# Effect of Progressive Muscle Relaxation Exercise on Anxiety among Nursing Students in Pediatric Clinical Training

**Dalia Toqan, MSN, PhD**[1], **Ahmad Ayed, MSN, PhD**[1] (ID),
**Mosab Amoudi, PhD**[2], **Fadwa Alhalaiqa, CSN, PhD**[3],
**Othman A. Alfuqaha, PhD**[4] **and Mohammed ALBashtawy, MPH, PhD**[5]

## Abstract

**Introduction:** Pediatric nursing students are expected to work hard to help children realize their full potential by giving care, knowing their growth process, and being responsive to their needs. Students should be able to communicate effectively and solve problems. Nurses who care for pediatric patients experience compassion fatigue as well as moderate to severe levels of work-related stress. The purpose of this study was to investigate the effect of progressive muscle relaxation exercise on anxiety among nursing students during pediatric nursing clinical training.

**Methods:** A quasi-experimental, pre-post study was conducted in the faculty of nursing at the Arab American University/ Palestine. The sample of the study consists of 60 nursing students enrolled in the pediatric nursing course were selected through convenience sampling. This study was conducted on one group of nursing students that received Jacobson's progressive muscle relaxation exercise for five consecutive days per week for two weeks before entering the clinical environment. The S-anxiety scale (STAI Form Y-1) was applied to collect data before and after the intervention.

**Results:** The magnitude of anxiety after the progressive muscle relaxation exercise was greater reduced than before ($t (59) = 21.1$, $P < 0.05$). There was less anxiety post the program ($M = 1.34 \pm 0.36$) than pre- program ($M = 2.83 \pm 0.35$).

**Conclusion:** The study findings indicated the positive influence of progressive muscle relaxation exercise on nursing students' anxiety levels in pediatric clinical settings. As a result, it is recommended that teaching programs on this approach be conducted for nursing students at nursing schools prior to the commencement of pediatric clinical practice in order to lessen anxiety.

### Keywords
anxiety, clinical setting, pediatric, nursing students, relaxation

## Introduction

Clinical training will enable students to assist a wide range of people, form relationships with them, and acquire problem-solving techniques (Fukada, 2018). This is also important in pediatric nursing practice, where students are expected to work hard to help children realize their full potential by giving care, knowing their growth process, and being responsive to their needs. As a result, students in pediatric nursing practical training should be able to communicate effectively and solve problems (Speedie & Middleton, 2021).

Despite the fact that pediatric nursing training has more restrictions than other nursing programs, clinical experience is an essential component of nursing education (Kim, Lee, & Eo, 2013). However, it has been determined that nurses who care for pediatric patients experience compassion fatigue as well as moderate to severe levels of work-related stress (Aljohani et al., 2021; Labrague et al., 2018; Onieva-Zafra et al., 2020). Pediatric nurses are at a significant risk of anxiety because they are routinely exposed to distressing aspects of childhood illnesses or death, medical treatment or errors, and the family's emotional reaction to childhood disease (Shen et al., 2015; Yoshioka et al., 2021). Anxiety is characterized by doubt about one's

[1]Faculty of Nursing, Arab American University, Palestine
[2]Faculty of Allied Medical Sciences, Arab American University, Palestine
[3]Dean of faculty of nursing / Philadelphia University, Jordan
[4]Department of Nursing, The University of Jordan, Jordan University Hospital, Amman, Jordan
[5]Princess Salma Faculty of Nursing, Al al-Bayt University, Mafraq, Jordan

**Corresponding Author:**
Ahmad Ayed, Faculty of Nursing, Arab American University, Palestine.
Email: ahmad.juma@aaup.edu

ability, and it frequently results in poor academic achievement (Robinson et al., 2013).

Anxiety triggers in nursing students are widely established, with clinical placement anxiety frequently figuring as one of the primary reasons (Alshahrani et al., 2018; Alzayyat, 2016; Blomberg et al., 2014; Hamaideh et al., 2017; Labrague et al., 2018; Galbraith & Brown, 2011; Shaban et al., 2012). Furthermore, anxiety and stress have been recognized as contributors to high levels of burnout among nurses and nursing students, with some studies indicating a negative association between anxiety and academic performance (Hossain, Bent, & Hendren, 2021; Li & Hasson, 2020). Pre-placement anxiety, clinical reality (theory-practice gap), clinical learning, becoming a nurse,' and academic concerns were highlighted as persistent themes (Chernomas & Shapiro, 2013; Thomas et al., 2012). Fear of making errors, problems pertaining to death and dying, experiencing pain and suffering, relationships with instructors, being observed and assessed, and attempting to balance academic, clinical, and personal responsibilities are additional sources of stress in clinical placement (McKenna & Plummer, 2013; Chernomas & Shapiro, 2013; Liu et al., 2015). Students and faculty must collaborate to develop practical techniques to support student nurses in avoiding, minimizing, or resolving psychological harm (Otim, et al., 2021). Students' academic stress can be reduced by using relaxation techniques (Manansingh, et al., 2019). Some studies have recommended that the progressive muscle relaxation (PMR) exercise be used throughout nursing courses to increase student satisfaction and positive outlooks (Bostani, et al., 2020). Progressive muscle relaxation is a deep muscle relaxation method based on the principle that muscle tension is the physiological response of the human body to irritating thoughts (Cougle et al., 2020). This technology was developed by Jacobsen in 1938, in which the body and mind are greatly relieved from any tension and anxiety. These activities build students' resilience using behavioral antibodies (conditioning) and expose them to triggers that enable them to handle the stress of academic pressure (Hallman et al., 2011).

The main idea of PMR is to teach individuals how to intentionally inhibit their muscle tension and, as a consequence, reduce their degree of anxiety. Convenience, cost-effectiveness, and independence of practice are among the key benefits of this strategy in anxiety reduction and management. Nursing is demanding for nursing students and contributes to their anxiety as a result of the amount of educational material they must learn as well as the stressful clinical setting. Individuals' perceptions of their ability to cope with day-to-day stressors may shift, and PMR can be used to reduce students' anxiety. Furthermore, few stress management techniques target students at times when they are most stressed, such as during clinical placements, when they are prone to being alone and without the assistance of other students or instructors. As a result, it is advocated that nursing students benefit from an intervention that is immediately available to them. Therefore, the purpose of the current study was to investigate the effect of PMR on anxiety among nursing students during pediatric nursing clinical training.

## Methods

### Study Design, Site, and Participants

The current study was a quasi-experimental, pre and post-design study. The study was conducted at the Faculty of Nursing, Arab American University/Palestine, and was conducted in 2020. The sample included 60 pediatric nursing students in a bachelor's program in nursing. This pediatric nursing course is composed of two parts: theory and clinical. This course is in the third year of the nursing program. There were 60 students enrolled in this course. The inclusion criteria were nursing students enrolled in a pediatric nursing course. Exclusion criteria included a history of psychological illnesses, skipping more than two intervention meetings, using sedatives, and being exposed to stressful situations in the previous three months.

## Intervention

This study was conducted on one group that received Jacobson's PMR exercise. Jacobson's muscle relaxation was implemented at the faculty of nursing for five consecutive days per week. The researchers first met the course coordinator at the nursing faculty and asked him to serve as a liaison to approach students in the pediatric health nursing course. The coordinator's role was restricted to approaching and informing the students about the study and its purpose and inviting them to participate in the study. In addition, the announcement about the study was positioned on the students' board and electronic contact links in coordination with the nursing department administrator. The coordinator then invited the researcher to provide students who display a desire to take part in the study with the information related to the study. The researcher provided information about the aim, content, and duration of the research and what participants were required to do.

The informed consent forms were signed by the students who stated an interest in participating in the study and met the inclusion criteria. Students received printed information about the date and time of the study. On the first day of the intervention, the participants filled in the demographic part and the STAI questionnaire. The intervention was held two weeks before the start of pediatric clinical training. Again, they completed the STAI questionnaire for the second time on the day they entered the clinical environment.

## Jacobson's PMR

Jacobson's PMR exercise has been applied in some studies (Bostani et al., 2020; Jacobson, 1987). This exercise was

implemented for 60 participants in groups of ten over five consecutive 45-min sessions each week for two weeks. The researcher emphasized to the students at the start of the first session that the exercise's purpose was to assist them in minimizing muscular tension. Additionally, he instructed the students not to leave the meetings and to attend all sessions. In other sessions, the researchers implemented the PMR exercise. In this exercise, "muscle groups are considered as follows: hand and forearm, upper arm, forehead, eyes and cheeks, mouth and jaw, neck, shoulders, shoulder blades, chest and stomach, hips and buttocks, upper leg, lower leg, and foot. These muscles should be contracted and relaxed in the stated order" (Table 1) (Ramasamy et al., 2018). Whereas the researcher was using this exercise, the students felt at ease on the ground. Students had been encouraged ahead of time to wear comfortable clothes in order to avoid tension. Also, the students were instructed to complete each training session at home for 10–15 min each day. Students were instructed at the end of every session to continue implementing relaxing exercises at home.

## Study Instrument

### Socio-Demographic Information

Demographic characteristics of the participants included age, gender.

**Table 1.** Progressive Muscle Relaxation (PMR) Exercise.

| Part of body | Exercise |
| --- | --- |
| Hand & forearm | Clench your hand into a fist |
| Upper arm | Raise your right forearm and flex your bicep - "make a muscle" |
| Forehead | Raise your eyebrows as much as you can, as if you were startled or shocked |
| Eyes and cheeks | Close your eyes very tightly |
| Mouth and jaw | Open your mouth, as wide as you comfortably can |
| Neck | Remain cautious when you flex the muscle. Stand straight and keep your eyes facing forward and then slowly bend your neck backwards (look up at the ceiling) |
| Shoulders | Tense your shoulder muscles while you raise them, as if to shrug them |
| Shoulder blades | Pull back your shoulders as much as possible so that your chest sticks out |
| Chest and stomach | Take a breath, deep enough to fill your lungs |
| Hips and buttocks | Tense your buttock muscles |
| Upper leg | Flex both your thighs |
| Lower leg | To prevent cramps, do this gently and be careful. To stretch your calf muscles, draw your toes towards yourself |
| Foot | Bend down your toes |

### State-Trait Anxiety Inventory (STAI)

The self-evaluation STAI questionnaire, developed by Spielberger (1983), includes separate scales for measuring state (S-scale) and trait (T-scale) anxiety. In the present study, only the S-anxiety scale (STAI Form Y-1) was used. The questionnaire consisted of 20 items that evaluated how the participants felt at the time of responding to each item. Note that 10 items were associated with the anxiety-present (items 3, 4, 6, 7, 9, 12, 13, 14, 17, 18) and the remaining items were associated with the anxiety-absent (items 1, 2, 5, 8, 10, 11, 15, 16, 19, 20). The intensity of the participants' feelings was rated on a 4-point Likert scale as (I) not at all, (II) somewhat, (III) moderately so, and (IV) very much so. The anxiety present items were scaled from 1 to 4, such that higher scores indicated the presence of a high level of anxiety "(Spielberger, 1983). However, "the anxiety-absent items were scaled in reverse from 4 to 1. The total score for the STAI Form Y-1 ranged from a minimum of 20 to a maximum of 80. The reliability of the questionnaire ranged between 0.86 and 0.95 (Spielberger, 1983).

### Ethical Consideration

The study was approved by the Arab American University Institutional Review Board (IRB00098914). All participants completed written informed consent forms after receiving formal approval from the Arab American University. Also, the study's purpose, as well as the risks and benefits of participation, were described to the students. Additionally, the participant was informed about the possible negative effects of PMR, such as fear of relaxing, elevated levels of physiological activation, and so on. They were instructed to contact the researcher (second author) if any undesirable effects occurred. They were also told that they might opt out of the research at any time. Moreover, confidentiality was taken into account in this study, and all participants' information was maintained in a closed file cabinet with limited access. Furthermore, each participant is identified by a code number.

## Results

### Sample Description

A total of 60 participants completed the study. The analysis showed that the mean age of nursing students was 21.22(SD = 1.8) years. The majority of the sample were females 48(80.0%), as seen in (Table 2). The analysis

**Table 2.** Demographic Characteristics of Participants (N = 60).

| | | n(%) | M(SD) |
| --- | --- | --- | --- |
| Age (years) | | | 21.22(1.8) |
| Gender | Male | 12(20.0) | |
| | Female | 48(80.0) | |

**Table 3.** Distribution of the Anxiety Items among the Participants (N = 60).

| | Item | Not at all | Somewhat | Moderately so | Very much so |
|---|---|---|---|---|---|
| 1 | I feel calm | 0(0.0) | 36(60.0) | 24(40.0) | 0(0.0) |
| 2 | I feel secure | 21(35.0) | 19(31.7) | 16(26.7) | 4(6.7) |
| 3 | I am tense | 3(5.0) | 7(11.7) | 44(73.3) | 6(10.0) |
| 4 | I am regretful | 8(13.3) | 6(10.0) | 40(66.7) | 6(10.0) |
| 5 | I feel at ease | 22(36.7) | 22(36.7) | 14(23.3) | 2(3.3) |
| 6 | I feel upset | 2(3.3) | 6(10.0) | 47(78.3) | 5(8.3) |
| 7 | I am currently worried about possible misfortunes | 8(13.3) | 15(25.0) | 30(50.0) | 7(11.7) |
| 8 | I feel rested | 22(36.7) | 23(38.3) | 12(20.0) | 3(5.0) |
| 9 | I feel anxious | 0(0.0) | 1(1.7) | 54(90.0) | 5(8.3) |
| 10 | I feel comfortable | 21(35.0) | 17(28.3) | 18(30.0) | 4(6.7) |
| 11 | I feel self-confident | 8(13.3) | 35(58.3) | 15(25.0) | 2(3.3) |
| 12 | I feel nervous | 3(5.0) | 2(3.3) | 49(81.7) | 6(10.0) |
| 13 | I am jittery | 18(30.0) | 4(6.7) | 33(55.0) | 5(8.3) |
| 14 | I feel "high-strung" | 29(48.3) | 3(5.0) | 22(36.7) | 6(10.0) |
| 15 | I am relaxed | 19(31.7) | 24(40.0) | 15(25.0) | 2(3.3) |
| 16 | I feel content | 7(11.7) | 26(43.3) | 24(40.0) | 3(5.0) |
| 17 | I am worried | 1(1.7) | 9(15.0) | 43(71.7) | 7(11.7) |
| 18 | I feel overexcited and rattled | 8(13.3) | 25(41.7) | 21(35.0) | 6(10.0) |
| 19 | I feel joyful | 25(41.7) | 20(33.3) | 11(18.3) | 4(6.7) |
| 20 | I feel fine | 25(41.7) | 17(28.3) | 15(25.0) | 3(5.0) |

**Table 4.** Comparison Between Anxiety Before and After PMR (N = 60).

| Variable | n | M (SD) | Statistical test | |
|---|---|---|---|---|
| | | | Paired t test | P. Value |
| Anxiety score | | | | |
| Pre-exercise | 60 | 2.83 ± 0.35 | 21.1 | 0.001 |
| Post-exercise | 60 | 1.34 ± 0.36 | | |

P. value significant at the 0.05 level.

revealed that most of the partcipants 54(90.0%) answered moderately so for the item "I feel anxious", 49(81.7%) for the item "I feel nervous", 47(78.3%) for the item "I feel upset", as seen in (Table 3).

A paired t- test was performed to assess the differences between pre and post progressive muscle relaxation. The analysis revealed significant differences between pre and post the progressive muscle relaxation program (t (59) = 21.1, P < 0.05). There was less anxiety post program (M = 1.34 ± 0.36) than pre- program (M = 2.83 ± 0.35), as seen in (Table 4).

## Discussion

The findings of the study revealed that practicing PMR is beneficial in lowering the mean score of pediatric clinical training anxiety among nursing students. These results supported by Zargarzadeh et al. (2014), confirmed that relaxation training had a significant impact on students' test anxiety reduction. Another study, Ahmadnejad et al. (2011), evaluated the effects of relaxation therapy on anxiety reduction in a clinical setting among school students and found it to be effective. Also, Heidari et al. (2011) found that educating muscular relaxation and the gradual removal of tension, along with biofeedback, dramatically reduces students' anxiety. Furthermore, Korkut et al. (2021) found that students who practiced muscular relaxation had lower anxiety levels than those in the control group.

In a study on the effectiveness of PMR on nursing students, Gangadharan and Madani (2018) found that the participants had a substantial drop in their anxiety level following the intervention. Also, another study undertaken on nurses by Patel (2014) indicated that in pre-test, 53.3% of the nurses had moderate stress, 40.0% had mild stress, and 6.7% had severe stress. In the posttest, 73.3% of nurses reported mild stress, whereas 26.7% reported no stress. The study concluded that Progressive Muscle Relaxation Therapy is beneficial in lowering the stress level of staff nurses. The limitations of the current study are that the sample was quite small and the intervention was conducted in one clinical practice period and at one university. Hence, this will limit the generalizability of the findings.

## Conclusion

The study's findings indicated the positive influence of progressive muscle relaxation exercise in pediatric clinical setting anxiety reduction on nursing students. As a result, it is recommended that teaching programs on this approach be conducted for nursing students at nursing schools prior to the commencement of pediatric clinical practice in order to lessen anxiety.

## ORCID iD

Ahmad Ayed https://orcid.org/0000-0003-2164-8183

## References

Ahmadnejad, S., Monjamed, Z., Pakravannejad, M., & Malekian, A. (2011). The effect of relaxation training on first year nursing students' anxiety in clinical setting. *Anxiety*, *20*, 17. https://doi.org/10.5281/zenodo.1333540

Aljohani, W., Banakhar, M., Sharif, L., Alsaggaf, F., Felemban, O., & Wright, R. (2021). Sources of stress among Saudi Arabian nursing students: A cross-sectional study. *International Journal of Environmental Research and Public Health*, *18*(22), 11958. https://doi.org/10.3390/ijerph182211958

Alshahrani, Y., Cusack, L., & Rasmussen, P. (2018). Undergraduate nursing students' strategies for coping with their first clinical placement: Descriptive survey study. *Nurse Education Today*, *69*, 104–108. https://doi.org/10.1016/j.nedt.2018.07.005

Alzayyat, A. (2016). Perceived stress and coping strategies among Jordanian nursing students during clinical practice in psychiatric/mental health courses. *European Psychiatry*, 33, S190.

Blomberg, K., Bisholt, B., Kullén Engström, A., Ohlsson, U., Sundler Johansson, A., & Gustafsson, M. (2014). Swedish Nursing students' experience of stress during clinical practice in relation to clinical setting characteristics and the organisation of the clinical education. *Journal of Clinical Nursing*, *23*(15–16), 2264–2271. https://doi.org/10.1111/jocn.12506

Bostani, S., Rambod, M., Irani, P. S., & Torabizadeh, C. (2020). Comparing the effect of progressive muscle relaxation exercise and support group therapy on the happiness of nursing students: A randomized clinical trial study. *International Journal of Africa Nursing Sciences*, *13*, 100218. https://doi.org/10.1016/j.ijans.2020.100218

Chernomas, W. M., & Shapiro, C. (2013). Stress, depression, and anxiety among undergraduate nursing students. *International Journal of Nursing Education Scholarship*, *10*(1), 255–266. https://doi.org/10.1515/ijnes-2012-0032

Cougle, J. R., Wilver, N. L., Day, T. N., Summers, B. J., Okey, S. A., & Carlton, C. N. (2020). Interpretation bias modification versus progressive muscle relaxation for social anxiety disorder: A web-based controlled trial. *Behavior Therapy*, *51*(1), 99–112. https://doi.org/10.1016/j.beth.2019.05.009

Fukada, M. (2018). Nursing competency: Definition, structure and development. *Yonago Acta Medica*, *61*(1), 1–7. https://doi.org/10.33160/yam.2018.03.001

Galbraith, N. D., & Brown, K. E. (2011). Assessing intervention effectiveness for reducing stress in student nurses: Quantitative systematic review. *Journal of Advanced Nursing*, *67*(4), 709–721. https://doi.org/10.1111/j.1365-2648.2010.05549.x

Gangadharan, M. P., & Madani, M. A. H. (2018). Effectiveness of progressive muscle relaxation techniques on depression, anxiety and stress among undergraduate nursing students. *International Journal of Health Sciences and Research*, *8*(2), 155–163.

Hallman, D. M., Olsson, E. M., Von Schéele, B., Melin, L., & Lyskov, E. (2011). Effects of heart rate variability biofeedback in subjects with stress-related chronic neck pain: A pilot study. *Applied Psychophysiology and Biofeedback*, *36*(2), 71–80. https://doi.org/10.1007/s10484-011-9147-0

Hamaideh, S. H., Al-Omari, H., & Al-Modallal, H. (2017). Nursing students' perceived stress and coping behaviors in clinical training in Saudi Arabia. *Journal of Mental Health*, *26*(3), 197–203. https://doi.org/10.3109/09638237.2016.1139067

Heidari, A., & Saedi, S. (2011). The effect of relaxation and gradual stress removal accompanied by biofeedback on the anxiety of the students. *Journal of Knowledge and Research in Applied Psychology*, *12*(3), 4–11.

Hossain, B., Bent, S., & Hendren, R. (2021). The association between anxiety and academic performance in children with reading disorder: A longitudinal cohort study. *Dyslexia (Chichester, England)*, *27*, 342–354. https://doi.org/10.1002/dys.1680

Jacobson, E. (1987). Progressive relaxation. *The American Journal of Psychology*, *100*(3/4), 522–537. https://doi.org/10.2307/1422693

Kim, J., Lee, A. R., & Eo, Y. (2013). Clinical practice performance according to type of practices and satisfaction of clinical practice in students at child health nursing. *The Journal of Korean Academic Society of Nursing Education*, *19*(4), 542–548. https://doi.org/10.5977/jkasne.2013.19.4.542

Korkut, S., Ülker, T., Çidem, A., & Şahin, S. (2021). The effect of progressive muscle relaxation and nature sounds on blood pressure measurement skills, anxiety levels, and vital signs in nursing students. *Perspectives in Psychiatric Care*.

Labrague, L. J., McEnroe-Petitte, D. M., Papathanasiou, I. V., Edet, O. B., Tsaras, K., Leocadio, M. C., & Velacaria, P. I. T. (2018). Stress and coping strategies among nursing students: An international study. *Journal of Mental Health*, *27*(5), 402–408. https://doi.org/10.1080/09638237.2017.1417552

Li, Z. S., & Hasson, F. (2020). Resilience, stress, and psychological well-being in nursing students: A systematic review. *Nurse Education Today*, *90*, 104440. https://doi.org/10.1016/j.nedt.2020.104440

Liu, M., Gu, K., Wong, T. K., Luo, M. Z., & Chan, M. Y. (2015). Perceived stress among macao nursing students in the clinical learning environment. *International Journal of Nursing Sciences*, *2*(2), 128–133. https://doi.org/10.1016/j.ijnss.2015.04.013

Manansingh, S., Tatum, S. L., & Morote, E. S. (2019). Effects of relaxation techniques on nursing students' academic stress and test anxiety. *Journal of Nursing Education*, *58*(9), 534–537. https://doi.org/10.3928/01484834-20190819-07

McKenna, L., & Plummer, V. (2013). Indonesian Student nurses' perceptions of stress in clinical learning: A phenomenological study. *Journal of Nursing Education and Practice*, *3*(5), 56–65.

Onieva-Zafra, M. D., Fernández-Muñoz, J. J., Fernández-Martínez, E., García-Sánchez, F. J., Abreu-Sánchez, A., & Parra-Fernández, M. L. (2020). Anxiety, perceived stress and

coping strategies in nursing students: A cross-sectional, correlational, descriptive study. *BMC Medical Education, 20*(1), 1–9. https://doi.org/10.1186/s12909-019-1842-1

Otim, M., Al Marzouqi, A. M., Subu, M., Damaj, N., & Al-Harbawi, S. (2021). Prevalence of generalised anxiety disorders among clinical training students at the university of sharjah. *Journal of Multidisciplinary Healthcare*, *14*, 1863–1872. https://doi.org/10.2147/JMDH.S317828

Patel, M. P. (2014). A study to assess the effectiveness of progressive muscle relaxation therapy on stress among staff nurses working in selected hospitals at Vadodara city. *IOSR Journal of Nursing and Health Science*, *3*(3), 34–59. https://doi.org/10.9790/1959-03323459

Ramasamy, S., Panneerselvam, S., Govindharaj, P., Kumar, A., & Nayak, R. (2018). Progressive muscle relaxation technique on anxiety and depression among persons affected by leprosy. *Journal of Exercise Rehabilitation*, *14*(3), 375–381. https://doi.org/10.12965/jer.1836158.079

Robinson, O. J., Vytal, K., Cornwell, B. R., & Grillon, C. (2013). The impact of anxiety upon cognition: Perspectives from human threat of shock studies. *Frontiers in Human Neuroscience*, *7*, 203. https://doi.org/10.3389/fnhum.2013.00203.2373027923730279

Shaban, I. A., Khater, W. A., & Akhu-Zaheya, L. M. (2012). Undergraduate nursing students' stress sources and coping behaviours during their initial period of clinical training: A Jordanian perspective. *Nurse Education in Practice*, *12*(4), 204–209. https://doi.org/10.1016/j.nepr.2012.01.005

Shen, J., Yu, H., Zhang, Y., & Jiang, A. (2015). Professional quality of life: A cross-sectional survey among Chinese clinical nurses. *Nursing & Health Sciences*, *17*(4), 507–515. https://doi.org/10.1111/nhs.12228

Speedie, L., & Middleton, A. (2021). *Wong's nursing care of infants and children Australia and New Zealand edition-E-book: For professionals*. Elsevier Health Sciences.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *State-trait anxiety inventory (form Y)*. Mind Garden. 77.

Thomas, J., Jack, B. A., & Jinks, A. M. (2012). Resilience to care: A systematic review and meta-synthesis of the qualitative literature concerning the experiences of student nurses in adult hospital settings in the UK. *Nurse Education Today*, *32*(6), 657–664. https://doi.org/10.1016/j.nedt.2011.09.005

Yoshioka, E., Takeuchi, S., & Kaneko, S. (2021). The relationship of stressors for nursing students in practical training of pediatric nursing with their stress-coping ability and stress-coping behavior. *Creative Education*, *12*(1), 151–165. https://doi.org/10.4236/ce.2021.121011

Zargarzadeh, M., & Shirazi, M. (2014). The effect of progressive muscle relaxation method on test anxiety in nursing students. *Iranian Journal of Nursing and Midwifery Research*, *19*(6), 607.2555825825558258