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EXPLORAÇÃO DE ESTRATÉGIAS PARA REDUZIR O STRESS DOS ESTUDANTES NO ENSINO CLÍNICO DE ENFERMAGEM: UM ESTUDO DE MÉTODOS MISTOS

EXPLORING STRATEGIES TO REDUCE STUDENT STRESS IN CLINICAL NURSING TEACHING: A MIXED METHODS STUDY

EXPLORACIÓN DE ESTRATEGIAS PARA REDUCIR EL ESTRÉS DE LOS ESTUDIANTES EN LA ENSEÑANZA CLÍNICA DE ENFERMERÍA: UN ESTUDIO DE MÉTODOS MIXTOS

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RESUMO

Introdução: O ensino clínico (EC) é um período exigente na formação em enfermagem, expondo estudantes a stressores académicos, emocionais e relacionais que podem comprometer a aprendizagem, o bem-estar e o desenvolvimento profissional. Identificar recursos pessoais e estratégias de coping associadas a melhor adaptação é crucial para conceber intervenções eficazes.
Objetivo: Delinear estratégias que melhorem a gestão do stresse de estudantes de enfermagem em EC e promovam o seu desenvolvimento pessoal e profissional.
Métodos: Estudo piloto de investigação-ação, metodologia mista, ancorado no Modelo de Sistemas de Betty Neuman, com estudantes de uma escola portuguesa. Cinco etapas: oficina de gestão do stresse (n=11); coping (n=245); autoconceito e habilidades sociais (n=256); estilos de vida, autoestima e bem-estar (n=424); e grupo focal (n=10) para recomendações.
Resultados: A oficina identificou indutores de stresse e inibidores da aprendizagem, incluindo baixo autoconceito, défices de habilidades sociais e coping inadequado. Os questionários mostraram menor stresse associado a suporte social, resolução planeada de problemas e reavaliação positiva. Menor stresse e maior satisfação relacionaram-se com autoestima, bem-estar e estilos de vida saudáveis. O grupo focal aprofundou stressores e propôs intervenções para o desenvolvimento pessoal e profissional.
Conclusão: O envolvimento de estudantes em EC permitiu compreender stressores, coping e recursos pessoais, salientando o contributo das competências relacionais e comunicacionais. As estratégias incluem promoção de estilos de vida saudáveis, gestão do tempo, reforço da autoestima e melhoria da supervisão, com enfoque lúdico-pedagógico.

Palavras-chave: estudantes de enfermagem; estágio clínico; stress psicológico; modelo Betty Neuman

ABSTRACT

Introduction: Clinical education (CE) is a demanding period in nursing training, exposing students to academic, emotional, and relational stressors that may compromise learning, well-being, and professional development. Identifying personal resources and coping strategies associated with better adjustment is crucial for designing effective educational interventions.
Objective: To outline strategies that improve nursing students' stress management during CE and promote their personal and professional development.
Methods: Pilot action-research study with a mixed-methods design, grounded in Betty Neuman's Systems Model, involving students from a Portuguese nursing school. Five stages were conducted: stress management workshop (n=11); coping assessment (n=245); self-concept and social skills (n=256); lifestyles, self-esteem, and well-being (n=424); and a focus group (n=10) to generate recommendations.
Results: The workshop identified stress triggers and learning inhibitors, including low self-concept, social skills deficits, and inadequate coping. Questionnaire data showed lower stress levels associated with social support coping, planned problem solving, and positive reappraisal. Lower stress and higher satisfaction were related to higher self-esteem, well-being, and healthier lifestyles. The focus group further explored stressors and learning inhibitors and proposed interventions to foster personal and professional development.
Conclusion: Engaging students in CE enabled a better understanding of stressors, coping, and personal resources, highlighting the contribution of relational and communication competencies to stress management. Proposed strategies include promoting healthy lifestyles, time management, self-esteem enhancement, and improved supervision, using a playful pedagogical approach.

Keywords: nursing students; clinical teaching; psychological stress; Betty Neuman model

RESUMEN

Introducción: La enseñanza clínica (EC) es un periodo exigente en la formación en enfermería, que expone al estudiantado a estresores académicos, emocionales y relacionales que pueden comprometer el aprendizaje, el bienestar y el desarrollo profesional. Identificar recursos personales y estrategias de afrontamiento asociadas a una mejor adaptación es crucial para diseñar intervenciones formativas eficaces.
Objetivo: Delinear estrategias que mejoren la gestión del estrés del estudiantado de enfermería durante la EC y promuevan su desarrollo personal y profesional.
Métodos: Estudio piloto de investigación-acción con diseño de métodos mixtos, fundamentado en el Modelo de Sistemas de Betty Neuman, con estudiantes de una escuela portuguesa de enfermería. Se desarrollaron cinco etapas: taller de gestión del estrés (n=11); evaluación del afrontamiento (n=245); autoconcepto y habilidades sociales (n=256); estilos de vida, autoestima y bienestar (n=424); y grupo focal (n=10) para generar recomendaciones.
Resultados: El taller identificó desencadenantes del estrés e inhibidores del aprendizaje, incluyendo bajo autoconcepto, déficits de habilidades sociales y afrontamiento inadecuado. Los cuestionarios mostraron menores niveles de estrés asociados al afrontamiento mediante apoyo social, resolución planificada de problemas y reevaluación positiva. Menor estrés y mayor satisfacción se relacionaron con mayor autoestima, bienestar y estilos de vida más saludables. El grupo focal profundizó en estresores e inhibidores del aprendizaje y propuso intervenciones para favorecer el desarrollo personal y profesional.
Conclusión: La implicación del estudiantado en la EC permitió comprender mejor los estresores, el afrontamiento y los recursos personales, destacando la contribución de las competencias relacionales y comunicacionales a la gestión del estrés. Las estrategias propuestas incluyen promover estilos de vida saludables, gestión del tiempo, refuerzo de la autoestima y mejora de la supervisión, con un enfoque lúdico-pedagógico.

Palabras clave: estudiantes de enfermería; enseñanza clínica; estrés psicológico; modelo Betty Neuman

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INTRODUCTION

Nursing education traditionally involves teaching knowledge and developing clinical judgment in physical classrooms, laboratories, and clinical settings to prepare students for practice (Matthes et al, 2022). This training is demanding and multifaceted, and it is in clinical teaching (CT) that students could encounter real health and illness situations. In this context, displaying one's competencies can be potentially stress-inducing (Uysal & Çaliskan, 2022) and have negative impacts, potentially leading to illness and even causing students to abandon their training (Kinchen, Loerzel & Portoghese, 2020). Valosek et al. (2021) state that it can negatively interfere with health, academic development, and consequently have a negative economic impact.

The need for prolonged exposure of nursing students to various clinical situations and interactions with patients, families, and healthcare teams means these students are at a higher risk of experiencing stress compared to other healthcare students (Uysal & Çaliskan, 2022). Difficulties in managing stress in CT can lead to illness and negatively affect the quality of life of students (Hernandez Ortega, González Pascual, & Fernández Araque, 2021). It can also inhibit personal development or lead to dropout from the course and higher education.

The concept of stress has been explained using different models. In the field of Nursing, Betty Neuman developed the systemic model as a tool to integrate knowledge gained from clinical teaching experiences. Neuman & Fawcett (2011, p.31) state it '(...) is a comprehensive guide for nursing practice, research, education, and administration that opens to creative implementation.' For these authors, health is a manifestation of the life energy available to preserve and enhance the integrity of the system, where the flow of energy is continuous between the individual system and the environment. Stability is the balance/harmony that requires an exchange of energy between the system and the environment to effectively manage the presence of stressors. The system is explained by five interacting dimensions (physiological, psychological, sociocultural, developmental, and spiritual), which have different levels of development and a wide range of interaction styles and potential, represented by a set of continuous and intermittent circles. The central circle is the basic structure that encompasses the basic survival factors common to all living beings, as well as the specific elements that make the individual unique. Stressors are defined as stimuli or forces that occur between the internal and external environment, produce tension, and have the potential to cause instability in the system. The flexible line of resistance functions as a protective buffer for the system. It prevents the influence of stressors on the system, functioning like an accordion in that the more it expands, the more protection it provides, and the more it contracts, the less it protects. The lines of resistance help restore balance and protect the basic structure. Its efficiency in resisting and reversing stressor reactions allows the system to recover; however, if it is inefficient, it can lead to exhaustion, illness, or death. The adjustment of the five variables of the individual's system to environmental stressors determines the individual's stability or their usual level of well-being.

This model estimates that coping styles, lifestyles, developmental and spiritual influences, and cultural issues influence the stability and integrity of the system and its ability to sustain itself. The flexible line of defense ideally prevents stressors from reaching the system by blocking or neutralizing them before they reach the normal line of defense. They can have a positive or negative impact depending on the individual's perception and the nature of the encounter with the stressor. These stressors can be intrapersonal (forces from the internal environment, often conditioned responses); interpersonal (forces from the external environment that occur between people, such as those related to communication styles); extra personal (forces from the external environment that occur further from the individual's immediate boundaries) which arise from the individual's living environment or culture (Neuman & Fawcett, 2011). It also provides a typology of intervention centered on primary, secondary, and tertiary prevention. Primary prevention aims to preserve well-being by protecting the normal line of defense or strengthening the flexible line of defense through early identification and reduction of risk factors, as the reaction to stress-inducing situations has not yet occurred. When a reaction has already occurred, actions should be taken (secondary prevention) to protect the basic structure by strengthening the internal lines of resistance or reducing the impact of stressors. In the restoration phase (tertiary prevention), it is important to intervene in strengthening the basic structure and lines of defense to prevent new episodes of reaction (Neuman & Fawcett, 2011).

Nursing students in clinical teaching (NSCTs) face real situations of health, illness, and suffering and must demonstrate pre-professional skills in a context that can be considered stress-inducing (Uysal & Caliskan, 2022). Therefore, higher education institutions in health are increasingly interested in developing resources and tools that improve stress management, promote health and well-being, and support the personal and professional development of students.

The objective of this study is to outline innovative strategies involving nursing students in clinical teaching to improve stress management in clinical teaching (CT) and promote the personal and professional development of undergraduate nursing students.

1. METHODS

A pilot action research study with mixed methods, anchored in Betty Neuman's Model (Neuman & Fawcett, 2011), involving NSCTs from a Portuguese nursing school. The study was conducted in five stages, involving NSCTs to: identify factors and situations that induce stress and inhibit learning; select stress-inducing factors and learning inhibitors in clinical teaching (CT) that may be intervened upon to promote personal and professional development; and propose innovative playful-pedagogical interventions to improve stress management in CT.

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All students in CT from the 3rd and 4th years were included (n=480). Students were mobilized for the stress management workshop (Stage 1) and to take part in the subsequent studies (Stages 2, 3, and 4) by e-mail. A total of 11, 245, 256, and 414 NSCTs participated, respectively. In the focus group (Stage 5), the 10 participants were randomly selected (within each of the two years) from those who had volunteered to continue in the study when they completed the Stage 4 questionnaire (S4). In stages 1 (S1) and 5 (S5), we aim to understand and reflect on stress in CT under real-world conditions, rather than trying to control stress-inducing conditions in CT or eliminate their influence as causal effects. NSCTs who considered themselves to be affected by the problem and who could benefit from the intervention were involved. On the other hand, we assume that context plays a central role in research, namely the social, cultural, economic, political, legal, and physical environment, as well as the institutional environment, which encompasses various stakeholders and their interactions. The study was sponsored by the school's administration and approved by the ethics committee (ACE 14/2017), adhering to all the precepts of research involving human subjects, including obtaining informed consent at all stages.

Stage 1 (S1). A stress management workshop was held with 11 students. A total of 26 people signed up, and 15 voluntarily dropped out after the 2nd session, due to scheduling conflicts and reporting low levels of stress in CT. The main reasons given for enrolling in the program were: acquiring anxiety control strategies (n=9); struggling with the transition to clinical teaching (n=1); wanting to learn time management (n=1). In the workshop, the group intervention program for stress management (GAP-SASUC, 2008) was implemented, with activities conducted over 10 weekly sessions, each lasting 2 hours in the late afternoon. The sessions included active exploration of the following topics: Self- and peer-introduction and data collection; Understanding and dealing with stress; Stress and the body; Self-control; Managing negative automatic thoughts, Personal agenda management; Communication and conflict management; Stress and anxiety related to exams; Stress management and control techniques; and, in the final session, program evaluation and post-intervention data collection. Quantitative evaluation was conducted using an initial and a final questionnaire. The initial questionnaire assessed: personal aspects; Ways of Coping Questionnaire (Pais Ribeiro & Santos, 2001); Scale of Stress-Inducing Situations in Clinical Nursing Education (Custódio, 2010); and Zung's State Anxiety Scale (Ponciano, Serra & Relvas, 1982). The final questionnaire included an evaluation of personal development perception (GAP-SASUC, 2008); Global Program Evaluation (GAP- SASUC, 2008), and Zung's State Anxiety Scale (Ponciano, Serra & Relvas, 1982). Qualitative evaluation was conducted through structured observation, supported by field notes. As this stage required repeated measures, participants identified themselves with a code when completing the questionnaires, which allowed for pairing pre- and post-intervention measurements.

Stages 2, 3, and 4 (S2, S3, S4). Quantitative questionnaires were administered online to evaluate different conditions in stress management: stress-inducing situations in CT (S2, S3; Custódio, 2010); coping strategies (S2; Pais Ribeiro& Santos, 2001), involving 245 students; self-concept and interpersonal relationship skills in stress management (S3; Vaz Serra, 1986; Del Prette et al, 2004; involving 256 students; lifestyle, self-esteem, and well-being (S4; Silva, Brito & Amado, 2014), involving 414 students.

Stage 5 (S5). Focus group with 10 students (five from the 3rd year and five from the 4th year) to reflect on the results of the previous stages and establish recommendations for improving stress management in nursing CT. The qualitative evaluation was conducted through structured observation, supported by field notes and audio recording.

Data analysis procedure. The qualitative and quantitative data were organized to be interpreted in the light of Betty Neuman's model (Figure 1). The use of this conceptual model aims to identify stressors, plan, and implement interventions to restore balance in the target individuals. In this case, it focuses on overcoming difficulties that inhibit learning in clinical teaching, re-enrollment, or changing courses in the event of failure or dropping out. For the qualitative data, content analysis was conducted, with the aim of making inferences by objectively identifying the characteristics of the messages in order to classify them into themes or categories that help to understand the discourse. The content analysis was carried out in 3 sequential stages: pre-analysis, exploration of the material, treatment of the results, inference, and interpretation. The quantitative data were entered into a database in the Statistical Package for Social Sciences (SPSS), and measures of dispersion and central tendency were calculated. Parametric and non-parametric statistical tests were performed, depending on the normality of the data. For the scales, reliability was estimated using Cronbach's alpha.

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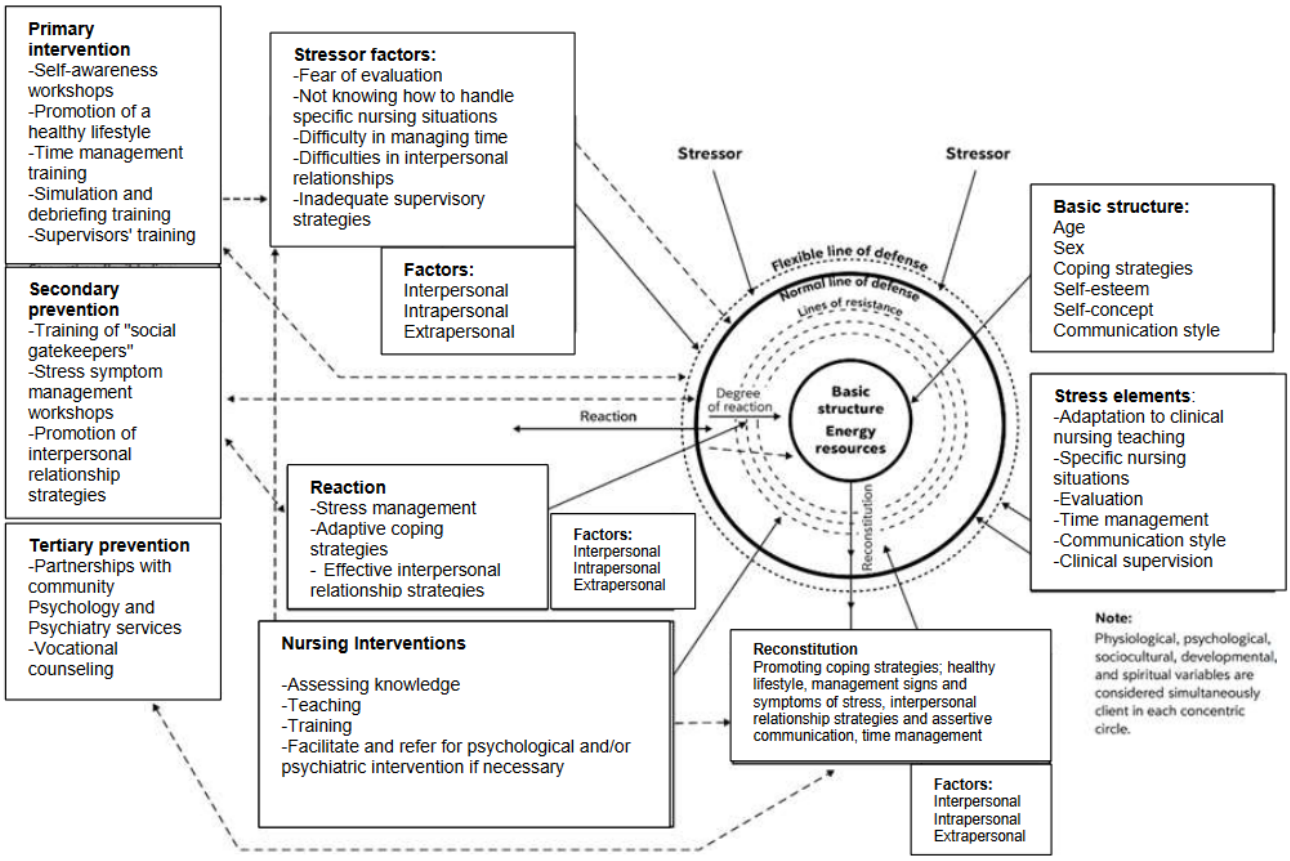

Figure 1- Adaptation of Betty Neuman's model by the authors

2. RESULTS

Organizing the data from the 4 stages of the study (S1 to S4) according to Betty Neuman's model, the different samples are first presented according to their basic structure and lines of defense: gender, age (year of study), coping, self-concept, self-esteem, and social skills. Then, the analysis of the stressful elements is presented below, considering stress-inducing situations in CT and clinical supervision (process, relationship, and strategies). Regarding stressful elements, time management, communication, and interaction were considered. Regarding the reaction to stress, we analyzed lifestyles and socio-emotional skills. In these dimensions, the data were broken down by gender and year of study to try to explain the influence of personal aspects (basic structure). These data provided the basis for the focus group (S5), where proposals for intervention were identified, including for restoration, i.e., strengthening the basic structure and lines of defense to prevent new sources of reaction.

Basic structure and lines of defense. From S1, consisting of 1 male student and 10 female students, aged between 20 and 22 years and mostly in their 3rd year of CT, the data showed the use of coping strategies including emotional social support, positive reinterpretation, emotion-focused strategies, and planning. Denial, behavioral disengagement, and the use of alcohol or drugs were the least used strategies (Table 1). The data also revealed a low self-concept characterized by a negative or depreciative view of oneself (feelings of incompetence; tendency to be excessively self-critical, intense and negative reaction to criticism, tendency to undervalue oneself compared to others, constant fear of failure, constant search for validation, and perfectionism). On the other hand, the data reflected changes in interpersonal relationships (difficulties in initiating interactions, expressing needs and desires, and social isolation).

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Table 1- Summary of the results of the evaluation of coping strategies used by students in stressful situations in clinical teaching (S1)

Coping strategies (each dimension ranges from 4 to 16 points)	Minimum	Maximum	Median
Emotional social support	6.0	14.0	12.0
Positive reinterpretation	7.0	15.0	11.0
Focus on emotions	8.0	16.0	11.0
Planning	4.0	15.0	11.0
Active coping	7.0	15.0	10.0
Coping inhibition	4.0	16.0	10.0
Acceptance	6.0	14.0	10.0
Instrumental social support	6.0	14.0	10.0
Suppression of activities	5.0	12.0	10.0
Mental disengagement	4.0	12.0	9.0
Religious support	4.0	16.0	8.0
Humor	4.0	11.0	8.0
Denial	4.0	10.0	7.0
Behavioral disengagement	4.0	13.0	6.0
Use of alcohol or drugs	4.0	6.0	4.0

In S2, among the 126 students in their 3rd year and 119 in their 4th year, mostly female, it was observed that 4th-year students showed significant differences (p=0.009) in using more problem-focused planning strategies compared to 3rd-year students. In S3, among 141 3rd-year students and 115 4th-year students, no significant differences were found between groups (gender; year of study) regarding self-concept (p=0.391; p=0.794) and social skills (p=0.309; p=0.631). In S4, among 232 3rd-year students and 182 4th-year students, no significant differences were found between groups (gender; year of study) regarding self-esteem (p=0.080; p=0.210).

Stressors and Stressful Elements. In S1, when the 11 students were asked which factors triggered stress, there was a particular emphasis on difficulties in managing time, assessment issues, difficulties in interpersonal relationships, and negative thoughts that reflect their fear of failure. There is an awareness of the difficulties in managing relationships and the supervision process in CT. The quantitative data obtained by applying the scale of Stress-Inducing Situations in CT confirmed the difficulties in managing personal aspects, evaluation, and time and work management. However, the perception of stress related to specific nursing situations and guidance in clinical teaching was also significant. In S2, the stress-inducing situations in CT, analyzed by year of study, were perceived as more stressful by 3rd-year students compared to 4th-year students in the following dimensions: Evaluation (p=0.001), Specific nursing situations (p=0.002), and Personal aspects (p=0.010). In S3, the stress-inducing situations in CT, analyzed by year of study, were perceived as more stressful by 3rd-year students compared to 4th-year students in the following dimensions: Specific nursing situations (p=0.010) and Time management (p=0.035). At this stage, a significant difference was observed in females regarding the perception of stress-inducing situations in CT in the dimension Specific nursing situations (p=0.010).

Reaction. Considering that adaptation to stress-inducing situations depends on the interaction of physiological, psychological, sociocultural, developmental, and spiritual variables, as well as the environment in which they occur, it was observed in S1 that the 11 students recognized which lifestyles they could adopt to improve stress symptoms: nutrition, sleep and rest, avoidance of harmful substances, sharing, and social sharing and interaction. However, 23% of the 11 participants had high levels of anxiety (median of 39 points) at the beginning of the program. After participating in the program, the group's anxiety decreased by 10%, with a median value of 35 points. From the final evaluation of the program's contribution to the participants' personal development, it was observed that there was an increase in the perception of personal development as well as in the level of knowledge of stress management strategies and techniques. However, in terms of personal and interpersonal skills and well-being it was not as significant. In S3, regarding social skills, no differences were found between groups, both by gender (p=0.243) and by year (p=0.433). In S4, we found that lifestyle is positively correlated with self-esteem (r=0.60; p=0.000), with the dimensions 'Sleep/Stress,' 'Work/Personality Type,' and 'Introspection' showing the strongest correlation with self-esteem (r≥0.5; p=0.000). This indicates that students who score higher in lifestyle have higher levels of self-esteem. On the other hand, lifestyle is positively correlated with psychological well-being (r=0.66; p=0.000).

In S5, the focus group, the 10 students were asked to reflect on the data obtained from studies S1 to S4. They pointed to lifestyles (stress management, sleep, and time management), well-being, and self-esteem as buffers, while they considered supervision (process, relationship, and supervisory strategies) as stress-reducing elements. From this reflection, they identified several intervention proposals that should be playful-pedagogical. The recommendations were grouped into these 4 dimensions:

Self-esteem. Valuing cross-cutting skills such as students' personal, emotional, relational, social, and ethical resources.

Well-being. Encouraging leisure time; Teaching and training in emotion management strategies.

Lifestyle. Teaching about sleep and rest and encouraging the implementation of strategies to improve them; Teaching and training in time management strategies; Promoting/encouraging participation in extracurricular activities and/or groups.

Supervision. Optimizing communication strategies (what is said, when it is said, how it is done, who is present, how it is expressed); Setting appropriate and achievable goals within the established clinical teaching time; Managing demands according to each phase

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of clinical teaching; Giving positive feedback and mediating negative feedback; Getting to know the student (personal background, where they live, who they live with, how they commute to clinical teaching, their interests, goals, expectations for clinical teaching, previous and anticipated difficulties, personal problems, etc.); Getting to know the student's educational background (previous clinical training, clinical training in a hospital/community; whether they have any overdue curricular units, etc.); Outlining strategies according to the student's individual needs; Promoting meaningful learning; Encourage the standardization of the supervisory process carried out by both teachers and practicing nurses; Mediating demands according to the objectives of clinical teaching; Perceiving the student throughout their educational journey as a person who is learning and developing, rather than as a professional; Providing support and guidance in emotionally complex situations for the student (e.g.: terminal illness, death, pediatric illness, etc.); Promoting a supervisory relationship characterized by support, assistance, and trust; Establishing an empathetic relationship with the student; Encouraging students to express their opinions; Valuing the student's opinion; Listening to the student.

These recommendations reflect the students' perception of the need to introduce strategies at various levels of prevention, including restoration, i.e., strengthening the basic structure and lines of defense (coping, self-concept, self-esteem, and social skills), to prevent new sources of reaction.

3. DISCUSSION

This mixed-method study outlines innovative strategies that improve stress management of nursing students in clinical teaching (CT) and promote their personal and professional development. First, identify factors and situations that induce stress and inhibit learning among nursing students in clinical teaching: low self-concept and social skills, non-facilitating coping strategies, particularly in evaluation situations and while providing care under the observation of tutors and others. The program used had a very formal structure, which made it difficult to manage schedules and possibly led most of the initial participants to drop out.

Nursing students frequently encounter anxiety and stress during their initial clinical training and practice (Ahmed et al, 2023). This stress can lead to various negative outcomes, including poor academic performance, increased burnout, and reduced personal well-being (Hernandez Ortega, González Pascual, & Fernández Araque, 2021). These issues hinder the primary goal of training, which is to prepare competent nurses (Ahmed et al, 2023).

The data from this study indicate that nursing students perceive physical, cognitive, and behavioral signs of stress that negatively interfere with their health, well-being, and academic performance. These reactions are confirmed by Valosek et al (2021). The quantitative data showed lower levels of stress associated with strategies such as seeking social support, planned problem-solving, and positive reevaluation of the problem. Lower stress levels were associated with better self-esteem, greater well-being, and a healthy lifestyle. In the focus group, stress-inducing factors and inhibitors of learning among NSCTs were identified, which may be intervened upon to promote personal and professional development.

In the discussions and reflection exercises (S1), difficulties in interpersonal relationships emerged at various points, appearing to be one of the areas in need of intervention. The students also identified internal sources of stress as personal aspects, often expressed as negative thoughts. As for external sources of stress, there is agreement between the discussions and the data obtained from the scale for evaluating stress-inducing situations in clinical teaching: evaluation and time/work management. These findings corroborate several studies (Custódio, 2010; Li et al, 2024; Dias et al, 2024; Cruz dos Santos et al, 2022) in which evaluation, personal aspects, time management, and guidance in clinical teaching emerge as stressors. The students recognize the importance of social support; however, it doesn't seem to be identified as a buffer against the imbalances caused by stress-inducing situations. Regarding coping strategies, the data indicate a preference for using emotional social support, positive reinterpretation, and planning in stress management. They also use other, less efficient strategies (emotion-focused coping, behavioral disengagement, and suppression of activities). However, signs of stress and anxiety levels show that these strategies do not contribute to reducing stress in clinical teaching. On the other hand, personal aspects emerge as obstacles to restoring the normal line of defense, increasing the risk of illness, failure, or switching to another course. It should be noted that the subgroups that took part in the study indicated that, in terms of basic structure and lines of defense, there is no difference between being male or female or being in the 3rd or 4th year of the course, except for the coping strategies employed, which are more adaptive among 4th-year students. However, it was observed that lifestyle is positively correlated with self-esteem ($r=0.60$, $p=0.000$), and the results also indicate that students who score higher in lifestyle exhibit higher levels of psychological well-being.

Personal aspects, such as lack of self-confidence/insecurity; fear of making mistakes; feeling observed; having limited technical skills; lack of technical knowledge; inexperience) were identified as major stress-inducing factors and inhibitors of learning among NSCTs, which may be intervened upon to promote personal and professional development. This points to the need to design personal development strategies that will surely impact their learning in clinical teaching and consequently on their professional development. Melo et al (2021) in a study with students on the relationship between academic performance and self-concept and self-efficacy, concluded that these constructs act as protective factors, help in dealing with challenging situations, and facilitate new adjustments and adaptation. If we consider that self-concept is built through interactions, and that significant experiences can contribute to its change (Harris, 2020), we can understand the importance of interpersonal relationship skills and supervisory strategies in the development of one's self-concept both as a person and as a future professional.

This information led to the formation of a focus group (S5), which facilitated reflection to guide the planning and implementation of support for students struggling to manage stress in clinical teaching. It is known that the way each individual handles stress

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depends on multiple factors, including sociodemographic characteristics, the perception and availability of social support, and the coping strategies employed by the individual. Since stress-inducing situations in clinical teaching can have either a positive or negative impact, depending on the individual's perception and the nature of the encounter with the stressor, if the process is non-adaptive, the impact may be illness, failure, or abandonment of the clinical teaching/course.

Stress management programs can prevent damage to the basic structure and lines of defense and resistance (buffers), thereby improving students' skills, i.e., their personal and professional development. From the final evaluation of the program's contribution to the participants' personal development (Table 2), it was observed that there was an increase in the perception of personal development after their participation, as well as in the level of knowledge of stress management strategies and techniques. However, in terms of personal and interpersonal skills and well-being, it was not as significant. It should be noted that the students, in the reflection discussions (S1 and S5), identify a healthy lifestyle as a buffer against the difficulties they experience.

Table 2- Perception of personal development before and after participating in the program

	N	At the start of the program				At the end of the program			
		Minim	Maxim	Mean	SD	Minim	Maxim	Mean	SD
My personal development/growth	11	2	4	3.0	0.8	3	5	3.9	0.7
The level of knowledge of the strategies	11	1	3	2.2	0.6	3	4	3.8	0.4
My knowledge about the techniques that were developed	11	1	3	1.9	0.7	3	4	3.6	0.5
My self-knowledge	11	1	4	2.6	0.9	3	4	3.5	0.5
The level of interaction among the members who participated in the group	11	1	4	3.0	0.8	3	4	3.5	0.5
The level of my personal skills	11	2	4	2.9	0.7	3	4	3.4	0.5
The level of my interpersonal skills	11	2	4	2.6	0.7	3	4	3.3	0.5
My well-being	11	2	4	2.9	0.5	3	4	3.2	0.4

This study also shows that becoming aware of each person's basic resources, as well as the stress-inducing factors and their impact on individual health and learning (reaction), is an intervention that reduces anxiety and promotes personal and professional development. The data from this study will allow for a deeper exploration of the topic and support the design of an educational program that promotes personal and professional development for nursing students. However, the fact that the study involved multiple samples provides potential to draw inferences about the relationship identified here and points to a better understanding of the issue, enabling the development of strategies (resources and tools) for stress management and personal development that promote the health and well-being of students (Şişman, Karaca, Cangür, 2020).

Such evidence supports the thesis that promoting a healthy lifestyle should be an institutional investment, as advocated by the movement of health-promoting universities (Silva, Brito & Amado, 2014). The author proposes strategies for self-reflection on lifestyle that generate processes for finding resources to better manage academic life. She also advocates that these reflection processes need to be mediated by playful-pedagogical activities and peer education to engage more students. Therefore, encouraging the co-creation of playful-pedagogical strategies to reduce the stress among students in clinical nursing teaching. For example, the game 'Dado à fala'© is currently under development to encourage CT supervisors and NSCTs to express the difficulties experienced in this teaching-learning context by gamification. Silva et al (2023) highlight the urgent need to establish, within the nursing curricula, clinical supervision strategies that promote critical thinking and skills development for clinical judgment, problem solving, and safe, effective, and ethical decision-making.

Recent evidence suggests strategies to manage stress among students in CT: communication skills training combined with emotional support and mentoring (Mashalchi et al, 2021); Teaching time management techniques can help students balance their academic and clinical responsibilities, reducing overload (Ghasemi, Moonaghi, & Heydari, 2020); and creating a collaborative and supportive learning environment where students feel safe to express their concerns and challenges (Zhang et al, 2022).

CONCLUSION

This study provides contributions to an intervention model that improves stress management and promotes the personal and professional development of nursing students. It is a pilot action research study, anchored in Betty Neuman's model, involving nursing students in CT to understand how they deal with stressors and their association with personal resources and defense and resistance skills, as well as to propose strategies to reduce stress among nursing students in clinical teaching. The data from the first study shows that the way students handle stressors is related to their personal resources, but also to their defense and resistance skills. Relational and communication skills seem to contribute to better management of stress factors. It was observed that at this stage, the students who remained were the more timid and anxious ones, who reported 'freezing' in interpersonal interactions with the supervisor and patients, blaming themselves. These findings led to study two, which identified more adaptive coping strategies among final-year students. In the third stage, it was found that self-concept and interpersonal relationship skills did not significantly correlate with stress-inducing situations in clinical teaching, in the total scores. Next, the correlation between

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lifestyles and stress-inducing situations in clinical teaching was studied, revealing that these stressors, when perceived as such, influenced less healthy lifestyles.

Lastly, the final focus group confirmed these data and indicated that students, depending on the styles of supervision, developed adaptive strategies. At the end, students outline innovative strategies that improve stress management of nursing students in clinical teaching (CT) and promote their personal and professional development. The individual relationship and communication characteristics of nursing students can be enhanced to better manage stress in clinical teaching. On the other hand, the style of supervision in clinical teaching needs to be improved to generate meaningful pedagogical experiences tailored to each student's characteristics. It should also be noted that the practice of the profession relies on communication and relational skills, so the promotion of these skills is crucial.

The following strategies for managing stress among students in CT were proposed: development of time management skills and handling stressful situations in clinical teaching; support in enhancing self-esteem; promotion of a healthy lifestyle. With supervisors, training on supervision strategies in clinical teaching. As the younger generations exhibit greater deficits in communication and relational skills, interventions like this pilot study would be useful early in the course. Evidence suggests some strategies to manage stress among students in CT, like communication skills training combined with emotional support and mentoring, training time management techniques to balance academic and clinical responsibilities, and creating a collaborative and supportive learning environment. Implementing the principles of a health-promoting university would create a salutogenic environment that facilitates greater well-being.

The fact that this is an action research study conducted at only one nursing school leads to expected contextual evidence. Therefore, we suggest replicating the study in other institutions, which may enhance the creativity of NSCTs in proposing additional strategies to reduce stress in clinical nursing teaching.

AUTHORS´ CONTRIBUTION

Conceptualization, M.C., I.B. and A.L.C.; data curation, M.C. and I.B.; formal analysis, M.C. and I.B.; funding acquisition, A.L.C.; investigation, M.C.; methodology, M.C., I.B. and A.L.C.; supervision, I.B. and A.L.C.; visualization, M.C.; writing – original draft, M.C. and I.B.; writing – review & editing, M.C. and I.B.

CONFLICT OF INTERESTS

The authors declare no conflict of interests.

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