Relation between Resilience and Stress as Perceived by Nursing Students: A Scoping Review

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ABSTRACT

Context: Prolonged exposure to stress can lead to psychological distress, emotional exhaustion, burnout, and impaired resilience in nursing students. However, resilience is known to mitigate the detrimental impacts of stress. Resilience plays a significant role in students' academic success and retention in academic nursing programs.

Aim: This review aimed to conduct a scoping review of the literature addressing the relationship between resilience and stress among nursing students.

Methods: A scoping review, based on PRISMA guidelines, of studies of quantitative, qualitative, and mixed-method research designs that focus on resilience and stress relationships among nursing students. The search was conducted using PubMed, CINAHL, EBSCO, ProQuest, and Medline electronic databases, via the Saudi Digital Library. It included studies published during the last six years. For this review, publications about undergraduate nursing students only were considered. All the included studies were critically appraised using the critical appraisal tool.

Results: The screening method yielded 22 studies that met the inclusion criteria and were included in the review. Six main themes have emerged throughout this review which were: Sources of stress, resilience and stress levels among nursing students, the importance of resilience to nursing students, the relationship between stress and resilience, strategies to improve resilience in nursing students, and key variables in understanding resilience among nursing students.

Conclusion: This review synthesized the evidence relating to the relationship between resilience and stress among nursing students. Evidence highlighted the importance of resilience in dealing with nursing students' stressors in their academic and practical life. This review showed that the educational programs that focus on building and enhancing resilience among nursing students were disparate, and they were not of direct and significant impact on improving resilience. Therefore, further research on introducing interventional educational programs that target enhancing resilience among nursing students based on their personality is recommended.

Keywords: Resilience, perceived stress, nursing students

1. Introduction

It is widely acknowledged that nursing education can be a demanding and exhausting experience. University life is generally regarded as a stressful and even traumatic time, during which students encounter new challenges in their academic, social, and personal contexts. However, it is also seen as a favorable developmental factor, as it helps students improve their coping resources and prepare for adulthood *(Onan et al., 2019).*

Due to the severity and demands of the academic environment coupled with family, financial, or other sources of stress, student nurses usually experience high-stress levels. Academic sources of stress include a heavy workload, fear of failure, a competitive environment, and feeling stretched beyond one's capacity *(Reeve et al., 2013).*

However, nursing students in their clinical practice encounter a variety of sources of stress such as incompetency and working with patients in pain or with dying patients, providing intimate care to patients, fear of making mistakes, and having interpersonal conflicts with patients and staff *(Smith & Yang, 2017; Thomas & Revell, 2016).* Furthermore, nursing students experience several personal stressors, including depression, anxiety, a scarcity of time to spend with family and friends *(Pitt et al., 2014).*

Prolonged exposure to stress can lead to psychological distress, emotional exhaustion, burnout, and impaired resilience in nursing students *(Aburn et al., 2016; Sanderson & Brewer, 2017; Stephens, 2013).* However, resilience is known to buffer the negative effects of stress *(Reyes et al., 2015a).*

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In academic nursing programs, resilience has a significant role in students' academic success and retention *(Beauvais et al., 2014)*. Therefore, an emphasis on resilience in nursing education is needed to positively influence the development of mature and confident nursing students who can think analytically and flexibly and engage in self-reflection to handle the stressors in their academic program. Consciously and intentionally focusing on resilience inclusion into the nursing curriculum will greatly help transition to clinical practice as graduate nurses *(Lekan et al., 2018; Reyes et al., 2015b)*.

Hence, this scoping review examined the findings of the previous studies concerning the relationship between resilience and stress among nursing students, published during the last six years (2015-2020)*, to provide a wide representation of research evidence that investigates this relationship within this population.

2. Aim of the study

This review aimed to conduct a scoping review of the literature addressing the relationship between resilience and stress among nursing students.

3. Methods

3.1. Research Question

What is the relationship between stress and resilience among nursing students?

Table 1: PICOT Question

PICOT	CONTENT	PICOT QUESTION
P	Nursing students	What is the
I	Not applicable	relationship between
C	Not applicable	stress and resilience
O	Relationship between stress and resilience among nursing students.	among nursing students?
T	January 2015 to December 2020	
Type	Meaning PICOT question	

3.2. Search strategy

A search of the literature was conducted using several selected databases: PubMed, CINAHL, EBSCO, ProQuest, and Medline using keywords (resilience, resiliency, resilient, stress, perceived stress, undergraduate, baccalaureate, nursing students, student nurse). The keywords used in the search were designed to reflect the subject heading (MeSH) terms, keywords, and phrases from the selected database related to the review research question. The search of keywords was connected using Boolean operators "AND" and "OR" to narrow and expand the search, respectively, for example, "resiliency OR resilient."

The search process followed a specific inclusion criterion: all studies about resilience and stress among nursing students were included. Included studies were qualitative or quantitative, or mixed research designs published in peer-reviewed journals, during the period between January 2015 to December 2020, in English. It is worth mentioning that due to the limited number of studies that include both variables together, the researcher has included the studies that either investigate each variable alone or both of them together.

Moreover, the retrieved studies were screened for eligibility and filtered using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow diagram *(Moher et al., 2009)*. The PRISMA flow diagram contains four phases. Initially, 213 articles were identified. However, 61 articles were eliminated due to duplication. A further 111 articles were removed based on the inclusion and exclusion criteria. The titles, abstracts, and full texts of the remaining articles were screened for eligibility. Nineteen articles were eliminated because they did not match the review inclusion criteria (studies with different populations; not nursing students), leaving a total of 22 articles for inclusion in this review (see figure 1 for details of the study's selection process).

3.3. Critical appraisal

Critical appraisal of the included studies was conducted using the tool established by *Hawker et al. (2002)*; 22 studies that met the criteria for inclusion in the review were assessed independently for their quality. The tool was used to assess many factors: title and abstract, introduction and aim, method and data, sampling, data analysis, ethics and bias, results/findings, transferability, usefulness, and implications *(Hawker et al., 2002)*. The total score is 36 points, with each factor receiving four points ranging from 1 (very poor) to 4 (good quality). The sum of the nine items score gives an overall study quality score. Each study was described as either a poor-quality study when its score ranged from 9-18, a fair quality study if its score ranged from 18-27 and a good quality study if its score was 28-36. By critiquing the studies included in this review, the results showed that all of the assessed studies were deemed to be of good quality (see Table 3).
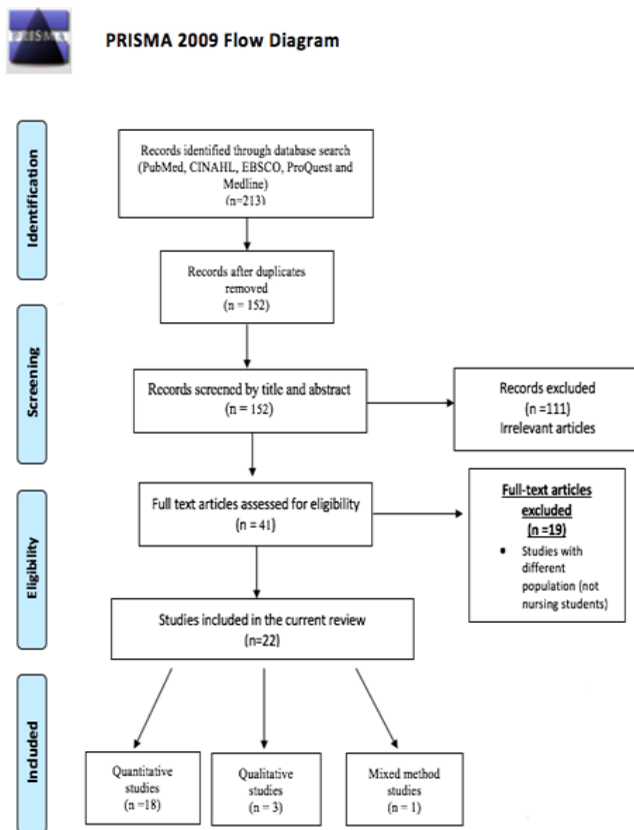
Figure (1): Flow diagram of the approach employed by this review, based on PRISMA guidelines (Moher et al., 2009)

4. Results

The findings were presented as follows: a description of the characteristics of the included studies, then a critical appraisal of the studies, and finally an evaluation of the extracted themes.

The total numbers of included studies were 22. The majority of them were conducted in Asia (n=13), then in Europe (n=5), with a minority of included studies published in North America (n=1), South America (n=1), Australia, and Canada (n=2). The study design of the included studies was 18 quantitative studies, three qualitative studies, and only one study used mixed methods. The sample size varied across the included studies. Seven studies had a relatively large sample (more than 300 students), and 15 studies had samples of less than 300 students. The highest sample size was 1,538 participants, while the lowest was 24.

The study sample for the included studies was nursing students. However, the first-year nursing students were the sample in three studies *(Chow et al., 2020; Oliveira de Souza et al., 2020; Onan et al., 2019),* and the third-year nursing students were the sample in one study *(Chamberlain et al., 2016).* Three studies included first, second, third, and fourth nursing students in their studies *(Mathad et al., 2017; Nebhinani et al., 2020; Smith & Yang, 2017).* One study included first, second, and third nursing students in its samples *(Kupcewicz et al., 2020),* while another study

included third and fourth-year nursing students only *(Hwang & Shin, 2018).* Two studies *(Chow et al., 2018; Sahu et al., 2019)* included undergraduate and postgraduate nursing students (30% of the sample were postgraduate in the first study while only 6% were postgraduate students in the other study). Four studies have undergraduate nursing students without referring to the exact year of study of the included nursing students *(Ozsaban et al., 2019; Sam & Lee, 2020; Van Hoek et al., 2019; Škodová et al., 2018).* Five studies included final year nursing students *(Ching et al., 2020; Liang et al., 2019; Rees et al., 2016; Ríos-Risquez et al., 2016; Stacey et al., 2017).* Two studies included senior nursing students *(Lekan et al., 2018; Wie & Choi, 2020).*

Finally, the tools used by the studies included in the current review varied across the studies. Across the 22 studies, seven scales were used to measure resilience. The Connor-Davidson Resilience Scale (CD-RISC) consisted of 25-items and was used in 2 studies *(Lekan et al., 2018; Sahu et al., 2019),* while the 10-item version of the scale was used in 6 studies *(Chamberlain et al., 2016; Chow et al., 2020; Chow et al., 2018; Mathad et al., 2017; Rees et al., 2016; Ríos-Risquez et al., 2016).* Resilience Scale (RS-25 items), which *Wagnild and Young (1993) developed,* was used in four studies *(Oliveira de Souza et al., 2020; Sam & Lee, 2020; Smith & Yang, 2017; Wie & Choi, 2020).* The Turkish adaptation of the Psychological Resilience Scale for Adults *(Friborg et al., 2003),* consisting of 33 items, was used in 2 studies *(Onan et al., 2019; Ozsaban et al., 2019).*

Four scales: VK+ (Veerkracht); the Dutch Resilience Scale consisted of 25 items developed by *Portzky (2015),* A 13-item version of *Antonovsky's (1993),* Sense of Coherence Questionnaire (SOC), and Baruth Protective Factors Inventory *Baruth and Caroll (2002)* consisted of 16-items, and Academic Resilience Scale which comprised 29 items *(Park & Kim, 2009),* were used in single studies *(Hwang & Shin, 2018; Van Hoek et al., 2019; Škodová & ubica Bánovčinová, 2018).*

However, regarding the tools used to measure stress, the Perceived Stress Scale *(Cohen et al., 1983)* was used in three studies. One of these studies used the 14-item version of the scale, while the others used the 10-item version *(Kupcewicz et al., 2020; Sahu et al., 2019; Sam & Lee, 2020).* Seven scales: Nursing Education Stress Scale consisted of 32-items which was modified and developed by *Rhead (1995)* from the Nurse Stress Scale developed by *Gray-Toft and Anderson (1981),* Stress Scale for Korean Nursing Students consisted of 58 items *(Yoo et al., 2008).* The Stressors in Student Nursing Scale (SINS) consisted of 43 items *(Deary et al., 2003)*, Chinese version *(Watson et al., 2013);* Stress Inventory consisted of 24 items designed by *Beck and Srivastava (1991)* and later revised and supplemented by *Kim and Lee (2005).* The Turkish adaptation of Stress Self-Assessment Checklist consisted of 38 items developed by *DasGupta (1992),* Student Nurse Stress Index (SNSI) consisted of 22 questions developed by *Jones and Johnston (1999),* and the Assessment of Stress in Nursing Students (ASNS) consisted of 30 items was proposed by *Costa and Polak (2009),* were used in single studies *(Hwang & Shin, 2018; Nebhinani et al., 2020; Oliveira de Souza et al., 2020;*

Onan et al., 2019; Ozsaban et al., 2019; Smith & Yang, 2017; Wie & Choi, 2020). One study used group discussion, individual interviews, and reflective diaries in the three qualitative studies, while the other two used focus group interviews *(Ching et al., 2020; Liang et al., 2019; Stacey et al., 2017).* In the mixed-method study, pre-test and post-test questionnaires and focus group interviews were used *(Chow et al., 2020).*

A total of six themes emerged from the review of the included studies, and these included: the different sources of stress, resilience, and stress levels among nursing students, the importance of resilience to nursing students, the relationship between stress and resilience, strategies to improve resilience in nursing students, and key variables in understanding resilience among nursing students (see Table 2).

4.1. The different sources of stress

In the current review, six studies reported different sources of stress classified into three categories: Academic stressors, clinical stressors, and personal stressors. Regarding academic stressors, a cross-sectional study was conducted on a sample of student nurses by *Oliveira de Souza et al. (2020)* to verify the relationship between stress and resilience. They revealed that students had a high-stress level related to time management, theoretical activities, and the environment. Moreover, *Nebhinani et al. (2020)* conducted a study to assess stress and coping strategies of nursing students and found that academic load, lack of free time, and fear of examination were the main sources of perceived stress among nursing students.

Two studies mentioned clinical stressors *(Ching et al., 2020; Nebhinani et al., 2020).* Ching et al. (2020) conducted a qualitative descriptive study to investigate nursing students' stressors and coping mechanisms with various degrees of burnout and resilience throughout their clinical placement. They reported that sources of stress were meeting the nurses' expectations, the diversity of practice among different hospitals, caring for patients with complex care needs. In addition, had difficulty applying what they had learned due to time and resources constraints, clinical assessments, and rejections and criticism by the staff *(Ching et al., 2020). Furthermore, Nebhinani et al. (2020)* revealed that a large number of students reported feeling stressed as a result of other professionals' attitudes toward nursing.

Regarding personal stressors among nursing students, two studies reported these stressors across this review *(Lekan et al., 2018; Onan et al., 2019). Lekan et al.(2018)* conducted a study to explore resilience in senior nursing students and found extreme financial distress (48%) to be the leading cause of stress, followed by death or loss of family members or friends (30%), and marriage or divorce (7%). Also, in a study by *Onan et al. (2019),* they found that 59% of the nursing students had encountered a stressful life event other than starting university. For instance, moving to a new place, changing financial situation, or health problems.

4.2. Resilience and stress levels among nursing students

The current review reported resilience and stress levels in 14 studies. Twelve studies reported the levels of resilience, two studies reported the levels of stress, and five reported the levels of resilience and stress together.

Regarding the level of resilience, a quantitative study aimed to investigate the predictors of nursing students' resilience, including dispositional mindfulness and employment status with high resilience scores *(Chamberlain et al., 2016).* Moreover, several studies reported moderate levels of resilience among nursing students *(Chow et al., 2020; Hwang & Shin, 2018; Mathad et al., 2017; Ozsaban et al., 2019; Ríos-Risquez et al., 2016; Smith & Yang, 2017).*

Furthermore, two cross-sectional studies found few percentages of resilient students in their surveys *(Lekan et al., 2018; Sahu et al., 2019). Lekan et al. (2018)* explored resilience in senior-level nursing students. They found that only 33.3% of the sample was considered resilient. Similarly, *Sahu et al. (2019)* undertook a study to identify the relationship between stress and resilience levels with cell phone usage among students nurses and found that 20.6% of the students had high resilience capacity.

Moreover, a lower resilience level was found in several studies *(Chow et al., 2018; Oliveira de Souza et al., 2020; Sam & Lee, 2020). Chow et al. (2018)* aimed to investigate resilience and well-being relationships among nursing students, revealing relatively low levels of resilience. *Sam and Lee (2020)* aimed to assess nursing students' perceived stress and resilience levels, finding that 55% of nursing students had low resilience. Similarly, *Oliveira de Souza et al. (2020)* conducted a study to identify stress and resilience relationship among students nurses, revealing that they had low resilience levels, followed by moderate resilience levels.

However, regarding the stress level, a high level of stress was found in two studies *(Nebhinani et al., 2020; Smith & Yang, 2017). Smith and Yang (2017)* conducted a study to examine the relationship between stress and resilience. They assessed the stress level among nursing students, reporting a relatively high level of stress. Similarly, in a descriptive study conducted by *Nebhinani et al. (2020),* they found that the overall perceived stress of nursing students was high.

Moreover, two studies have found that the stress levels were moderate to high *(Kupcewicz et al., 2020; Sahu et al., 2019). Sahu et al. (2019)* found that 77.5% of the nursing students had a moderate to high-stress perception. *Kupcewicz et al. (2020)* identified the relationship between stress and coping mechanisms and students nurses' quality of living and health. They reported that most of the students surveyed had moderate or high-stress intensity over the last month.

Furthermore, moderate stress levels have been found in two studies *(Oliveira de Souza et al., 2020; Ozsaban et al., 2019). Oliveira de Souza et al. (2020)* reported a predominance of medium stress levels among student nurses. Similarly, *Ozsaban et al. (2019)* identified the levels of academic stress, resilience, and social support of nursing

students and the relationship between them, showing that the academic stress levels of the students were moderate.

However, low-stress levels were found in a study conducted by *Sam and Lee (2020)* to assess nursing students' perceived stress and resilience levels, showing that 54.3% of them had low stress and 45.7% of them had high stress.

4.3. Importance of resilience to nursing students

In this review, eight studies referred to the importance of resilience in empowering nursing students to deal with challenges during their education program and the nursing profession. *Sam and Lee (2020)* suggested that the inclusion of resilience measures in the nursing students' educational program will give them the needed strength and endurance to face the profession with confidence. Similarly, *Onan et al. (2019); Smith and Yang (2017)* emphasized the potential role of resilience in dealing with the unavoidable sources of stress in nursing students' education.

Moreover, *Ríos-Risquez et al. (2016)* investigated the relationship between nursing students' resilience, academic burnout, and psychological health. The study revealed that students with higher resilience levels were less prone to burnout (i.e., their academic efficacy was higher, and in turn, their emotional exhaustion and cynicism were lower). Furthermore, *Hwang and Shin (2018)* conducted a study to determine the characteristics of students nurses with high academic resilience and found that students with high academic resilience were more satisfied with their major, practice content, and environment. Also, they reported reduced stress from practice-related pressures and fewer problems in interpersonal relationships and with patients *(Hwang & Shin, 2018)*.

The importance of resilience in academic success was mentioned in three studies. *Lekan et al. (2018)* mentioned that focusing on inclusion resilience in the nursing curriculum is necessary to ensure that nursing students are well prepared to succeed academically and transition smoothly into their professional roles. Also, in line with this, *Hwang and Shin (2018)* found that a large proportion of nursing students with high academic resilience levels had high academic grades. In addition, *Van Hoek et al. (2019)* investigated the impact of socio-demographic factors, stress-reducing activities, and resilience on student nurses' academic outcomes. They revealed that resilience was the only factor that greatly impacted students' academic success.

Furthermore, its importance in nursing students retention was mentioned in two studies *(Hwang & Shin, 2018; Van Hoek et al., 2019). Hwang and Shin (2018)* found that students in the high resilience group were more likely to show greater retention (i.e., more likely to continue their studies). In the same line, *Van Hoek et al. (2019)* revealed that only resilience was a significant predictor of nursing students' intention to leave and desire to drop out.

Finally, with regards to the importance of resilience in enhancing psychological health/well-being, it was reported in a study conducted by *Ríos-Risquez et al. (2016)* that students with a higher resilience level had fewer psychological distress symptoms (i.e., better perceived psychological health). Furthermore, *Chow et al. (2018)* found that resilience is an important predictor of perceived well-being in nursing students. Similarly, *Smith and Yang (2017)* reported that resilience level might predict psychological well-being.

4.4. Relationship between stress and resilience

In the current review, the relationship between resilience and stress were reported in seven studies *(Oliveira de Souza et al., 2020; Onan et al., 2019; Ozsaban et al., 2019; Sahu et al., 2019; Sam & Lee, 2020; Smith & Yang, 2017; Wie & Choi, 2020).*

A negative correlation between stress and resilience levels among nursing students was found in five studies. A cross-sectional study undertaken in China by *Smith and Yang (2017)* found that resilience was weakly and negatively correlated with stress, where an increase in resilience score resulted in a decrease in total perceived stress scores. Similarly, several studies have reported a negative correlation between resilience and stress among nursing students *(Onan et al., 2019; Sahu et al., 2019; Sam & Lee, 2020; Wie & Choi, 2020).* However, two studies in this review have revealed no significant correlation between resilience and stress among nursing students *(Oliveira de Souza et al., 2020; Ozsaban et al., 2019).*

4.5. Strategies to improve resilience in nursing students

According to *Onan et al. (2019),* who conducted a study to assess a stress-coping course for resilience among students nurses, they revealed that students experienced a non-significant reduction in the frequency of stress symptoms because of the stress-coping course. In addition, among the subscales of psychological resilience, the course resulted in a substantial increase in self-perception and social sources. As a result, learning to cope with stress may increase psychological resilience.

Moreover, a participatory action research (PAR) approach was used to establish and execute a resilience enhancement (RE) based project for students' nurses during their clinical practice. Mentors in RE used facilitated discussion, coaching, challenging common thinking, and group work to build learning environments that inspire and empower students. Participants were assisted in identifying and setting goals and tracking their progress. As a result, their self-regulation, effectiveness, and resilience improved, and they developed autonomous professional practice skills and response strategies *(Liang et al., 2019).*

Furthermore, *Stacey et al. (2017)* used a case study methodology to assess an intervention that aimed to support pre-registration nursing students to develop resilience-based competencies (RBCS) to regulate their response to stress and monitor their response to stress their well-being using mindfulness, reflective discussion, and positive reframing. During a clinical placement in the final six months of their program, 120 students received resilience-based clinical supervision twice a week. Each two-hour session was led by a nursing professor who had completed a three-day training

course and assisted by compassion-focused therapy practitioners. The Findings showed that engaging in mindfulness-based stress-reduction practices and using positive reframing were linked to increased self-reported resilience.

Also, a mixed-methods study was conducted by *Chow et al. (2020)* to establish a resilience-building module for students nurses and assess its effects on resilience, mindfulness, and well-being. The module consisted of three 90-minute workshops on resilience and emotion regulation, stress management and mindfulness, and burnout and depression. Although the quantitative results showed no substantial changes in outcomes from the pre-test to the post-test, the qualitative results indicated that the inclusion of the resilience-building module in undergraduate nursing curricula might be advantageous. Moreover, the students agreed that the resilience-building module evoked their awareness of resilience and helped them realize its importance in their nursing studies and their future careers.

Likewise, *Rees et al. (2016)* developed courses that targeted building the perceptions of self-efficacy, teaching mindfulness, and adaptive coping skills. The study reported that these courses were likely to help maintain nursing students' resilience throughout their studies. In addition, programs that encourage using coping techniques such as planning, positive reframing, and seeking support would benefit students with high levels of neuroticism the most. These programs are most likely to increase these students' resilience.

Moreover, reinforcement of social-affective capability, including self-recognition, self-management, social recognition, and relationship management, could be used to improve academic resilience *(Hwang & Shin, 2018)*. In line with this, *Ozsaban et al. (2019)* suggested that programs should target increasing the social support available to students, therefore strengthening their resilience. Furthermore, in a study conducted by *Lekan et al. (2018)*, nursing students reported their resilience strategies as follows: working hard, building a "tough skin," reaching out to others in the support system and seeking professional help to deal with anxiety and depression.

4.6. Key variables in understanding resilience among nursing students

In the current review, several variables (leadership roles, previously earned a degree, self-perception, health status, major satisfaction, burnout and compassion fatigue, self-efficacy, empathy, and repetitive negative thinking, mindfulness, social support, and interpersonal relationships, coping, personality, and psychological health/well-being) were found as a key in understanding the resilience among nursing students.

Students in leadership roles may exhibit a higher degree of resilience than other classmates. This factor was only reported in one study by *Smith and Yang (2017)* that found that students in class leaders' roles had a higher mean resilience score (33.9%) than their classmates. Moreover, previously earned a college or university degree as a variable

that might affect resilience was reported in only one study *Lekan et al. (2018)*. *Lekan and colleagues* reported that students with a previously received degree from college or university might be more exposed to a lack of resilience since they are usually older and have more complicated family and career commitments in addition to academic demands.

Furthermore, one study reported self-perception, health status, and major satisfaction as variables affecting resilience (*Wie & Choi 2020*). *Wie and Choi (2020)* reported that self-perception and resilience are positively correlated (i.e., increased self-perception correlates with increased resilience and vice versa). Also, they found that resilience was affected by health status and major satisfaction. However, burnout and compassion fatigue and their relation with resilience were mentioned in a quantitative study conducted by *Chamberlain et al. (2016)* that reported compassion, fatigue, and burnout correlated negatively with resilience and correlated positively with compassion satisfaction.

Self-efficacy as a factor impacting resilience was mentioned in one study *by Rees et al. (2016),* revealing that self-efficacy impacts the overall resilience of nursing students. Also, empathy and repetitive negative thinking and their relation with resilience were mentioned in a study by *Mathad et al. (2017)* that found resilience to be positively correlated with empathy and negatively correlated to repetitive negative thinking subscales.

Moreover, mindfulness was mentioned in three studies as a variable affecting resilience *(Chamberlain et al., 2016; Mathad et al., 2017; Rees et al., 2016). Rees et al. (2016)* found that mindfulness impacts the overall resilience of nursing students. In line with this, *Mathad et al. (2017)* reported that resilience was significantly correlated with mindfulness and regression results revealed that mindfulness alone could explain 23% of the variance in resilience. Also, a study by *Chamberlain et al. (2016)* reported that dispositional mindfulness is the strongest predictor of resilience. This finding is also consistent with *Chow et al. (2020),* who found that dispositional mindfulness was significantly associated with resilience. They identified it as a salient independent predictor of resilience and a crucial skill for improving resilience among nursing students.

Social support and interpersonal relationships were among the variables that affected resilience in four studies (*Hwang & Shin 2018; Lekan et al., 2018; Ozsaban et al., 2019; Wie and Choi, 2020). Ozsaban et al. (2019)* revealed a significant correlation between resilience and perceived social support. Thus, an increase in social support levels may be useful for increasing resilience levels. Following *Lekan et al. (2018)* reported a significant correlation between relationship status "close and secure relationships" and resilience. Thus, highlighting the importance of social support in resilience. Similarly, *Wie and Choi (2020)* found that resilience was affected by interpersonal relationships, and there were significant differences in resilience according to interpersonal relationships. Also, *Hwang and Shin (2018)* reported that a significant percentage of the participants with high academic resilience levels had good interpersonal relations.

Social-affective capability as a protective factor for resilience was mentioned in a study by *Hwang and Shin (2018)*. They found that students with a high level of resilience scored higher on social-affective capability than those with a lower level of resilience.

Coping and its relation to resilience were mentioned in two studies *(Ching et al., 2020; Rees et al., 2016)*. *Rees et al. (2016)* reported that coping impacted the overall resilience of students. Moreover, *Ching et al. (2020)* found that students with high resilience demonstrated self-awareness and self-regulation strategies while those with low resilience used maladaptive coping, self-blame, and avoidance strategies.

Personality was reported in three studies as a variable that could affect resilience *(Rees et al., 2016; Wie & Choi 2020; Škodová & ubica Bánovčinová, 2018)*. *Rees et al. (2016)* reported that the positive effect of adaptive coping on resilience intensified as neuroticism decreased and vice versa.

Moreover, *Wie and Choi (2020)* found that resilience was affected by personality traits. Resilience according to personality showed differences, with the introverted group scoring 4.25 points and the extroverted group 5.04 points. Furthermore, according to *Škodová and ubica Bánovčinová (2018),* individual resilience of nursing students has a significant negative correlation with type D personality.

Psychological health/well-being and its relation with resilience were mentioned in four studies *(Chow et al., 2020; Chow et al., 2018; Ríos-Risquez et al., 2016; Smith & Yang, 2017)*. A study conducted by *Ríos-Risquez et al. (2016)* found a significant and negative correlation between psychological health and resilience. Moreover, *Chow et al. (2020)* reported that nursing students' resilience and well-being correlated weakly and positively. On the contrary, a stronger correlation between these variables (resilience and well-being) was found in previous studies of the same student population *Chow et al. (2018); Smith and Yang (2017)*.

5. Discussion

Overall, this review's findings suggested that stress is an unavoidable aspect of nursing students' lives and negatively impacts their psychological health when left unresolved. Therefore, nurse educators should prioritize strengthening nursing students' resilience during their academic programs. These programs would give the students the needed strength and endurance to confidently face the profession.

The results of the current review showed that nursing students face various academic, clinical, and personal stressors *(Ching et al., 2020; Lekan et al., 2018; Nebhinani et al., 2020; Oliveira de Souza et al., 2020; Onan et al., 2019)*. This finding agrees with a previous systematic review conducted by *Pulido-Martos et al. (2012)*. The review reported that the academic and clinical sources were the most common sources of stress (reviews, the workload associated with studying, fear of unknown situations, handling of technical equipment, or making mistakes with patients). Also, a cross-sectional study done in Saudi Arabia by *Alghamdi et al. (2019)* found that the major source of stress was academic load (many assignments or subjects), followed by interface worries, clinical concerns, and personal concerns problems.

However, in this review, the majority of the studies included reported moderate levels of resilience among nursing students *(Chow et al., 2020; Hwang & Shin, 2018; Mathad et al., 2017; Ozsaban et al., 2019; Ríos-Risquez et al., 2016; Smith & Yang, 2017)*, while only one study *Chamberlain et al. (2016)*, reported high resilience scores. This finding could imply that the nursing students may be aware of and use resilience strategies. Following this, Froneman et al. (2016) conducted a study in South Africa. In this study, students reported that various ways to stay resilient included being positive, having a support system, changing study methods, self-motivation, setting personal goals, taking pride, and perseverance and determination.

The vast majority of the studies included in this review showed that the nursing students struggled between a moderate and high level of stress *(Kupcewicz et al., 2020; Nebhinani et al., 2020; Oliveira de Souza et al., 2020; Ozsaban et al., 2019; Sahu et al., 2019; Smith & Yang, 2017)*. However, low-stress levels were reported in one study conducted in India by *Sam and Lee (2020)*.

This finding (moderate to a high level of stress) may be related to that being a nursing student can be a stressful experience, and the nursing education itself is a highly stressful curriculum. Nursing students may face difficulty developing a professional relationship with the healthcare team, coping with stressful conditions, and fear of making mistakes in-hospital procedures. In addition, students may find difficulty in time management, having insufficient time with family, leisure, rest, and a lack of social interactions, which put them under tremendous stress.

Moreover, in this review, six studies referred to the importance of resilience in empowering nursing students to deal with challenges during their education program, and their nursing profession had fewer conflicts in interpersonal relationships and with patients. Also, show greater retention (i.e., more likely to continue their studies), and enhancing psychological health/well-being of nursing students *(Chow et al., 2018; Hwang & Shin, 2018; Lekan et al., 2018; Onan et al., 2019; Ríos-Risquez et al., 2016; Sam & Lee, 2020; Smith & Yang, 2017; Van Hoek et al., 2019)*. In agreement with these findings, *Yılmaz (2017)* stated that resilience help empower nurses to cope with their work environment stressors and therefore maintain healthy psychological functioning.

Furthermore, analysis of the correlation between resilience and stress highlighted variability across the studies included in this review. Some research reported a negative correlation between resilience and stress *(Onan et al., 2019; Sahu et al., 2019; Sam & Lee, 2020; Wie & Choi, 2020)*. In line with this, *Shilpa and Srimathi (2015)* found a negative correlation between stress and resilience. However, other studies in this review, *Oliveira de Souza et al. (2020); Ozsaban et al. (2019),* revealed a non-significant correlation between resilience and stress among nursing students.

In this review, the strategies to improve resilience in nursing students were disparate among the included studies. They were not of direct and significant impact on improving resilience; this may be because resilience is very complex, and many factors affect it. Resilience is difficult because it necessitates the courage to encounter painful realities, the belief that there will be a solution even when one is not obvious, and the determination to keep going despite a nagging gut sensation that the situation is hopeless *(Snyder, 2013)*. In agreement with these findings, a previous integrative literature review by *Thomas and Revell (2016)* reported that three of the nine publications included in the review contained strategies for promoting resilience in nursing students. The strategies were a reflection, simulation and debriefing, and resilience messages delivered through Twitter.

In the current review, several variables were found as a key in understanding the resilience among nursing students. For instance, variables that had positively affected the resilience levels among nursing students: Being in a leadership role *(Smith & Yang, (2017),* self-perception, health status, and major satisfaction *(Wie & Choi, 2020)*. Also, self-efficacy *(Rees et al., (2016),* empathy *(Mathad et al., 2017),* and mindfulness *(Chamberlain et al., 2016; Chow et al., 2020; Mathad et al., 2017; Rees et al., 2016)*. Moreover, Social support and interpersonal relationships *(Hwang & Shin, 2018; Lekan et al., 2018; Ozsaban et al., 2019; Wie & Choi, 2020)*. Furthermore, Social-affective capability as a protective factor for resilience was mentioned in a study by *Hwang and Shin (2018)*. In addition, coping *(Ching et al., 2020; Rees et al., 2016)* and psychological health/well-being *(Chow et al., 2020; Chow et al., 2018; Ríos-Risquez et al., 2016; Smith & Yang, 2017)*.

While, variables that had a negative effect on the resilience levels among nursing students in this review were: Burnout and compassion fatigue *(Chamberlain et al., 2016)* and repetitive negative thinking *(Mathad et al., 2017)*. Moreover, previously earned a college or university degree *(Lekan et al., 2018),*

However, personality was reported in three studies as a variable that could affect positively or negatively resilience *(Rees et al., 2016; Wie & Choi, 2020; Škodová & ubica Bánovčinová, 2018)*. Thus, it is important to address these factors to enhance nursing students' resilience.

Finally, the current review's findings highlighted several recommendations that may be used to inform educational policy and practice concerning resilience and stress among undergraduate nursing students. Overwhelmingly, the studies recommend that resilience empowerment projects and shaping comprehensive programs that promote nursing students' resilience and integrating it as an element in the nursing educational program to buffer against the effects of stress. Courses that aim to build perceptions of self-efficacy, teach mindfulness skills, enhance self-determination through planning and persistence, and encourage feedback that does not place too much emphasis on comparison with peers and adaptive coping are likely to assist student nurses in remaining resilient during their studies.

Also, a supportive learning environment should be created to foster resilience in the students and improve perceived well-being to build up their resilience. It is also necessary to consider reinforcement of social-affective capability as a protective factor for resilience, including self-recognition, self-management, social recognition, and relationship management, which might be considered a means of improving academic resilience. Resilience training may be offered as an elective course, workshop/seminar, or integrated into the curriculum, including self-assessment. Personality traits should be considered when implementing training courses for the improvement of resilience that was emphasized in two papers across this review *(Rees et al., 2016; Škodová & ubica Bánovčinová, 2018)*.

One previous systematic review, *Li and Hasson (2020)*, synthesizes the evidence relating to the interaction of resilience, stress, and well-being in undergraduate nursing students across countries. In total, twelve papers were included, outcome analysis revealed the level of resilience as moderate, stress levels were high, and the incidence of negative psychological health accounts for a proportion of nursing students. The interaction between resilience and stress, and well-being was high. Resilience and low stress were found to better predict well-being. All the studies cited recommendations to inform educational policy and practice about resilience, well-being, and stress among undergraduate nursing students *(Li & Hasson, 2020)*.

6. Limitations

The review was based on only English language databases and did not include grey literature sources limiting the inclusion of other languages. Secondly, the paucity of previous studies since only 22 studies exclusively featured nursing students. The third limitation was that different scales were used to measure stress and resilience among nursing students. Finally, the search was conducted from 2015 to 2020, and new studies may have been published, which are not reflected in the results of this review.

7. Conclusion

This review investigated the relationship between resilience and stress among nursing students and highlighted the importance of resilience in dealing with nursing students' stressors in their academic and practical lives. Six main themes emerged throughout this review, and they were as follows: sources of stress, resilience and stress levels among nursing students, the importance of resilience to nursing students, stress and resilience relationship, strategies to improve resilience in nursing students, and key variables in understanding resilience among nursing students.

8. Recommendations

According to the results of this review, there is a lack of educational programs that focus on building and enhancing resilience among nursing students. Therefore, further research on interventional educational programs that target enhancing resilience among nursing students based on their personality is highly recommended.

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Table (2): Extraction table.

Ser.	Citation/Year/ Location	Study aim	Study design	Sample	Instrument	Main results
1.	Sahu et al. (2019) India	To explore the relationship between levels of stress and resilience with the use of the mobile phone in nursing students.	Cross-sectional Study	102 Undergraduate and postgraduate nursing students	-Perceived Stress Scale (PSS) - Connor-Davidson Resilience Scale (CD-RISC), and -Mobile Phone Involvement Questionnaire (MPIQ) by Walsh.	- 77.5% of the students had stress perception between moderate and high, 20.6% had high resilience capacity, and 25.5% were frequent mobile phone users. - Resilience is significantly negatively correlated with perceived stress.
2.	Smith and Yang (2017) China	To examine the relationship between stress and resilience on psychological well-being in a cohort of Chinese undergraduate student nurses.	Cross-sectional study	A total of 1538 Undergraduate nursing students	-The Stress in Student Nursing (SINS-CN) -Resilience Scale (RS-CN) (25 items) -The General Health Questionnaire (GHQ 12) was also employed to measure psychological well-being in the cohort.	- Moderate levels of resilience were noted across all four years of nursing training programs. The students reported high-stress levels. - Resilience was weakly negatively correlated with the mean total score for stress ($r=-0.236$, $p<0.01$) and negatively correlated with psychological well-being ($r=-0.411$, $p<0.01$). - Students in leadership roles also display higher levels of resilience than other classmates. - The level of resilience may be a good predictor of psychological well-being. - Resilience may help student nurses to deal with the inevitable sources of stress in student nurse training.
3.	Ríos-Risquez et al. (2016) Spain	To examine the relationship between resilience, academic burnout, and psychological health in a sample of nursing students.	Cross-sectional study	113 Final year nursing students	-CD-RISC (10 item version), -MBI-SS -GHQ-12	- Resilience was moderate to high. - Students who expressed a higher level of resilience were less likely to experience academic burnout and showed fewer symptoms of psychological distress (i.e., better perceived psychological health). - Regarding resilience and academic burnout, the nursing students who reported greater resilience also obtained higher scores for academic efficacy and, in turn, lower scores for emotional exhaustion and cynicism. - There is a statistically significant negative relationship between resilience and emotional exhaustion and psychological health and between all three dimensions of burnout and psychological health. - The association between resilience and psychological health (measured as the frequency of psychological symptoms/psychological discomfort) was significant and negative.

Ser.	Citation/Year/ Location	Study aim	Study design	Sample	Instrument	Main results
4.	Chow et al. (2018) Hong Kong	To examine the relationship between resilience and well-being among university nursing students in Hong Kong.	Cross-sectional descriptive correlational design.	678 under and postgraduate nursing students	-The 10-item Connor-Davidson Resilience Scale (CD-RISC-10) -World Health Organisation-5 Well-Being Index (WHO-5)	- The resilience level of Hong Kong university nursing students is relatively low and stagnant. - Bivariate analysis showed that self-reported resilience had a medium, positive correlation with perceived well-being ($r=0.378$, $p=0.000$). - Multivariable regression analysis on perceived well-being indicated that self-reported resilience emerged as a significant predictor of perceived well-being (regression coefficient B $=0.259$; $p <0.001$).
5.	Rees et al. (2016) Australia & Canada	This study aimed to test the newly developed ICWR-1 model of individual psychological resilience among a group of student nurses.	Cross-sectional, quantitative design at each data collection site.	422 Final year Student nurses	-The Connor-Davidson Resilience Scale (10 item version), -The Professional Quality of Life Scale Version 5 (ProQol5) -General Self-Efficacy Scale (GSE) -Cognitive and Affective Mindfulness Scale, Revised (CAMS-R) -The Positive and Negative Affect Scale (PANAS)	- Resilience significantly influenced the relationship between mindfulness, self-efficacy and coping, and psychological adjustment (burnout scores). - Self-efficacy, coping, and mindfulness all impact the overall resilience of students. - Higher mindfulness, higher self-efficacy, and coping scores were associated with lower burnout due to the effect of each variable on resilience. - As the level of neuroticism decrease, the positive effect of adaptive coping on resilience strengthens. Similarly, as neuroticism increases, the negative effect of maladaptive coping on reported resilience strengthens. - Courses that aim to build perceptions of self-efficacy and teach mindfulness and adaptive coping are likely to assist student nurses in remaining resilient during their studies. - Students who are high in neuroticism would benefit the most from educational programs that emphasize adaptive coping strategies such as planning, positive reframing, and seeking support.
6.	Chamberlain et al. (2016) Australia	This paper investigates the predictors of resilience, including dispositional mindfulness and employment status of third-year nursing students from three Australian universities.	Quantitative study	240 Undergraduate third-year nursing students.	-Connor–Davidson Resilience Scale, CD-RISC (10 item version), -Cognitive and Affective Mindfulness Scale-Revised, CAMS-R. -Professional quality of life (The Professional Quality of Life Scale version 5, PROQOL5), such as compassion satisfaction, compassion fatigue and burnout.	- The resilience scores were high overall compared with other similar surveys. - The strongest predictors of resilience were dispositional mindfulness and its subset of acceptance. - Compassion, fatigue, and burnout correlate negatively with resilience and positively with compassion satisfaction.

Ser.	Citation/Year/ Location	Study aim	Study design	Sample	Instrument	Main results
7.	Hwang and Shin (2018) South Korea.	To determine the characteristics of nursing students with high academic resilience.	Cross-sectional design.	254 Third and fourth-year nursing students.	-Academic resilience, scale -Clinical practice stress, scale. -Clinical practice satisfaction tool.	- A total of 90 respondents (35.4%) were assigned to the high resilience group, 146(57.5%) to the moderate resilience group, and 18(7.1%) to the low resilience group. - A greater proportion of respondents with high levels of academic resilience had good interpersonal relationships, high academic grades, and high satisfaction with their major. - Respondents in the high resilience group were more likely to show greater retention, experienced less stress related to the burden of their practice tasks, and were more satisfied with practice content and the practice environment. - The reinforcement of social-affective capability, including self-recognition, self-management, social recognition, and relationship management, might be considered as means of improving academic resilience. - Respondents in the high resilience group had higher social-affective capability scores than those with lower resilience (F=43.994, p<0.001).
8.	Onan et al. (2019) Istanbul	To evaluate a stress-coping course for psychological resilience among a group of university nursing students.	The quantitative study that had a pre-test/ post-test design without a control group	78 First-year nursing students	-Stress Self-assessment Checklist. -The Psychological Resilience Questionnaire (PRQ).	- Significant negative correlations were found between psychological resilience and stress symptoms (r=-0.48; p=0.000). - Fifty-nine percent of the students declared that they experienced a stressful life event other than beginning university, such as moving to another place, changing economic status, or physical health problems, within the last year. - A correlation may exist between stress coping skills and psychological resilience. - Emphasize the potential role of psychological resilience in dealing with the inevitable sources of stress in the education of nursing students. - Nursing students were given stress coping education and were evaluated for psychological resilience. The stress coping course resulted in a non-significant decrease in the frequency of stress symptoms among the students; however, it also led to a significant increase in self-perception and social sources among the subscales of psychological resilience. - Students perceived themselves more positively and reached social resources more comfortably following the course on stress coping. - It can be thought that learning how to cope with stress may increase psychological resilience.

Ser.	Citation/Year/ Location	Study aim	Study design	Sample	Instrument	Main results
9.	Van Hoek et al. (2019) Belgium	This study aimed to explore the influence of socio-demographic factors, resilience, and stress-reducing activities on the academic outcomes of undergraduate nursing students.	Cross-sectional research study	554 Nursing students	-The VK+ Resilience scale and the P3 'Palliative Behaviour' scale were used to measure the respective resilience and stress-reducing activities.	- Resilience appeared to be the only factor with a significant influence on the three academic outcomes: intention to leave, academic success, and dropout.
10.	Kupcewicz et al. (2020) Poland, Spain, and Slovakia	To determine the relationship between stress intensity and coping strategies and the quality of life and health among nursing students in Poland, Spain, and Slovakia.	A diagnostic survey was used as a research method	1002 First, second, third-year nursing students	-Perceived Stress Scale PSS-10, -Mini-COPE Coping Inventory -The WHOQoL-Bref questionnaire.	- Most of the surveyed students rated their stress intensity over the last month as moderate or high.
11.	Ching et al. (2020) Hong Kong China	To explore the stressors and coping of nursing students with differing levels of resilience and burnout during clinical placement.	Qualitative descriptive study	Twenty-four final-year baccalaureate nursing students,	Ten focus group interviews were conducted using a semi-structured interview guide.	- Stressors arise from the students aligning their expectations with the demands of the clinical placement. - Students with high resilience coped by using the mechanism of self-awareness and self-regulation strategies. By contrast, those with low resilience used maladaptive coping, self-blame, and avoidance strategies.
12.	Lekan et al. (2018) The United States.	To explore resilience in senior-level baccalaureate nursing students.	Cross-sectional descriptive design.	Twenty-seven senior nursing students	Resilience was measured using the 25-item Connor-Davidson Resilience Scale (CD-RISC-25) and one open-ended question about the experience of resilience.	- Participants reported that the top contributor of stress in the past year was extreme financial hardship (48%), followed by death or loss of family members or friends (30%), and marriage or divorce (7%). - Only 33.3% of the sample was considered resilient (score >80). - Nurse educators must help nursing students develop resilience to prepare them for academic success and ensure a smooth transition into their professional nursing role. - Resilience strategies include reaching out to others in the support system, working hard, developing a "tough skin," and seeking professional help to manage anxiety and depression to remain resilient. - Students who have previously earned a college or university degree might be especially vulnerable to impaired resilience, as these students typically were older with more complex family and employment obligations in addition to academic demands. - Significant correlations between relationship status and resilience, having "close and secure relationships" scored as true nearly all the time on the CD-RISC-25 by all participants, highlight the importance of social support in resilience.

Ser.	Citation/Year/ Location	Study aim	Study design	Sample	Instrument	Main results
13.	Nebhinani et al. (2020) India	To assess stress and coping strategies among nursing students of Western Rajasthan.	Descriptive study	Two hundred and twenty-one undergraduate nursing students	-Standardized Student Nurse Stress Index -Brief Cope Scale	- Academic load, lack of free time, and fear of examination were the main source of perceived stress among nursing students. - Students considered the attitude of other professionals toward nursing as the most likely reason for their distress. - Overall, perceived stress was high among students.
14.	Liang et al. (2019) Taiwan	To develop and implement a resilience enhancement (RE)-based project for Taiwanese nursing students during their last-mile practicum.	Qualitative Participatory action research (PAR) approach was used in which ongoing planning, action, and reflection informed real-time progress.	Twenty-eight final year nursing students	A six-workshop RE project was completed over two months. Evaluation methods involved group discussion, individual interviews, and reflective diaries.	- The PAR-based RE project helped students develop resilience by enhancing their nursing knowledge and skills and practicing positive thinking and behavior. - In RE, however, mentors create learning environments that empower students through facilitated discussion, coaching, challenging common thinking, and group work. Study participants were guided in defining and setting goals and monitoring their progress. As a result, they became more self-regulated, effective, and resilient, developing autonomous professional practice skills and response strategies.
15.	Wie and Choi (2020) South Korea.	This study aimed to identify the levels of stress, self-perception, and resilience of undergraduate nursing students and recognize the correlations between them.	Descriptive correlational study design	198 Senior nursing students	-Tool of *Yoo et al. (2008)* was developed to measure the stress of nursing students in South Korea. -Resilience Scale (RS) developed by *Wagnild and Young (1993)*	- Stress and resilience are negatively correlated. - Self-perception and resilience were positively correlated (i.e., an increase in self-perception correlates with an increase in resilience and a decrease in self-perception correlates with a decrease in resilience). - Resilience was affected by health status, interpersonal relationships, personality traits, and major satisfaction. - Resilience according to personality showed differences, with the introverted group scoring 4.25 points and the extroverted group 5.04 points.
16.	Oliveira de Souza et al. (2020) São Paulo.	To verify the relationship between stress and resilience in nursing students from two public universities in the state of São Paulo.	Cross-sectional study	117 First-year nursing students.	-Assessment of Stress in Nursing Students (ASNS) -Resilience Scale (RS) developed by *Wagnild and Young (1993)*	- There was a predominance of students with medium stress levels. - Time management and theoretical activities represent a high-stress level for 23.9% and 20.5% of nursing students. - 11.1% had very high stress related to the environment. - Resilience levels were reduced (51%). - Nursing students had reduced levels of resilience, followed by moderate levels. - There was no significant correlation between stress and resilience.
17.	Sam and Lee (2020) India	To assess perceived stress and resilience levels of nursing students.	Cross-sectional study	620 Nursing students	-Perceived stress scale (PSS). -25-item Resilience Scale (RS) was developed by *Wagnild and Young (1993).*	- A study of perceived stress showed that 45.7% of nursing students had severe (high) stress, and 54.3 % had low stress. - A study on resilience showed that 55% of them had low resilience. - Resilience measures should be adapted and made an intrinsic part of the educational program to give students the needed strength and endurance to confidently face the profession. - The study revealed a significant weak negative correlation (r=-0.236, p=< 0.001) between perceived stress and resilience.

Ser.	Citation/Year/ Location	Study aim	Study design	Sample	Instrument	Main results
18.	Ozsaban et al. (2019) Istanbul, Turkey	To evaluate the levels of psychological resilience, academic stress, and social support available to nursing students and the relationship between these factors.	Descriptive and correlational research design	322 Nursing students	-Structured Questionnaire, -The Psychological Resilience Scale for Adults, -The Nursing Education Stress Scale, -The Multidimensional Scale of Perceived Social Support.	- Levels of psychological resilience and academic stress among nursing students are moderate. - A relationship was not found between resilience and the stress levels of students. - A statistically significant correlation was found between scores for psychological resilience and perceived social support (p<0.05). - Programs should aim to increase the level of social support and thus strengthen students' resilience.
19.	Mathad et al. (2017) India	To identify correlates and predictors of resilience among nursing students.	Descriptive correlation study	194 Participants (1-4th year B.Sc. Nursing)	-Freiburg Mindfulness Inventory (FMI), -Toronto Empathy Questionnaire (TEQ), -Perseverative Thinking Questionnaire (PTQ), -Connor-Davidson Resilience Scale (CD-RISC) (10 item version).	- Results evident that students were moderately resilient. - Resilience was significantly correlated with mindfulness, perseverative thinking, and empathy in nursing students. - Based on regression analysis, this model accounted for almost 33% of the variance in resilience. This result is interesting as mindfulness alone explained 23% of the variance, and unproductive Repeated Negative Thinking (RNT) and RNT consuming mental capacity predicted 8% and 2%, respectively. - Resilience was positively correlated with mindfulness and empathy. - There was a negative correlation between resilience and repetitive negative thinking subscales.
20.	Stacey et al. (2017) England	To evaluate an intervention to support pre-registration nursing students to develop resilience-based competencies that enable them to regulate their response to stress and monitor their well-being using mindfulness, reflective discussion, and positive reframing.	The case study methodology was used to explore how the intervention has influenced the characteristics associated with the expression and maintenance of resilience.	A total of 120 Final year students received RBCS supervision from all fields of practice, and all were invited to participate in the study.	-RBCS Resilience Based Clinical Supervision -focus group interviews	- They found that RBCS can support individuals in the development of resilience, taking into consideration the complex social processes and organizational constraints they are exposed to. - Engagement in mindfulness-based stress-reduction strategies and the use of positive reframing was associated with a self-reported increase in levels of resilience. - Participants displayed the ability to use individualized skills introduced, rehearsed, and reinforced within RBCS to manage the complex processes they were exposed to, both directly after RBCS and six months after qualifying. - The Findings showed that participants expressed positive experiences of RBCS. Engagement in mindfulness-based stress-reduction strategies and the use of positive reframing was associated with a self-reported increase in levels of resilience. - All nursing students from one cohort received RBCS on a two-weekly basis during clinical placement in the final six months of their program. Each session lasted two hours and was facilitated by a nursing academic who had attended a three-day training course, aided by compassion-focused therapy practitioners.

Ser.	Citation/Year/ Location	Study aim	Study design	Sample	Instrument	Main results
21.	Chow et al. (2020) China	To develop a resilience-building module for university nursing students and evaluate its effects on resilience, well-being, and mindfulness.	Mixed-methods study	195 First-year nursing students	Resilience-building module. Participants' views and perceptions of the module were explored using pre-and post-test questionnaires and focus group interviews. Students' resilience was measured using -The 10-item version CD-RISC -(WHO-5) Well-Being Index -The psychological well-being of the participants was measured using the WHO-5. -Mindfulness Attention Awareness Scale (MAAS)	- Overall, the study participants reported moderate levels of resilience and well-being. - Both well-being (r=0.218, p = 0.002) and dispositional mindfulness (r=0.437, p<0.001) showed significant positive correlations with resilience. - In a multivariable linear regression analysis, only mindfulness remained significantly associated with resilience (B=0.278, p<0.001), indicating that this variable is a salient independent predictor of resilience. - Resilience-building module comprising three 90-minute workshops on the following topics: Resilience and emotion regulation, stress management and mindfulness, and burnout and depression. - No significant changes in outcomes were observed from the pre-test to the post-test. However, multivariable linear regression analysis indicated that mindfulness was significantly associated with resilience. Qualitative data analysis revealed that the resilience-building module evoked the participants' awareness of resilience and was considered an enjoyable learning experience. - Weak correlation between resilience and well-being among university nursing students. - Better mindfulness was identified as important for enhancing resilience among undergraduate nursing students.
22.	Škodová and ubica Bánovčinová (2018) Slovakia.	To examine the associations between Type D personality and resilience among nursing students.	Correlational study design	150 Baccalaureate nursing students	The Type D personality subscale, sense of coherence questionnaire, and Baruth protective factors inventory were used.	- Type D personality was significantly negatively related to individual resilience in nursing students. - The negative affectivity subscale of the Type D scale was a significant predictor for resilience and a sense of coherence. Students with high levels of Type D characteristics had significantly lower levels of resilience and sense of coherence. - The capacity to cope with stress is reduced among individuals scoring high in Type D personality traits.

Table (3): A quality appraisal of the reviewed studies.

Authors	Abstract	Method and data	Introduction and aims	Sampling	Data analysis	Ethics and bias	Findings/ results	Transferability /generalizability	Implications and usefulness	Total	
Chamberlain et al. (2016)	4	3	3	4	4	3	3	2	3	29	good
Ching et al. (2020)	3	3	3	3	4	3	4	3	3	29	good
Chow et al. (2020)	4	4	3	4	3	3	4	3	4	32	good
Chow et al. (2018)	4	4	3	4	4	3	4	3	4	33	good
Hwang & Shin (2018)	4	3	4	4	4	3	4	3	4	33	good
Kupcewicz et al. (2020)	3	4	4	4	3	3	4	3	3	31	good
Lekan et al. (2018)	4	3	3	3	3	4	3	3	3	29	good
Liang et al. (2019)	4	3	4	4	4	4	3	3	3	32	good
Mathad et al. (2017)	3	4	4	4	4	4	3	3	3	32	good
Nebhinani et al. (2020)	3	4	4	4	3	3	4	3	3	31	good
Oliveira de Souza et al. (2020)	3	4	3	4	3	4	4	3	3	31	good
Onan et al. (2019)	4	3	3	3	4	4	3	3	3	30	good
Ozsaban et al. (2019)	4	4	3	4	3	4	4	3	4	33	good
Rees et al. (2016)	3	4	4	3	4	4	4	3	4	33	good
Ríos-Risquez et al. (2016)	3	3	4	3	4	4	3	3	3	30	good
Sahu et al. (2019)	4	3	4	3	4	3	4	3	4	32	good
Sam and Lee (2020)	4	4	4	4	3	4	4	2	3	32	good
Smith and Yang (2017)	3	3	3	3	4	3	3	3	3	28	good
Stacey et al. (2017)	3	4	3	4	4	3	4	2	4	31	good
Van Hoek et al. (2019)	3	4	3	4	3	4	4	2	3	30	good
Wie and Choi (2020)	4	4	3	4	4	3	4	3	3	32	good
Škodová and ubica Bánovčinová (2018)	4	4	3	4	3	4	3	3	4	32	good