during their first year of employment.
- Implication for clinical nursing management: this research may provide a better understanding and be useful when planning interventions and coping strategies in emotional care for new recruited nurses.
- This study just measured emotional changes of new graduated nurses and nurses who had previous working experience, while the latter group of nurses for their emotional issues may need to further exploration in future research.

1. Introduction

Nurses are the largest component of the healthcare industry, and the shortage of nurses and the high turnover rate of nurses are common problems worldwide (Drennan & Ross, 2019; Zhang, 2019). As a new force in the nursing team, new nurses face greater psychological challenges due to changes in their roles, environment, interpersonal relationships, and other aspects. They are prone to negative emotions, which may lead to low retention intention and waste of nursing human resources (Zhang, 2019; Wang et al., 2022). Li et al. (2020) indicated that 6.7% of new nurses have a high turnover

intention. Positive and negative emotions are the "barometer" of psychological efficacy. It is of great significance to explore the characteristics of positive and negative emotions of new nurses in the first year of employment, to maintain their mental health, to ensure the stability of the nursing team, and to improve the quality of nursing services. In recent years, the psychological status of newly recruited nurses has attracted more and more attention (Li et al., 2021). Previous studies have focused on the psychological intervention and correlation studies of new nurses (Ye et al., 2016; Meng et al., 2019; Zhang et al., 2021; Lu et al., 2019). This study aims to understand the longitudinal change characteristics of positive and negative emotions of new nurses within one year of employment and provide evidence for nursing managers to carry out emotional management support for new nurses.

2. METHODS

This study used a prospective longitudinal design, which was conducted between October and November 2022.

2.1. Participants

Convenient sampling method was used to select nursing staff who joined the hospital from July 2019 to September 2021. Inclusion criteria: (1) Possess a Chinese nurse professional qualification certificate; (2) Newly joined the hospital to engage in clinical nursing work; (3) Informed consent and voluntary participation in the investigation. Exclusion criteria: Exclude those who had left within one year of employment.

2.2. Instrument

A self-designed questionnaire was used, consisting of two parts. The first part was the basic information of these newly recruited nurses, including positions, professional titles, education background, whether they have clinical work experience, etc. The second part was for nurses to describe their feelings about clinical work at the time of admission (T0), Month 3 (T1), Month 6 (T2), Month 9 (T3), and Month 12 (T4). For the emotion categories, when entering the job, it included excitement and anticipation, confidence, enthusiasm (positive emotions); nervousness and anxiety, fear and worry, lack of confidence, confusion, pressure (negative emotions); dull, others (neutral emotions). At Month 3 (T1), Month 6 (T2), Month 9 (T3), and Month 12 (T4), their feelings about clinical work include confidence, competence, liking and sense of accomplishment (positive emotions); Anxiety, fear, pressure, resistance, confusion, frustration (negative emotions); Dull, other (neutral emotions). (Note: Each participant can choose at most 5 items in each period).

2.3. Data collection

Set a unified filling guide for the questionnaire, sending the questionnaire link through electronic work email. Participants would fill it out anonymously.

2.4. Data analysis

SPSS26.0 software was used for data analysis. The frequency and percentage were used for statistical description, and Pearson χ^2 test (Chi-squared test) and Fisher exact test were used for statistical analysis. $p < 0.05$ was used as the statistically significant difference.

2.5. Ethical consideration

The researcher explained the purpose and procedure of this study as well as their right not to participate without consequence, and the confidentiality of their data. The participating nurse gave their informed consent prior to filling out the questionnaires.

3. Results

A total of 234 survey questionnaires were distributed, the number of effective respondents was 172, with an effective recovery rate of 73.50%. The newly recruited nurses in this batch were mainly registered nurses (121/70.3%) and nurses (120/69.8%). The highest education degree was undergraduate (144/83.7%), and most of them have clinical work experience (136/79.1%).

3.1. The overall changes in emotions during different time periods

The trend Chi-square test was used to analyse the overall distribution of emotional changes of newly recruited nurses in different time periods, and the results showed that there were statistically significant differences in the overall distribution of emotional changes in different time periods ($p < 0.001$). That is, with the extension of employment time, the number of people with negative emotions tends to decrease, while the number of people with positive emotions tends to increase. See Table 1.

Table 1. Comparison of emotional changes at different time periods (N=172)

Time	Emotional categories [n, %]			Pearson χ^2	p
	negative emotions	positive emotions	neural emotions		
T0	110 [64.0%]	59 [34.3%]	3 [1.7%]	35.771	<0.001
T1	107 [62.2%]	48 [27.9%]	17 [9.9%]		
T2	82 [47.7%]	69 [0.1%]	21 [12.2%]		
T3	73 [42.4%]	77 [44.8%]	22 [12.8%]		
T4	67 [39.0%]	82 [7.7%]	23 [13.4%]		

3.2. Characteristics of positive and negative emotions in different time periods

It can be seen from the pairwise comparison results of emotional changes in different time periods of employment (see Table 2) and the trend chart of emotional changes in different time periods (see Figure 1).

The characteristics of nurses' negative emotion changes within one year of employment are as follows: the overall distribution of negative emotions has no statistical difference between T0 and T1 ($p > 0.05$). There was a statistically significant difference in the overall distribution (downward trend) of negative emotions between T1 and T2, T3, T4 ($p < 0.05$). There was no significant difference in the overall distribution (downward trend) of negative emotions by pairwise comparison between T2, T3, and T4 ($p > 0.05$). This indicated that nurses gradually alleviated their negative emotions after joining the workforce, and the proportion of nurses with negative emotions showed a significant decrease during the 3-6 months period of employment ($p < 0.05$). Subsequently, the overall proportion of negative emotions decreased slowly during the 6-12 months of their employment ($p > 0.05$).

The characteristics of positive emotional changes in nurses within one year of employment: there was no statistically significant difference in the overall distribution of positive emotions by pairwise comparison between T0, T1, T2, T3 and T4 ($p > 0.05$). There was no statistically significant difference in the overall distribution of positive emotions between T1 and T2 ($p > 0.05$). However, there was a statistically significant difference in the overall distribution (upward trend) of positive emotions between T1 and T3, T4 ($p < 0.05$). There was no statistically significant difference in the overall distribution (upward trend) of positive emotions by pairwise comparison between T2, T3, and T4 ($p > 0.05$). This indicated that the overall proportion of positive emotions among nurses had a decreasing trend within 3 months of employment ($p > 0.05$), while the overall proportion of positive emotions showed an upward trend after 3 months of employment ($p > 0.05$). After 6 months, the overall proportion of positive emotions among nurses gradually stabilized ($p > 0.05$).

Table 2. Pairwise comparison of emotional changes at different time periods ($N=172$)

Time	Emotional categories			Pearson χ^2	p
	negative emotions	positive emotions	neural emotions		
T0	110a	59a,b	3a	44.732	<0.001
T1	107a,b	48b	17b		
T2	82b,c	69a,b	21b		
T3	73c	77a	22b		
T4	67c	82a	23b		

Note: Each lowercase letter indicates a subset of the employment time categories, and at the level of 0.05, there is no significant difference between the column proportions of these categories. That is, if the subscripts have the same letters, there is no statistical significance between them.

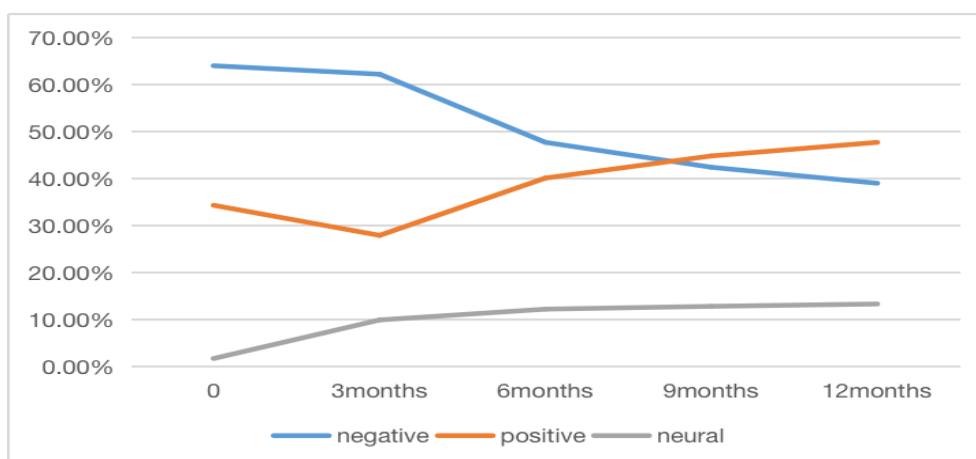


Figure 1. Changes in emotions at different time periods

3.3. Comparison of the severity of negative emotions at different time periods

From the pairwise comparison results of the severity of negative emotions at different time periods of employment (see Table 3) and the trend chart of the severity of negative emotions at different time periods (see Figure 2), we can see that, (1) There was no statistically significant difference in the overall distribution of mild negative emotions at T0 and T1 ($p>0.05$). There was a statistical difference in the overall distribution of mild negative emotions by pairwise comparison between T0, T2, T3, and T4 ($p<0.05$). There was no significant difference in the overall distribution of mild negative emotions by pairwise comparison between T1, T2, T3, and T4 ($p>0.05$). This suggested that the overall proportion of mild negative emotions in the first 3 months of employment showed an increasing trend ($p>0.05$), and the overall proportion of mild negative emotions showed a slow downward trend after 3 months of employment ($p>0.05$). (2) There are statistical differences in the overall distribution of moderate negative emotions between T0 and T1, T2, T3, T4 ($p<0.05$); There was no statistically significant difference in the overall distribution of moderate negative emotions by pairwise comparison between T1, T2, T3, and T4 ($p>0.05$). This suggested that the moderate negative emotions decreased significantly within 3 months of employment ($p<0.05$), and after 3 months of employment, the downward trend of moderate negative emotions remained stable. (3) Pairwise comparisons at T0, T1, T2, and T3 found that the overall distribution of severe negative emotions did not change significantly within 9 months ($p>0.05$).

Table 3. Pairwise comparison of negative emotions at different time periods (N=172)

Time	Negative emotions			Pearson χ^2	<i>p</i>
	mild	moderate	severe		
T0(n=110)	47a	57a	6a	37.581	<0.001
T1(n=107)	65a,b	33b	9a		
T2(n=82)	59b	20b	3a		
T3(n=73)	54b	18b	1a		
T4(n=67)	51b	16b	0		

Note: Only one of the above-mentioned negative emotions is defined as mild, 2-3 negative emotions are moderate, and 4-5 negative emotions are severe.

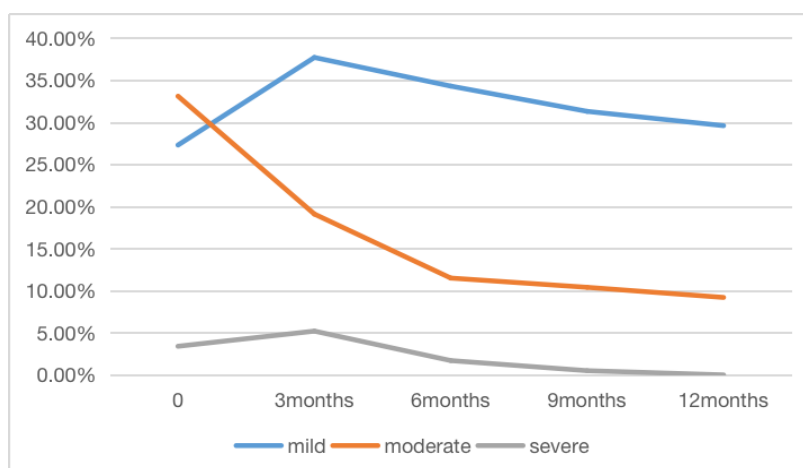


Figure 2. Changes of negative emotions at different time periods

3.4. Negative emotions at different time periods

According to the statistical results of negative emotions at different time periods (see Table 4), feeling stressed is the main psychological state of newly hired nurses within a year. After 3 months of employment, the feeling of stress was the strongest and gradually alleviated. 32.6% of nurses still felt obvious pressure on clinical work after 12 months of employment.

Table 4. The number of negative emotions at different time periods (N=172)
(frequency/percentage)

Items	nervousness and anxiety	fear and worry	confusion	pressure	lack of confidence	resistance	frustration
T0	53 (30.8%)	29 (16.9%)	14 (8.1%)	88 (51.2%)	16 (9.3%)	-	-
T1	30 (17.4%)	12 (7.0%)	20 (11.6%)	101 (58.7%)	-	8 (4.7%)	13 (7.6%)
T2	13 (7.6%)	4 (2.3%)	11 (6.4%)	80 (46.5%)		2 (1.2%)	4 (2.3%)
T3	9 (5.2%)	3 (1.7%)	11 (6.4%)	66 (38.4%)		5 (2.9%)	2 (1.2%)
T4	10 (5.8%)	3 (1.7%)	6 (3.5%)	56 (32.6%)		6 (3.5%)	4 (2.3%)

Note: Each person can choose up to 5 options in each period, with "-" indicating that the option is not included in that stage.

4. Discussion

4.1. The change of emotional response of newly recruited nurses within a year has staged

The psychological status of new nurses is influenced by many factors, such as their own clinical ability, department teaching, leadership and management, interpersonal relationships, working environment, workload, training and assessment, professional identity, education background, coping style and so on (Zhang et al., 2017; Zhang et al., 2013; Li et al., 2021). The results of this study

indicated that the emotional response of nurses within one year of employment is mainly positive, and previous studies have also shown that the psychological health level of new nurses is relatively good (Zhang et al., 2013). In this study, the specific characteristics of positive and negative emotions of new nurses are that their negative emotions gradually eased after they joined the job, but the proportion of mild negative emotions showed an upward trend within three months of joining the job ($p>0.05$). The proportion of nurses with positive emotions decreased within 3 months of employment and showed an upward trend after 3 months ($p>0.05$). The possible reason is that new nurses are often in an unstable emotional state because of their heavy workload, many training and assessment tasks, and conflicts between their inner expectations and reality while adapting to the new environment, new roles and new interpersonal relationships (Duan & Cheng, 2019). In addition, our hospital requires new nurses to work independently within 6-8 weeks, so more than half (58.7%) nurses feel stressed within 3 months. Nurses are a special profession and there is inevitably some pressure in their work. Mild stress can stimulate nurses' potential to actively respond to clinical challenges, but excessive stress can affect their nursing ability (Zhang et al., 2013). If emotions cannot be adjusted in a timely manner, negative emotions may accumulate and lead to job burnout and turnover intention (Ning et al., 2014; Tao et al., 2022). Therefore, it is necessary to study the phased changes in emotional responses of new nursing staff and propose targeted intervention methods and measures.

4.2. Emphasis should be placed on improving nurses' positive emotions within 3-6 months of employment

According to Duchscher's (2008) new nurse transition theory, the first 3-4 months of a new nurse's employment were considered a transition shock stage. New nurses enter the clinic with full expectations and may have a series of negative experiences during the adaptation process (Li et al., 2021). This study found that the proportion of nurses with positive emotions decreased within 3 months of employment, and then increased after 3 months, and the overall proportion of positive emotions gradually stabilized after 6 months of employment, which may be due to it is becoming increasingly adapted to the role of nurses, and negative emotions such as stress are gradually healing (Wang et al., 2022), suggesting that nursing managers can actively take intervention measures within 3-6 months of entry to help more newly recruited nurses transition to nurses. Positive emotions.

4.3. Actively intervenes in nurses' negative emotions within 3-6 months of employment

The research results of Zhang et al. (2019) found that the work pressure of new nurses is generally at the upper-middle level within one year, and the pressure level is the highest at 4 months after entering the job. Li et al. [2021] believed that new nurses generally have negative emotions in the early stages of clinical work (3-4 months). Similarly, the survey results of this study showed that the proportion of nurses with negative emotions (107/172, 62.2%) and the proportion of nurses with stress reached the highest (101/172, 58.7%) after 3 months of employment. Working time can weaken the impact of new nurses' transition shock (Duan & Cheng, 2019). This study further indicated that negative emotions among nurses gradually ease with the duration of employment, with the proportion of nurses with positive emotions (77/172, 44.8%) surpassing the proportion of nurses with negative emotions (73/172, 42.4%) by 9 months of employment. In addition, the results of this study showed that 3-6 months of employment is a stage in which the overall proportion of negative emotions is significantly reduced, suggesting that if nursing managers take intervention measures at this stage, it is easier to reduce the proportion of nurses with negative emotions. Its positive emotions, such as improving the teaching behavior of clinical teachers, creating a bullying-free working environment, implementing the transformational leadership model of head nurses, formulating reasonable training and assessment plans, focusing on career development and support systems, using incentive mechanisms, and improving nurses' welfare, providing psychological counseling, etc. to reduce the emotional consumption of newly recruited nurses and help them better adapt to nursing work with

positive coping methods(Kim & Yeo, 2019; Yu et al., 2018; Zuo et al., 2020; Cao et al., 2014; Li et al., 2020; Pan & Peng, 2019).

4.4. Limitations

This study has some limitations. First, since all our participants worked in a specialized hospital, and most were females, and this study only conducted a retrospective survey on newly recruited nurses, and most of them had more than 1 year of clinical work experience before employment, the results might not be transferable to other medical organizations. Second, further in-depth qualitative interviews should be conducted with newly recruited nurses with different working years to understand their real experience and emotional needs.

5. Conclusion

This longitudinal study investigated the emotional changes in newly employed nurses within one year, we found that within three months of employment, nurses' positive emotional reactions will decrease; however, the negative emotions of newly hired nurses generally gradually alleviate with the extension of their employment time, and overall, the emotions among them within one year are mainly positive.

6. Implications for practice

Turnover is an important reason for the shortage of nurses in the world. New nurses are easily affected by negative emotions and burnout during the adaptation period, which poses challenges to the improvement of nursing quality and talent retention. The results of this study suggest that while new nurses are adapting to clinical work, nursing managers should pay attention to the changes in the emotional reactions of new nurses, especially during the 3-6 months of their employment.

Acknowledgment

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Conflict Of Interest Statement

The authors declare that they have no conflict of interests.

Data Availability

The data are not publicly available due to privacy or ethical restrictions.

References

- [1] Drennan, V. M., & Ross, F. (2019). Global nurse shortages-the facts, the impact and action for change. *Br. Med Bull*, 130 (1), 25 - 37. <https://doi.org/10.1093/bmb/ldz014>.
- [2] Duchscher J. B. (2008). A process of becoming: the stages of new nursing graduate professional role. transition. *Journal of continuing education in nursing*, 39 (10), 441 – 480. <https://doi.org/10.3928/00220124-20081001-03>.
- [3] Kim, E. Y., & Yeo, J. H. (2019). Effects of pre-graduation characteristics and working environments on. transition shock of newly graduated nurses: A longitudinal study. *Nurse education today*, 78, 32 – 36. <https://doi.org/10.1016/j.nedt.2019.04.002>.
- [4] Li, Z., Cao, J., Wu, X., Li, F., & Zhu, C. (2020). Intention to leave among newly graduated nurses: A. descriptive, multicenter study. *Journal of advanced nursing*, 76 (12), 3429 – 3439. <https://doi.org/10.1111/jan.14545>.

- [5] Yu, M. F., Liu, Y., & Wang, H. (2018). Correlation between transition shock and coping style, and social support among new nurses. *Journal of Nursing Science*, 33 (10), 83 - 85. <https://doi.org/10.3870/j.issn.1001-4152.2018.10.083>.
- [6] Ye, Y., Ni, J. Y., Wan, J. B., & Tan, M. J. (2016). Study on status quo and correlation of social anxiety and resilience level of new nurses. *Chinese Nursing Research*, 30 (17), 2104 - 2107. <https://doi.org/10.3969/j.issn.1009-6493.2016.17.017>.
- [7] Meng, Z. X., Niu, J., Cai, X. R., & Liu, G. Q. (2019). The influence of positive psychology group counseling on the transition shock of newly graduated nurses. *Chinese Nursing Management*, 19 (09), 1339 - 1342. <https://doi.org/10.3969/j.issn.1672-1756.2019.09.012>.
- [8] Ning, L., Li, Y. M., Lu, J., Lin, L. J., & Cai, L. Z. (2014). Investigation on anxiety level and influence factors in new nurses. *Chinese Journal of Modern Nursing*, (36), 4584 - 4587. <https://doi.org/10.3760/j.issn.1674-2907.2014.36.017>.
- [9] Zuo, Y. M., Su, Q., Yun, B., Liu, J., Chen, L., & Han, L. (2020). Status and Relationship between Clinical Teaching Behaviors and Transition Shock for Newly Graduated Nurses. *Military Nursing*, 37 (3), 46 - 49, 71. <https://doi.org/10.3969/j.issn.1008-9993.2020.03.013>.
- [10] Zhang, Y. Y. (2019). The Development and Effectiveness of Occupational Stress Intervention Program for Newly Graduated Nurses During Transition [doctor, unpublished, Shanghai Jiao Tong University].
- [11] Zhang, Y. Y., Zhang, Y. Q., Qian, P., Chen, L., Xiao, S. M., Wang, J., Wu, J. M., & Wen, F. L. (2017). Occupational stress among new graduate nurses during the first year of transition: a longitudinal study. *Chinese Nursing Management*, 17 (11), 1517 - 1521. <https://doi.org/10.3969/j.issn.1672-1756.2017.11.017>.
- [12] Zhang, G. X., Huang, H. Y., Zhang, A. L., & Gao, S. (2013). Study on new nurses' emotional state and its influencing factors. *Chinese Journal of Modern Nursing*, 19(24), 2889-2893. <https://doi.org/10.3760/cma.j.issn.1674-2907.2013.24.002>.
- [13] Zhang, Y., Yao, X., Wei, Z. H., Liang, H. L., Xue, L. F., & Li, J. L. (2021). The effect of psychological intervention combined with Watson's care theory on the negative emotions of standardized training nurses. *Acta Medicinæ Sinica*, 34 (04), 178 - 181. <https://doi.org/10.19296/j.cnki.1008-2409.2021-04-047>.
- [14] Cao, H. L., Wang, L. H., Ding, A. M., Yang, X. H., & Geng, G. L. (2014). Analysis of psychological resilience level and influencing factors of nurses during standardized training period in tertiary first-class hospitals. *Jiangsu Medical Journal*, 40 (16), 1979 - 1980. <https://doi.org/10.19460/j.cnki.0253-3685.2014.16.055>.
- [15] Li, Q., Yao, W. Y., & Ni, Z. H. (2021). Qualitative study on the stress experience of novice nurses during the initial stage of the clinical work. *Medical Higher Vocational Education and Modern Nursing*, 4 (05), 393 - 397. <https://doi.org/10.3969/j.issn.2096-501X.2021.05.007>.
- [16] Li, Z., Guo, N., Huo, X. P., Jiao, J., & Wu, X. J. (2021). Current research status and focus of new nurses in recent 10 years. *Chinese Journal of Nursing Education*, 18 (07), 606 - 612. <https://doi.org/10.3761/j.issn.1672-9234.2021.07.006>.
- [17] Li, J., Wang, S. H., & Huang, T., Z. (2020). Research progress on status quo and influencing factors of the transition shock of newly graduated registered nurses. *Chinese Nursing Research*, 34 (11), 1974 - 1978. <https://doi.org/10.12102/j.issn.1009-6493.2020.11.021>.
- [18] Duan, L. Y., & Cheng, L. (2019). Research progress on the transition shock of new nurses. *Chinese Nursing Management*, 19 (06), 895 - 899. <https://doi.org/10.3969/j.issn.1672-1756.2019.06.019>.
- [19] Pan, Y. Y., & Peng, Y. (2019). Applied Research on the Relationship between Psychological Resilience of Newly Served Nurses and Change-oriented Leadership Behavior of Head Nurses. *China Health Industry*, 16 (30), 6 - 8+11. <https://doi.org/10.16659/j.cnki.1672-5654.2019.30.006>.
- [20] Wang, Y. Y., Li, L. Z., Zhang, X. Z., Li, N., & Yang, X. W. (2022). Research Progress of Novice Nurses' Transitional Period: Status Quo and Interventions. *Military Nursing*, 39 (04), 74 - 76. <https://doi.org/10.3969/j.issn.1008-9993.2022.04.020>.
- [21] Lu, Y. Y., Cui, Y. Q., & Chu, C. M. (2019). Evaluation of group positive psychotherapy on negative emotions of newly recruited nurses. *Journal of Clinical Nursing in Practice (Chinese and English)*, 5 (07), 159 - 162. <https://doi.org/10.11997/j.issn.201907050>.

- [22] Tao, X. X., Hou, M., Liao, F., Zhang, J., & Ben, Y. L. (2022). Relationship between work readiness and emotional labor in new graduate nurses. *Journal of Nursing Science*, 37 (17), 63 - 65. <https://doi.org/10.3870/j.issn.1001-4152.2022.17.063>.