**Situational and trait anxiety among nursing students compared to students studying nursing and paramedics ( double eligibility)**

**Introduction**

Anxiety is a broad term which include emotional and mental experience. Ferud was the first who recognize the anxiety is one of the personality components (Freud, 1936). At the experience level, everyone describes the anxiety differently. In clinical perspective anxiety disorder includes a few psychiatric situations such as: generalized anxiety disorder (GAD), panic disorder, social anxiety disorder, agoraphobia, other phobias, separation anxiety, selective mutism (Beck et al. 1988).  In daily use the term anxiety can describe symptoms of anxiety disorder, but the term is used for description of transient sensations of restlessness, nervousness, worry and dread (Nezlek 2002).

Spielberger (1983) and Endler & Kocovski (2001) defined two kinds of categories of anxiety: Trait anxiety – anxiety that is a part of the personality human, not only in mentally stressful situations. Humans experience sometimes stages of anxiety and its natural react to fears or/and threat. Situational/state anxiety- A natural human response of fear in the face of danger that to experience it does not require the existence of anxiety as health condition (Raffety et al. 1997).

Anxiety is an indistinct sensation that is experienced when an individual is faced with long-term or excessive stress (Lazarus ,1984). Anxiety disorders are among the most common psychiatric disorders. In response to anticipated events or circumstances perceived as threatening, it involves complex cognitive, emotional, physiological, and behavioral responses (Chand et al. 2022). Depressive disorders are characterized by a low mood, a lack of interest or pleasure, fatigue, guilt, sleep disturbances, and difficulty concentrating.

Studies suggested that high levels of trait anxiety were significantly risk factor the significant for depression (Kendler et al. 2004; Wegner and Sandi 2018; Wang et al. 2019). There is consensus in the literature that health professionals are at risk of high stress, anxiety, depression, sleep disorders, burnout, and post-traumatic stress disorder (El Haga et al. 2020; Tselebis et al. 2020; Batra et al.2020; Muller et al.2020; Lai et al.2020).  The issue of situational anxiety in nurses has been studied in the past, in the literature it mentioned that there was a moderate level of situational anxiety among nurses. According to the literature, nurses experience moderate levels of situational anxiety. Regardless of the type of ward, nursing care causes anxiety and needs more attention (Ghods et al. 2017). There is an increase in stress during nursing school. Aside from work and family stressors, students in nursing programs face high levels of anxiety and stress due to the concurrent study of both didactic and clinical coursework (Chernomas and Shapiro 2013; Crary 2013). In the course of their job, nurses often experience pain, suffering, and events that result in patient death. It is part of their job description. Due to this, inappropriate emotional responses may occur, including stress, anxiety, and depression. These are recognized as essential elements of contemporary nursing and can have serious consequences both nurses and patients​ (Jannati et al. 2011; Papathanasiou et al. 2015).

In the literature among paramedic’s anxiety trait or state there are less studies than nurses. Although it is important to note that the subject has been studied intensively over the past two decades. The fact that paramedics experience significant chronic tension suggests that they use psychological mechanisms to reduce elevated stress. Ego defence mechanisms, defined as intrapsychic coping mechanisms that function to maintain anxiety within manageable limits, should provide significant insights into the unconscious ways paramedics manage stress. Also, defence mechanisms can provide insight into an individual's psychological adjustment as a whole (Weinberger 1996). LeBlank et al. (2005) found that paramedics when they are working in stressful conditions such as an essential injection quickly for the patient shows higher level of anxiety. While the EMS (Emergency medical services, paramedics) provider's work environment contains many stressors and uncertainties, they were no more anxious than those in general. Anxiety levels appeared to be affected by years of experience and advanced training. During a shift, violent encounters did not appear to affect anxiety levels. The anxiety levels of providers who worked 12-hour shifts versus 24-hour shifts did not differ significantly. Changes in shift schedules may have other benefits, but they do not appear to reduce anxiety levels in EMS providers significantly (Mock et al. 1999). There is a significant increase in anxiety, depression, and post-traumatic stress disorder (PTSD) among paramedics in Australia compared to the general population (Wolf and Rosenstock, 2017).

Factors associated with anxiety, depression, burnout, and PTSD in paramedics include organisational and operational stressors, fatigue, sleep quality, chronic pain, physical activity, and social support (Clohessy and Ehlers, 1999; Courtney et al., 2010; Courtney et al., 2013; Donnelly, 2012; Donnelly et al., 2016; Donnelly et al., 2014; Rahimi et al., 2015; Wild et al., 2016).

A study in the United States of America found that 44.5% of their EMT (Emergency Medical Technicians participants) had severe mental and physical fatigue (Patterson et al., 2010). In their investigation of fatigue and mental health, Courtney et al. (2010) and Courtney et al. (2013) found significant correlations between fatigue and anxiety and depression in paramedics working in metropolitan and rural areas of Victoria. Interestingly, Sofianopoulos et al. (2011) found no significant correlation between fatigue and depression, however, their paramedic cohort was sampled from a conference which may bias the sample toward a healthier population.

Nurses and Paramedics during the fulfillment of tasks in their work experience of certain levels of anxiety (Robinson 1990; Chiou et al 2022).

The aims of this study are:

1. To find the rate of trait anxiety and state anxiety in nurses and in paramedics

2. To find if there are any differences between nurses vs. paramedics in trait anxiety and state anxiety

3. To find if there is any correlation between trait anxiety and state anxiety in nurses and in paramedics

4. To suggest innervation according to the findings and the literature

**Methods**

This study employed a prospective, comparative longitudinal design with cluster distribution. Two groups of nursing students were examined: one group included students studying nursing only, while the other consisted of students enrolled in a dual study program for nursing and paramedics. The study aimed to investigate situational anxiety (assessed using the Spielberger State Anxiety Inventory), trait anxiety, and knowledge levels among these groups.

The research population included 100 third- and fourth-year nursing students (N=100) from nursing schools and training institutions. Of these, 50 students were enrolled in the nursing-only program, and 50 students participated in the combined nursing and paramedic program. Nursing students with prior paramedic training were excluded from both the study and control groups.

Data collection involved administering a sociodemographic questionnaire, the Spielberger State-Trait Anxiety Inventory (to assess situational and trait anxiety), and documentation of participants’ general and clinical academic scores. Questionnaires were distributed after obtaining approval from the ethics committee, prior to the students' entry into their clinical experiences in the third or fourth year (after completing at least one clinical experience).

The study excluded nursing students who had prior paramedic training to maintain homogeneity in the research groups and ensure valid comparisons between the two programs.

**Statistical methods** צריך להוסיף הסבר על הכלים והציונים

For all qualitative variables, percentages were calculated, and Chi-square tests were performed (with Yates correction for two-on-two tables). Mean and standard deviation were calculated for all quantitative variables, and t-tests were conducted to test the research hypotheses.

All hypotheses were put to a one-sided test. Alpha to obtain the researcher's hypothesis α = .05.

The data was entered into Excel software, and the analyses were conducted using SPSS version 21.

**Sample**

The study involved 86 students, 53 (62%) studying nursing and 33 (38%) studying integrated nursing program paramedics. All students were third or fourth-year students.

Table  1: Background

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Group | Nursing | Integrated nursing | P value |
| Kids N (%) | 5 (9) | 2 (6) | .880 |
| Native | 45 (85) | 30 (91) | .632 |
| Other higher education | 4 (8) | 2 (6) | 1.000 |
| Working | 36 (68) | 26 (79) | .398 |
| Works in a health institut | 16 (32) | 19 (68) | .005 |

**Results**

The first research hypothesis that integrated nursing students will show lower situational anxiety than nursing students was confirmed. Situational anxiety among integrated students was 1.22 (±0.29) compared to 1.48 (±0.37) among nursing students, *p*<.001.

The second research hypothesis that integrated nursing students will show lower trait anxiety than nursing students was confirmed. Trait anxiety among integrated students was 1.80 (±0.56) compared to 2.05 (±0.51) among nursing students, *p*=.015.

The third research hypothesis that integrated nursing students will perform better in studying, as expressed in their theoretical and clinical test scores, than nursing students, was confirmed. The theoretical test score among integrated students was 89 (±3.6) compared to 83 (±5.0) among nursing students, *p*<.001. The clinical test score among integrated students was 96 (±3.8) compared to 93 (±5.2) among nursing students, *p*=.011.

The table below shows the averages and standard deviations of the anxieties and the studying test scores.

Table 2: Comparison of anxieties and studying test scores

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Group | Nursing | Integrated nursing | P value |
| Situational anxiety | 1.48 (0.37) | 1.22 (0.29) | <.001 |
| Trait anxiety | 2.05 (0.51) | 1.80 (0.56) | .015 |
| Theoretical test scores | 89 (3.6) | 83 (5.0) | <.001 |
| Clinical test scores | 96 (3.8) | 93 (5.2) | .011 |

המחקר הנוכחי בדק את הקשר והערך הנוסף שניתן בהכשרה כפולה של אחים ואחיות להפחתת חרדה מצבית ותכונתית . הצורך בהכשרה כפולה כפי שניתן לראות בתוצאות המחקר מעלה את ערכם של הלומדים שתי מקצועות אלו באופן מובהק, הן כאחים ואחיות בעלי כשירות גבוהה יותר וכפרמדיקים עם כשירות גבוהה יותר.

המחקר הנוכחי בדק את הקשר של כשירות כפולה הן ברמת הידע, והן ברמת החרדה המצבית והתכונתית.

חרדה תכונתית הינה תכונה מולדת ועל כן אנו משערים כי לא ניתן לשנותה, והיא זו הקשורה לבחירה המקצועית של מועדים למקצועות אלו (מקור).

עם זאת חרדה מצבית מתפתחת לאורך תהליך הלמידה - העיוני, הקליני והניסיון המקצועי. ונמצא כי סטודנטים לאחים ואחיות הלומדים למידה נוספת של פרמדיקים החרדה המצבית שלהם נמוכה יותר מאשר אלו הלומדים רק להיות אחים ואחיות. ניתן לשייך ממצא זה בהתאמה לשני תהליכים משמעותיים, האחד הוא תהליך הלמידה וההכשרה המקצועית, והשני הוא בתכנים ובדרכי למידה.

ביחס לתהליך הלמידה הספירלי וההכשרה המקצועית ניתן לראות כי…

Patricia Benner's "From Novice to Expert" model outlines five stages of nursing proficiency: novice,

advanced beginner, competent, proficient, and expert. This framework emphasizes that nurses develop expertise over time through a combination of educational foundations and diverse clinical experiences (Tanner, 2010)

 Benner's model underscores the importance of varied experiences in accelerating the progression from novice to expert; there is no direct research on the specific impact of dual training as both a nurse and a paramedic on this progression. However, it is reasonable to infer that acquiring competencies in both roles could provide a broader range of clinical exposures, potentially facilitating a more rapid advancement through Benner's stages. This dual expertise may enhance clinical decision-making and adaptability, key components of proficient and expert practice (Yap & Melder, 2018).

Regarding situational and trait anxiety, Benner's model does not explicitly address these aspects. Nonetheless, as nurses advance in proficiency, increased confidence and competence may naturally lead to reduced anxiety in clinical situations. Engaging in diverse and challenging experiences, such as those encountered in dual nurse-paramedic roles, might further bolster resilience and coping mechanisms, thereby mitigating anxiety levels over time. Even so, the connection between training as both a nurse and a paramedic and its impact on situational and trait anxiety, as well as the potential for rapid expertise development, is an intriguing area of research. The Banner Nursing Model, which emphasizes holistic education and practice, may provide a framework for understanding these dynamics.

Research indicates that nursing students experience varying levels of anxiety throughout their educational journey. A study found that early nursing students exhibited higher state and trait anxiety compared to their later counterparts, primarily due to academic pressures  . This anxiety can adversely affect academic performance and clinical outcomes, emphasizing the need for effective coping strategies within nursing education.  ( Wedgeworth, 2013)

Another study highlights that stress and anxiety significantly affect learning, particularly in simulation-based training. It was observed that lower anxiety levels correlate with better performance outcomes during simulations, suggesting that peer support may mitigate anxiety and enhance learning experiences. This finding is crucial for programs that integrate paramedic training with nursing education, as collaborative learning environments could help reduce anxiety levels (Nakayama et al, 2021).

The integration of nursing and paramedic training could lead to several benefits:

Firstly, Enhanced Skill Set: Training in both fields equips students with a diverse skill set that is beneficial in emergency situations, potentially leading to quicker decision-making and improved patient outcomes (Ghods et al, 2017).

Second, Accelerated Expertise Development: The dual training approach may facilitate faster progression to expert status due to the breadth of experience gained across both disciplines. This aligns with the principles of the Banner Nursing Model, which advocates for comprehensive education that prepares students for complex clinical environments.

Combining nursing and paramedic training is limited it could address to situational and trait anxiety through supportive educational practices but also enhance the overall competency of graduates. Future research should further explore the long-term impacts of this dual training on professional development and patient care outcomes.

Also, while direct evidence is limited, integrating dual training as a nurse and paramedic aligns with Benner's emphasis on experiential learning, potentially expediting the journey to expertise and contributing to reduced anxiety through enhanced competence.

כמו כן, השילוב בין כשירות ואסטרטגיות למידה של סיעוד ושל פרמדיקים מגדיל הן את החלק העיוני והן את החלק הסימולטיבי והקליני מה שמרחיב את הידע והמיומנויות ובהכרח מקטין את החרדה המצבית.

The first module, commonly known as "Phase A" - This module mainly focuses on completing the required theoretical material. The paramedic course integrated with nursing studies builds upon the professional knowledge acquired during the first and second years of nursing studies, such as anatomy, physiology, pharmacology, and more. Therefore, this module includes only focused content, such as treatment protocols under paramedic authority and more. Nevertheless, from the beginning of this phase, professional simulations are conducted daily. These simulations take place in simulation rooms, guided by skilled instructors who are experienced paramedics, using simulation equipment such as smart mannequins, medical equipment, and more. During this phase, which lasts about 9 full weeks of study (5 learning days per week), each trainee performs about 1-3 simulations per day.

The second module, "Phase B or Hospital Phase" - As its name suggests, in this phase, students gain experience in various hospital departments. The phase includes performing many clinical hours in the cardiac intensive care unit, emergency rooms, delivery rooms, and operating rooms alongside anesthesiologists. This phase primarily focuses on clinical experience in both medical skills such as IV insertion, ECG performance, delivery assistance, intubation, etc., as well as physical assessment and medical history taking performed in the presence of doctors from various fields. Additionally, during this phase, as in the first module, course participants are required to complete one concentrated simulation day per week, including 3-5 simulations per student in various areas (trauma, respiratory emergencies, cardiac emergencies, general emergencies, pediatric emergencies, and more).

In the final module of the course or "Phase C," the student gains experience in paramedic work in Magen David Adom's intensive care ambulances. During this phase, students are integrated into various MDA districts and work alongside a mentor paramedic in the ambulances themselves. Each group of trainees is assigned a "mentor" who is responsible for them during this phase. One of their duties is conducting a weekly training day, where trainees perform 1-4 simulations under their guidance. Simultaneously, weekly simulation days continue at the nursing school as in the previous phase.

Therefore, a student in the paramedic course performs dozens of simulations under the guidance of an experienced paramedic during their certification period. These simulations, among other things, provide them with the confidence to handle future stress situations

ביחס לתכני הלמידה וגדרכי הלמידה לא נמצא בספרות קשר בין הכשרות של פרמדיקים והפחתה של חרדה מצבית ותכונתית, מתוך הספרות והמציאות בשטח הקשר המשמעותי להפחתת חרדה מצבית הינו באמצעות הסימולציות . מתוך כך חשוב להבין כי  בהכשרת פרמדיקים  הלמידה נוגעת בציר המקצוע - פרקטיקה, עשייה מתוך טיפול. ואילו בהכשרת אחים ואחיות הלמידה מתייחסת גם לציר המקצועי וגם בציר הדמות, במי ובתפקיד המקצועי שעובר הכשרה, ולכן תכנית משולבת של למידה - כשירות כפולה מתייחסת הן לציר המקצועי והן לציר הדמות באופן המדויק בכל אחד מהם ובכך מאפשר ללומדים להיות עם חרדה מצבית נמוכה יותר. ( מקור).

A lower level of situational anxiety in integrated students can be explained by the fact that they are studying many simulations that focus on a wide variety of emergency treatments in their profession, which reduces their anxiety levels during their missions as compared to nursing students.

לאור זאת נראה כאילו הלמידה בציר הדמות אמורה להגדיל את היכולת להתמודד עם חרדה מצבית. אך בפועל, דווקא בגלל העיסוק המשמעותי בהכשרה בתחום המקצוע (באמצעות סימולציות) ולא רק בציר הדמות כמו בקרב הכשרת פרמדיקים משולבת הכשרת אחים ואחיות יחד היא זו שמגדילה את היכולת להתמודד עם חרדה מצבית.

The use of simulations in healthcare education demonstrates a complex relationship with student anxiety, serving both as a means of anxiety reduction and as a valuable teaching tool across multiple disciplines. Turner et al. (2023) demonstrated that gradual exposure to clinical simulations led to a significant decrease in student anxiety levels over time. This finding is strengthened by a longitudinal study conducted by Zhang et al. (2022), which found that students who participated in a structured simulation program reported a 45% reduction in their anxiety levels compared to the control group. Moreover, Gore et al. (2014) identified that the combination of immediate feedback and repeated practice in a simulation environment not only reduced anxiety but also improved students' self-confidence and their ability to cope with clinical stress situations. Yap et al. (2022) present a nuanced perspective, suggesting that simulation-induced anxiety, when properly managed, can be strategically utilized by instructors as a teaching tool. Their research demonstrates that controlled exposure to anxiety-producing situations during simulations helps students develop professional coping mechanisms and resilience. These findings extend beyond nursing education, as demonstrated by Kreuger et al. (2021) in their study of paramedic training, which showed that high-fidelity simulations produced similar anxiety-reduction benefits and improved clinical performance among paramedic students. Their research particularly emphasized how simulation-based training helped paramedic students develop crucial stress management skills essential for emergency response scenarios, suggesting that the anxiety-management benefits of simulation-based education are applicable across various healthcare disciplines

מגבלות המחקר:

1. כמות הלומדים בכל תכנית לימודים אינה רבה ומתוך כך הקטינה את המדגם במחקר הנוכחי. לאור זאת המדגם הקטן לא צמצם את ה"רעשים" הביולוגיים שמתמעטים במדגמים גדולים.
2. המדגם כלל סטודנטים לסיעוד לעומת אלו הלומדים סיעוד ופרמדיקים ביחד, מאידך לא נבדק בהשוואה לסטודנטים הלומדים פרמדיקים בלבד (לא אושר באמצעות ועדה אתית לבצע זאת).
3. כמו כן, נכון יהיה לבחון ולבצע השוואה בקרב אחים ואחיות לעומת פרמדיקים. אנחנו בחנו רק סטודנטים הלומדים מקצועות אלו ולא אנשי בעלי ותק מקצועי. ניתן יהיה לחשוב כי לאורך הניסיון והעשייה המקצועית פערים אלו של חרדה מצבית יצטמצמו.

מסקנות והמלצות:

1. העובדה כי נמצא שכשירות כפולה של סיעוד ופרמדיקים מפחיתה חרדה מצבית ותכונתית ומגדילה את הידע יש להרחיב שיטת כשירות זו כחלק מהעשייה והסמכויות שיש לאחיות. ואולי אף להוביל כחלק מתהליך ההתקדמות של לומדים אלו תארים ואקדמיזציה שמעלה את כשירותם ומפחיתה חרדה מצבית.
2. כפי שנמצא כשירות כפולה מפחיתה את החרדה התכונתית והמצבית, וככל הנראה מי שלומד כשירות זו הינו בעל חרדה תכונתית נמוכה. לכן המלצתנו היא לבחון את רמות החרדה התכונתית טרם ההכשרה. כדי לבחון התאמה מקצועית ויתר על כן לגבש במהלך הכשירות בביצוע סימולציות אשר יקטינו את החרדה המצבית. וזה גם יתן מענה לבחינה האם כשירות זו מפחיתה את החרדה המצבית.
3. יש צורך במחקר המשכי אשר יבחן את החרדה המצבית והתכונתית טרם ההכשרה ולאחריה, ואחרי מספר שנות ותק כדי להבין באופן מדויק יותר הן את הערך הנוסף והמשמעותי שיש בכשירות כפולה זו של סיעוד ופרמדיקים, וכשירות כפולה בכלל.
4. מחקר זה יכול להוביל למחקרים נוספים אשר יכולים לדייק את תהליכי הכשירות של הלומדים ביחס להכשרה עיוני, קליני וסימולטיבי. העובדה שכשירות כפולה מתאפשרת מתוך תהליכי הלמידה של כל מקצוע ובשילוב יחדיו יכול לדייק גם את תהליכי הלמידה העיוני קליני סימולטיבי של מקצוע האחיות, לא רק בעבור ציר המקצוע - ידע ומיומנויות אלא גם בציר הדמות - חרדה מצבית.