

ORIGINAL RESEARCH:  
EMPIRICAL RESEARCH - QUANTITATIVE

# A multi-level examination of nursing students' resilience in the face of the COVID-19 outbreak: A cross-sectional design

Anat Drach-Zahavy<sup>1</sup>  | Hadass Goldblatt<sup>2</sup>  | Hanna Admi<sup>3</sup>  | Ayala Blau<sup>4</sup> | Irit Ohana<sup>5</sup> | Michal Itzhaki<sup>6</sup> 

<sup>1</sup>Department of Nursing, Faculty of Social Welfare & Health Sciences, University of Haifa, Haifa, Israel

<sup>2</sup>Department of Nursing, Faculty of Social Welfare & Health Sciences, University of Haifa, Haifa, Israel

<sup>3</sup>Nursing Department, Graduate Program, Yezreel Valley College, Jezreel Valley, Israel

<sup>4</sup>Nursing Department, Ariel University, Ariel, Israel

<sup>5</sup>Nursing Department, Ramat Gan Academic College, Ramat Gan, Israel

<sup>6</sup>Nursing Department, School of Health Professions, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

## Correspondence

Anat Drach-Zahavy, Department of Nursing, Faculty of Social Welfare & Health Sciences, University of Haifa, Haifa, Israel.

Email: anatdz@research.haifa.ac.il

## Funding information

None.

## Abstract

**Aims:** To examine nursing students' stress and coping with the coronavirus disease 2019 (COVID-19) pandemic through an ecological model of resilience. Specifically, to examine the relative contribution of different resilience levels in decreasing nursing students' strain symptoms: at the individual level, resilience trait; at the relational level, students' coping strategies; at the university level, nursing students' perceptions on their university's readiness to handle the virus outbreak; and at the national level, nursing students' trust in policymakers' decisions.

**Design:** The study used a cross-sectional design.

**Methods:** Undergraduate students of five universities were recruited via an electronic link sent to their emails during the first months of the COVID-19 outbreak: May–July 2020. Of them, 492 participants completed the research questionnaire.

**Results:** Hierarchical Regression Analysis revealed that nursing students' resilience, as a multi-level factor, decreased the students' level of strain symptoms above and beyond their stress levels and control variables. Specifically, the nursing students' trait resilience, perceptions of their university's positive response to the pandemic and trust in their national policymakers were negatively associated with their strain symptoms. Conversely, disengagement-in-emotion coping strategies was positively associated with the students' strain symptoms.

**Conclusions:** Nursing students' resilience should be seen as a flexible resource that can be developed and influenced by their academic and clinical training, and by the intentions and actions of their university and the nursing administration at the Ministry of Health (MOH).

**Impact:** The findings call for the nursing administration at the MOH and for the university deans and department heads to prepare in advance a crisis plan that could be rapidly and effectively implemented when needed. Furthermore, topics such as developing flexible coping strategies should be integrated into the nursing curricula. These would allow students to prepare and cope better with adversity in their routine and in times of crisis.

## KEYWORDS

COVID-19, nursing students, resilience, strain symptoms, stress

## 1 | INTRODUCTION

One of the important issues that have arisen following the outbreak of the coronavirus disease 2019 (COVID-19) pandemic is how health-care workers are able to cope in this crisis. In fact, the pandemic has intensified the growing research interest in nurses' and nursing students' resilience. The following scenario illustrates a realistic view of nursing students' experience during the pandemic:

A young student attending a class that is discussing the effects of the coronavirus on nursing staff. She tearfully expresses her experience of being obligated to work on a corona ward. She describes the distressing scenes she encountered, the vulnerability and suffering of the patients and their families, and her feelings of helplessness in coping with these situations. She declares that this was not what she had imagined her role would be in nursing and that the gap between what is taught at university and what is required in practice is greater than she thought. The students in the class are sympathetic to her and offer several suggestions including that she takes a vacation, takes care of herself; reminds herself of why she chose nursing as a profession; gets help and comfort from her friends and family; and writes a letter to the nurse in charge to request a transfer to another ward. Nevertheless, after the class, one student approaches the lecturer and opines that the young nurse should toughen up and be more professional.

The scenario described above raises compelling questions about the education and practice of nursing students during this COVID-19 outbreak, as well as in any future crises. It delineates the multiple worries and vulnerabilities specific to nursing students that may affect their well-being. Furthermore, this scene emphasizes that resilience should not be perceived as the sole responsibility of the individual, because by doing so we may fall into the trap of 'blaming the victim'. Rather, resilience should be understood through an ecological lens, as an individual's proactive and interdependent relationship with the larger system (Ungar, 2011).

Resilience research typically centers along three relatively distinct routes of inquiry (Thomas & Revell, 2016). The first route aims to understand the protective virtue of resilience as a personal resource (Heritage et al., 2019; Lekan et al., 2018; Ríos-Risquez et al., 2018). The second route views resilience as a process and attempts to understand the factors affecting resilience among nursing students (Thomas & Revell, 2016). Lastly, the third route considers how resilience is developed and how policymakers and educators can cultivate resilience among nurses and nursing students (e.g., Hodges et al., 2005; Lanz, 2020; Stacey & Cook, 2019; Taylor et al., 2020). The present study aimed to integrate these separate lines of research, proposing an ecological model of nursing students' resilience. Accordingly, resilience encompasses three interwoven

capacities: the capacity of individuals to strive and gain resources that sustain their well-being; the capacity of individuals' physical and social ecologies to provide those resources; and the capacity of individuals, their families, communities and organizations to develop and sustain practical cultural ways for resources to be shared (Ungar, 2008). Specifically, the aim of the study was to examine the relative contribution of different levels of resilience in improving nursing students' well-being under the circumstances of COVID-19, above and beyond their stress levels: the individual level, resilience trait; the relational level, nursing students' coping strategies; the university level, the students' perceptions that their university was ready to handle the virus outbreak and they are protected; and the larger nation's level, the perception of trust in the policymakers decisions (see Figure 1).

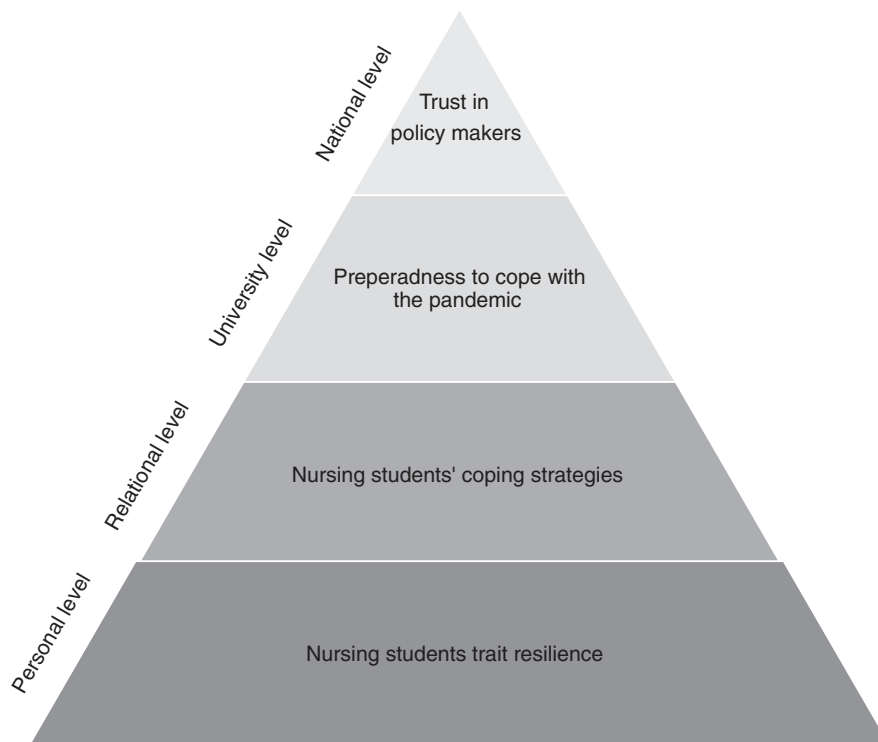
## 2 | BACKGROUND

### 2.1 | Nursing students' stress and strain levels

Academic, personal and clinical stressors are common among nursing students (Li & Hasson, 2020). Academic stressors include the high-intensity workloads that create a competitive and stressful learning environment (Evans, 2008; Jimenez et al., 2009; Reeve et al., 2013). Furthermore, despite being trained in clinical settings, nursing students report being under stress due to insecurity about their clinical competence, fear of making mistakes, relational conflicts with patients or colleagues, conflicts between professional beliefs and the reality in practice, and providing care for patients in vulnerable situations (Admi et al., 2018; Li & Hasson, 2020; Zhao et al., 2015). On a personal level, nursing students are also facing increased financial pressure and difficulties in balancing their private lives and family needs with their work and academic requirements (MacDonald et al., 2016; Turner & McCarthy, 2017). Together, these sources of stress often create an experience of feeling stretched beyond one's capacity (Reeve et al., 2013).

Nursing students' stress has likely intensified with the COVID-19 pandemic. Nursing students are now, more so than at other times, exposed to the circumstances of nursing in practice, that is carrying out clinical care for ill patients in conditions of inadequate resources (Yıldırım et al., 2017). Particularly, they may witness dying patients who cannot say goodbye to their families due to isolation regulations (Ford, 2020). They may also experience moral distress due to their own or other staff members' reluctance to treat coronavirus patients (Sperling, 2020) or watch staff members being exposed to infection, suffering infection and even losing their lives as a consequence of COVID-related care (Cook et al., 2020; Ford, 2020). This could contribute to escalating their pandemic anxiety of getting infected or infecting their loved ones (Kursumovic et al., 2020). Academically, nursing students have faced interruptions in their studies and the rapid need to adapt to e-learning, as well as continuing uncertainties about their clinical training (Aslan & Pekince, 2020).

**FIGURE 1** An ecological model of nursing students' resilience



The negative ramifications of stress on nursing students' well-being, regardless of the pandemic, are well documented in the literature (e.g., Jimenez et al., 2009; Rios-Risquez et al., 2016; Smith & Yang, 2017). Persistent levels of stress may lead to psychological distress and emotional exhaustion, as well as burnout among nursing students (Aburn et al., 2016; Stephens, 2013; Thomas & Revell, 2016). In fact, students of health-care professions generally exhibit higher levels of depressive symptoms, compared with their peers in other academic disciplines (Bakker et al., 2020; Iorga et al., 2018; Mitchell, 2018). In a systematic review of resilience among nursing students (regardless of COVID-19), Li and Hasson (2020) concluded that stress among nursing students hampered their psychological health. Although it is too early to fully understand the long-term impact of the pandemic on nursing students' well-being, several anecdotal reports note an increase in symptoms of anxiety and depression among students (e.g., Bashir et al., 2020; Reverté-Villarroya et al., 2021).

**Hypothesis 1** *Nursing students' perceived stress can increase their strain symptoms.*

## 2.2 | The role of resilience in promoting students' well-being

A central protective factor for nursing students against the negative impacts of stress is resilience (Li & Hasson, 2020; Thomas & Revell, 2016). The concept of resilience still faces considerable scholarly debate in the nursing field and beyond (Masten, 2018; Southwick et al., 2014). In nursing, several scholars define resilience as a relatively stable personal trait (Gillespie et al., 2009; Hodges et al., 2005),

whereas others regard resilience as a more flexible process of bouncing back in the face of adversity (Laschinger & Grau, 2012; Reyes et al., 2015; Sanderson & Brewer, 2017; Windle, 2011), or as an outcome of successful adaptation post-adversity (Vella & Pai, 2019). Either way, all conceptualizations of resilience share four important tenets: the presence of adversity, the accessibility to resources, coping and sustaining or even improving well-being post-adversity.

In this study, we use the definition of resilience, embedded in a socio-ecological perspective that views resilience as the capacity of an individual (here, the nursing student) to anticipate, prepare, cope and adapt under conditions of adversity in ways that maintain and even promote his or her well-being (Ungar, 2011). In our view, that capacity stems from the nursing student's proactive interactions with his or her environment. Ungar (2008) describes this as follows:

The capacity of individuals to navigate their way to resources that sustain well-being; the capacity of individuals' physical and social ecologies to provide those resources; and the capacity of individuals, their families, and communities to negotiate culturally meaningful ways for resources to be shared (p. 225).

The above definition highlights several important aspects of resilience. First, it clearly distinguishes resilience as a capacity or potentiality of successful adaptation, from resilience as an outcome. Second, it addresses the anticipation and preparation aspects of resilience, rather than only the aspect of bouncing back to normalcy; thereby, emphasizing that resilience occurs before, during and after the adversity. Third, the definition highlights the ecological nature of resilience, weaving together personal, relational and contextual resources that increase

adaptation and well-being (e.g., Ungar & Liebenberg, 2011). These may include (but are not restricted to) individual resilience resources (e.g., personal trait resilience), relational resources (e.g., coping strategies, such as physical and psychological support from caregivers) and contextual resources (e.g., a sense of safety from being protected by an organization and trust in decision makers) (see Figure 1).

### 2.2.1 | The individual and relational levels of resilience

#### *Trait resilience*

The individual level of resilience addresses resilience as a relatively stable personal trait that protects individuals against the impact of adversity, thus enabling them to thrive and bounce back in the face of adversity (Connor & Davidson, 2003; Gillespie et al., 2009; Hu et al., 2015). This trait resilience was recently supported by genetic evidence whereby adversity may influence gene expression (Niitsu et al., 2019). A study compared the resilience of nursing students in their first semester to their resilience in their last semester and found no significant difference in resilience scores over time. These findings therefore indicate that resilience, as a personal characteristic, represents a relatively stable variable that is not impacted by factors such as education, experience or professional maturation (Pitt et al., 2014). In fact, the authors suggest that students with low resilience scores likely have lower emotional stability, thereby reducing their ability to face stress. Furthermore, although not specifically addressing the resilience of nursing students, Li and Hasson's (2020) findings, based on a systematic review, demonstrated robust evidence for the argument that nurses' personal resilience contributed to nurses' well-being (Gibbons et al., 2011; He et al., 2018; Heritage et al., 2019; Lekan et al., 2018; Ríos-Risquez et al., 2018).

**Hypothesis 2a** *Nursing students' trait resilience would be negatively associated with their levels of strain symptoms.*

#### *The relational level: Coping strategies*

This study's conceptualization of coping strategies is embedded in the Addison et al., framework. According to this framework, nursing students' coping strategies represent either engagement strategies that involve approach-oriented acts of confrontation with adversity or disengagement avoid-oriented strategies that seek to limit exposure to adversity. The former is often viewed as crucial in limiting the long-term psychological and physiological sequelae of adversity, such as anxiety and depression symptoms and diminished well-being; whereas the latter may help in achieving desirable short-term effects but may potentially lead to longer-term problems, including depressive symptoms (Addison et al., 2007). These engagement/disengagement categories of coping strategies are further typified according to the target of the coping efforts, namely, as either problem-focused

or emotion-focused coping strategies (Folkman & Lazarus, 1986). Problem-focused coping emphasizes management of the stress-producing situation, whereas emotion-focused coping emphasizes the regulation of one's affective response. Thus, some coping strategies may be considered personal coping styles, but others are actualized through relational strategies (e.g., seeking support from colleagues and family). Thus, it is difficult to distinguish here between personal and relational coping strategies.

Currently, there is little research on nursing students' coping strategies and studies that do exist have focused mainly on seeking social support from family and colleagues (categorized as an engagement-in-emotion strategy). Specifically, these studies' findings revealed that integrating a support peer group in the nursing program and receiving encouragement from family and friends contributed to nursing students' resilience (Carroll, 2011; Crombie et al., 2013). Notably, when considering the vast literature on coping strategies in general (El-Shafei et al., 2018; Folkman and Lazarus, 1986; Lazarus, 1991; Prochnow et al., 2020), in extreme situations when engagement-in-problem-solving is not feasible, engagement-in-emotion coping strategies could also mitigate stress and improve well-being (Gross & John, 2003; Lazarus, 1991).

**Hypothesis 2b** *Students' engagement-in-problem-solving and engagement-in-emotion coping strategies can decrease strain symptoms, whereas students' disengagement coping strategies can increase strain symptoms.*

#### *The organizational level: Readiness of the university to protect students*

Our model further suggests that nursing students' perceptions of their academic institution's readiness and response to the pandemic may contribute to their level of resilience and decrease their strain symptoms. Accordingly, if nursing students perceive that their university is prepared for a pandemic crisis, it reassures them that the situation is under control and decreases their level of fear. Under such circumstances, students more likely engage in worry control rather than fear control (Witte et al., 2001) and thus exhibit health promoting behaviours and improved resilience (Kelloway et al., 2012). Conversely, if nursing students perceive that their academic institution has a poor response to the pandemic crisis, this will increase their level of fear. Consequently, students may engage more with fear control behaviours and may discount health warnings and health messages, which in turn may reduce their resilience (Kelloway et al., 2012).

**Hypothesis 3** *Students' positive perceptions of a university's response to the pandemic can decrease their strain symptoms.*

#### *The national level: Trust in policymakers*

Finally, our model proposes that on the national level of resilience, nursing students' perceived trust of policymakers also contributes to their level of resilience and decreases their strain symptoms.

'National resilience is a broad concept addressing issues of social sustainability and strength in several diverse realms: trust in the integrity of the government, the parliament and other national institutions, belief in social solidarity and patriotism' (Kimhi et al., 2020a, P. 2). Indeed, the COVID-19 outbreak has spurred interest in the links between resilience and social and political trust, although many acknowledge that this issue has not been widely studied (e.g., Helliwell et al., 2018; Kimhi et al., 2020a). Preliminary evidence outside of the nursing field suggests that national resilience does not add to the prediction of distress syndromes (Eshel et al., 2020; Kimhi et al., 2020a). However, we propose that nursing students are critically dependent upon decisions from the Ministry of Health (MOH); thus, trust in policymakers should add to their resilience.

**Hypothesis 4** *Nursing students' trust in national policymakers can decrease their strain symptoms.*

### 3 | THE STUDY

#### 3.1 | Aims

The study aimed to examine the relative contribution of different levels of resilience in improving nursing students' well-being and decreasing their strain symptoms. Specifically, at the individual level, nursing students' personal resilience trait; at the relational level, nursing students' coping strategies; at the university level, nursing students' perceptions of their university's readiness to handle the virus outbreak and protect the students; and lastly, at the national level, nursing students' trust in policymakers' decisions.

#### 3.2 | Design

The study used a cross-sectional design.

#### 3.3 | Participants

Nursing students were recruited from five universities and colleges across Israel. In Israel, students continued their clinical practice during that period. Inclusion criterion was enrolling in an undergraduate Nursing Program. They were invited to participate in the study via an electronic flyer sent to their email address. It described the study's aims and then gave directions to access an electronic link to an online questionnaire sent from Qualtrics and ics™. The link was accessible to enrolled students for 52 days (from 14 May to 4 July 2020). The study questionnaire was completed and submitted online with no interference from the research team. To ensure a power of at least 0.80, medium to large effect size for all our hypotheses, and based on  $\alpha = 0.05$ , a total of 429 nurses were needed. This calculation was performed via Statistical Package for the Social Sciences 27 software (SPSS, Inc.).

#### 3.4 | Measures

*Perceived stress* was measured using the NASA Task Load Index (Hart, 2006), assessing the subjective workload stemming from multi-source demands, including mental, physical, temporal, frustration, effort and performance stressors. Each demand was assessed on a Likert-type scale (ranging from 1 = a very low extent to 20 = a very high extent) (Cronbach's  $\alpha$  was = 0.75).

*Coping strategies* were assessed with the 16-item (rated on a 5-point Likert-type scale ranging from 1 = never to 5 = always) Coping Strategies Inventory Short Form (CSISF) (Addison et al., 2007). Four items assessed engagement-in-problem-solving strategies, for example, 'I make a plan of action and follow it' ( $\alpha = 0.49$ ); four items assessed disengaged-in-problem-solving strategies, for example, 'I hope the problem will take care of itself' ( $\alpha = 0.46$ ); four items assessed engaged-in-emotion coping strategies, for example, 'I let my feelings out to reduce the stress' ( $\alpha = 0.67$ ); and four items assessed disengaged-in-emotion coping strategies, for example, 'I try to spend time alone' ( $\alpha = 0.44$ ).

*Personal resilience* was measured with the 10-item Connor-Davidson Resilience Scale (CD-RISC; 2003). Students were asked to rate on a Likert-type scale ranging from 1 = totally disagree to 5 = totally agree the degree they agreed with the 10 items, for example, 'I tend to bounce back quickly after hard times' ( $\alpha = 0.77$ ).

*The nursing department's perceived preparedness to respond to the COVID-19 pandemic* was assessed with a preparedness scale adapted from Kelloway et al., (2012). The respondents were asked to rate each item on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. An example item is 'the nursing department took appropriate steps to protect students' (Cronbach's  $\alpha = 0.81$ ).

*Trust in nurses' policymakers* was assessed with the 15-item trust in administrators scale adapted from Tzafir and Dolan (2004). Respondents were asked to rate on a Likert-type scale (ranging from 1 = not at all to 7 = to a very high extent) the degree they could trust the decisions made by the nursing administration division of the MOH. An example item is 'policymakers at the nursing administration could be trusted in helping me solve problems that occurred during the pandemic' ( $\alpha = 0.87$ ).

*Strain symptoms* were assessed with the SSQ-14 questionnaire (Patel et al., 1997). Items are rated on a 5-point Likert-type ranging from 1 = not at all to 5 = always. An example item 'I had stomach aches' ( $\alpha = 0.88$ ).

*Sociodemographic, academic and clinical experience background data:* Nursing students were asked to report their clinical experience with coronavirus patients as well as their worries related to the pandemic. Furthermore, we controlled for several socio-demographic (gender, age and family status) as well as academic (academic institution and year of study) variables.

#### 3.5 | Ethical considerations

The research protocol was approved by each academic institution's ethics committee. Consent was considered to be given by survey

completion and submission. No identifying data were collected in the survey.

### 3.6 | Data analysis

Descriptive statistics, such as frequencies, means and standard deviations, were used for the demographic data and the main study variables. To test the research hypotheses, a multiple hierarchical regression analysis was conducted to assess the unique contribution of a set of variables above and beyond the variables defined in previous steps.

### 3.7 | Validity, reliability and rigour

The research was guided by the Strengthening the Reporting of Observational studies in Epidemiology guidelines. The study variables were selected using a strong theoretical basis to measure an individual's beliefs about their resilience and ways to decrease strain symptoms. All questionnaires were validated scales that were used before by health-care professionals.

## 4 | RESULTS

### 4.1 | Sample characteristics

The sample consisted of 492 nursing students. The response rate for voluntary recruitment and completion of the online questionnaire was 42%. The socio-demographic and academic characteristics of the participating students are described in Table 1. The distribution of the students across gender and religion corresponded to Israel's demographic distribution. Thirty seven percent of the students were

TABLE 1 Sample characteristics (n = 492)

Gender	Female	84.4%
Family status	Single	64.6%
	Married	31.8%
	Divorced	3.6%
Year of study	1st year	37%
	2nd year	23%
	3rd and 4th year	40%
Ethnicity	Jewish	59.5%
	Muslims	30.2%
	Christians	7.4%
	Druze	
Age	Mean	25.34
	SD	4.30
	Range	19–46 years

in their first year of study, 23% in their second year and 40% in their third or fourth year.

About contact with patients, 23.7% of the students reported that they treated suspected coronavirus patients and 7.4% reported that they treated verified coronavirus patients. This resulted in 10.1% of nursing students required to isolate due to possible contact with verified patients. About finances, 62% of the students reported that their income or that of a relative was harmed due to the virus. Nursing students ranked as moderately high (on a 7-point Likert-type scale ranging from 1 to 7) their worries that the coronavirus will harm their academic studies (Mean = 4.36; SD 1.36) and their finances (Mean = 4.22; SD 1.24) and infect their parents and relatives (Mean = 4.13; SD 1.33). However, they rated their fear of getting infected themselves as moderately low (Mean = 3.50; SD 1.38).

### 4.2 | Descriptive statistics

The nursing students rated their mean level of strain symptoms as moderate (Mean = 2.94; SD 0.47), and this did not vary with the year of study. This included 48.3% of students who ranked their level of symptoms as moderately low (between 2 and 3), 50% as moderately high (between 3 and 4) and 1.7% as high (higher than 4). The levels of overload (on the NASA-TLX), resilience (on the CD-RISC), problem-solving disengagement coping strategies (on the CSISF) and trust in policymakers demonstrated somewhat minor significant differences across students of different academic years (see Table 2). Specifically, the perceived overload was significantly lower in fourth-year senior students compared with more junior students attending their first, second or third years. Similarly, personal resilience of more senior students (third and fourth years) was significantly higher than that of first-year junior students. The mean use of disengagement in problem-solving coping strategies was highest among first-year junior students and significantly decreased among more senior third- and fourth-year students, whilst trust in policymakers was lowest among third-year students. The level of nursing students' strain symptoms, their perception of the university's preparedness and their use of other coping strategies (problem focused engagement and disengagement and emotion-focused disengagement) did not differ across academic year.

### 4.3 | Hypotheses testing

Table 3 presents the means and standard deviations and a correlation matrix of the study variables. To test hypotheses 1–4, a hierarchical linear regression analysis was conducted (Table 4). None of the control variance had a significant effect on the students' strain symptoms (Table 4 model 1: controls). In line with hypothesis 1, perceived stress was positively linked to perceived strain symptoms ( $\beta = 0.36$ ;  $p < 0.001$ ), contributing to about 11% of the explained variance in the students' perceived strain symptoms (Table 4 model 2: stressors). In line with hypothesis 2a, nursing students' personal resilience was



TABLE 2 Means and standard deviation of study variables by students' year of study

Variable	1st year	2nd year	3rd year	4th year	Total <sup>a</sup>
Perceived overload	12.46 <sup>b</sup> (3.60)	11.78 <sup>b</sup> (3.70)	11.64 <sup>b</sup> (3.68)	10.70 <sup>c</sup> (3.51)	11.86 <sup>**</sup> (3.67)
Resilience	2.32 <sup>b</sup> (0.41)	2.42 (0.47)	2.47 <sup>c</sup> (0.44)	2.49 <sup>c</sup> (0.41)	2.42 <sup>**</sup> (0.44)
Problem-solving disengagement	2.92 <sup>b</sup> (0.60)	2.80 (0.58)	2.76 <sup>c</sup> (0.52)	2.73 <sup>c</sup> (0.55)	2.81 <sup>*</sup> (0.57)
Trust in policy makers	4.29 <sup>b</sup> (0.85)	4.08 <sup>b</sup> (0.85)	3.64 <sup>c</sup> (0.77)	4.01 <sup>c</sup> (0.82)	4.02 <sup>***</sup> (0.86)

Study variables are shown as means with standard deviations in brackets.

<sup>a,b,c</sup>To examine significant differences among years of study, one-way ANOVA tests were conducted with Tuckey Post-Hoc tests; Means labeled with different letters are significantly different.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

significantly and negatively linked to perceived symptoms ( $\beta = -0.12$ ;  $p < 0.05$ ). In partial support of hypothesis 2b, disengagement-in-problem-solving coping strategies were significantly and positively linked to perceived symptoms ( $\beta = 0.20$ ;  $p < 0.01$ ). No other coping strategy was related with perceived symptoms ( $p > 0.05$ ). These resources contributed an additional 6% to the explained variance in perceived strain symptoms. In line with hypothesis 3, we found that the university's perceived preparedness to cope with the pandemic was negatively linked to students' symptoms ( $\beta = -0.15$ ;  $p < 0.01$ ), contributing another 1% to the explained variance in the students' symptoms. Finally, in line with hypothesis 4, students' trust in policymakers was significantly and negatively related to their symptoms ( $\beta = -0.16$ ;  $p < 0.01$ ), contributing an additional 2% to the explained variance in students' perceived symptoms.

## 5 | DISCUSSION

This study embraced an ecological perspective of resilience, arguing that nursing students' ability to sustain their well-being in the face of COVID-19 is a multi-layered phenomenon. This encompasses a student's personal and relational resources, their perception of the university's preparedness to cope with the pandemic and their trust in policymakers' intentions and actions to combat the pandemic.

The study's findings provide evidence that nursing students represent a poli-vulnerable group since the COVID-19 outbreak. Namely, the students are concerned about their academic future and economic well-being as well as fear that they may infect their parents. However, the findings show that they are much less worried about getting infected themselves. Their worries contribute to their perception of physical, mental and emotional stressors, which is generally moderate (e.g., Aslan & Pekince, 2020). Additionally, our findings revealed that whilst concerns related to the pandemic are the same for all students, regardless of their academic year of study, perceived stress levels (as measured by the NASA-TLX tool) decreased as students progressed in their academic program. Perhaps, students 'toughen-up' and learn to address stressors through their academic and clinical training.

In this study, personal resilience is evidently an important personal resource that helps to mitigate strain symptoms and sustain well-being during the pandemic. This finding accords with earlier

studies that have identified trait resilience as one of the strongest predictors of the ability of individuals (Kimhi et al., 2017; Nair et al., 2020; Shanahan et al., 2017), particularly nursing students (Li & Hasson, 2020; Thomas & Revell., 2016), to cope with a variety of hazards, including the COVID-19 crisis. Seemingly, the role of trait resilience in coping with the pandemic's threats is even more fundamental compared with terror or natural disaster threats (Kimhi et al., 2020b). The COVID-19 pandemic introduced a 'vujá-de' phenomenon (Weick, 1993, p. 633), namely a phenomenon of sense-making collapse, where nursing students sense that the world as they know it will never be the same again (Cohen et al., 2020; Hayter & Jackson, 2020). Namely, in an ambiguous reality where rules and conditions change daily, one cannot rely on leaders' instructions and solutions as those also keep changing according to the emerging circumstances. Under these unpredictable conditions, personal resources probably flourish (Kimhi et al., 2020b). In this regard, the improvement in nursing students' personal resilience with increased seniority of study is worth mentioning. In contrast to previous findings (Lanz, 2020), it may indicate that although resilience seems a relative stable trait-like characteristic (Connor & Davidson, 2003), it can be strengthened by education and experience. Our finding that fourth-year senior students revealed the highest personal resilience score suggests that experiencing and coping with real-life clinical practice during the pandemic can indeed improve the students' ability to decrease their strain symptoms.

Consistent with previous findings in the general coping-with-stress literature, this study's findings demonstrated that using disengagement-in-problem-solving coping strategies aggravates nursing students' symptoms of strain (Addison et al., 2007; Folkman & Lazarus, 1986). Optimistically, our results showed that as the nursing students approach the completion of their nursing degree, the employment of this strategy lessened. Perhaps, 4 years of academic study and clinical experience prepare students with the knowledge and skills to drop inefficient coping strategies. Furthermore, the nonsignificant effects of engagement (either in the form of problem-solving or emotional coping strategies) on nursing students' strain symptoms are surprising. One reason for these findings may be that engagement-in-problem-solving coping strategies are not sufficiently effective during a crisis such as the COVID-19 pandemic. Under these circumstances, engagement-in-emotion coping strategies might be more effective (El-Shafei et al., 2018; Prochnow et al.,

TABLE 3 Means, standard deviations (SD) and the correlation matrix of the research variables

Variables	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Overload	11.86	3.67	1.00								
(2) Personal resilience	2.42	0.44	-0.18**	1.00							
(3) Problem-solving Engagement	3.26	0.62	0.05	0.10*	1.00						
(4) Emotional-engagement	3.26	0.51	-0.10*	0.29**	0.24**	1.00					
(5) Problem solving-disengagement	2.81	0.56	0.06	-0.20**	0.08	0.04	1.00				
(6) Emotional-disengagement	2.95	0.54	0.07	-0.02	0.02	0.17*	0.21**	1.00			
(7) Department's preparedness	3.13	0.60	-0.15**	0.19*	0.01	0.13*	0.04	0.11*	1.00		
(8) Trust in policy makers	4.03	0.86	-0.16**	0.08	-0.01	0.15*	0.04	0.02	0.42**	1.00	
(9) Strain symptoms	2.94	0.47	0.33**	-0.14**	0.06	0.05	0.22**	0.12*	-0.16**	-0.20	1.00

\* $p < 0.05$ ; \*\* $p < 0.01$ 

2020). Nevertheless, the study's findings indicate that engagement-in-emotion coping strategies are also not perceived to be effective by nursing students. Support for this has been provided from previous research, showing that nurses use *disengagement-in-emotion* coping strategies such as toughening up, emotional toughness and emotional detachment to cope with workplace stressors (Hart et al., 2014).

To the best of our knowledge, this is the first study to demonstrate that nursing students' perceptions of higher levels of resilience, such as from their university and national policymakers, protect their well-being. The nursing students' perception of their university's preparedness to cope with the hazards of a pandemic may create an especially valuable atmosphere of stability and safety in such uncertain circumstances (Kelloway et al., 2012). Furthermore, the findings that nursing students' trust in the MOH's intentions and actions to handle the COVID-19 outbreak contributed to their well-being and lessened their strain symptoms are new (Kimhi et al., 2020a). Perhaps, nursing students are critically dependent upon the decisions of the MOH. During the first stage of the pandemic outbreak, nursing students were expected to complete their clinical studies, or even to work in hospitals to augment the nursing workforce, whilst other students were forced to stop their clinical studies due to the sudden outbreak on the wards. Our study's finding of a decline in national-level resilience among third-year nursing students when they enter their clinical studies may be because they may at that point in time be disappointed with the insufficient protection and safety the MOH provided for them.

In summary, university (or college) and national levels of resilience impact nursing students' well-being. More specifically, their perception of their academic institution's preparedness contributed 1%, and their trust in policymakers contributed 2% to the explained variance in the nursing students' strain symptoms above and beyond their perceived stress and personal and relational resilience. These findings support the ecological model of resilience, arguing that social support and higher-level exchange of resources is needed; without it, maintaining resilience during a disaster is difficult (Hobfoll, 1989; Ungar, 2008). The fact that these levels of resilience have had only modest contributions should not diminish their perceived utility to nursing students and universities, as even a small preventive effect can have a substantial impact at the organizational level (Vanhove et al., 2016).

## 5.1 | Study limitations

The main limitation of the study was the cross-sectional design that could not provide a complete picture of the multi-level resilience and well-being of students as the COVID-19 pandemic unfolded. Secondly, although the survey was conducted online, it was sent as an e-flyer to students' university official e-mail addresses, making the opportunity that the respondents were not all students less likely. Thirdly, the relational resilience findings could be biased due



TABLE 4 Multiple hierarchical regression analysis

	Model 1: Controls	Model 2: Stressors	Model 3: Personal resilience resources	Model 4: Departmental resilience resources	Model 5: National resilience resources
	$\beta$ (SE)	$\beta$ (SE)	$\beta$ (SE)	$\beta$ (SE)	$\beta$ (SE)
Gender	0.11 (0.07)	0.07 (0.07)	0.05 (0.07)	0.06 (0.07)	0.07 (0.07)
Religion	0.05 (0.03)	0.02 (0.03)	-0.06 (0.03)	-0.03 (0.03)	-0.02 (0.02)
Family status	0.08 (0.04)	0.06 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
Academic institution	-0.09 (0.02)	-0.04 (0.02)	-0.01 (0.02)	-0.03 (0.02)	-0.02 (0.02)
Year of study	-0.05 (0.02)	-0.02 (0.02)	0.02 (0.02)	-0.01 (0.02)	-0.04 (0.02)
Subjective stress		0.36 (0.01) <sup>***</sup>	0.35 (0.01) <sup>***</sup>	0.32 (0.01) <sup>***</sup>	0.30 (0.01) <sup>***</sup>
Personal resilience			-0.12 (0.06) <sup>*</sup>	-0.10 (0.06)	-0.10 (0.06)
Problem-solving engagement			0.01 (0.05)	0.03 (0.05)	0.05 (0.05)
Problem solving disengagement			0.20 (0.05) <sup>**</sup>	0.20 (0.05) <sup>***</sup>	0.21 (0.05)
Emotional engagement			0.04 (0.04)	0.04 (0.04)	0.04 (0.04)
Emotional disengagement			0.05 (0.05)	0.06 (0.05)	0.06 (0.05)
Department's preparedness				-0.15 (0.04) <sup>**</sup>	-0.09 (0.05)
Trust in policy makers					-0.16 (0.03) <sup>**</sup>
F	F = 1.62	F = 7.69 <sup>***</sup>	F = 6.09 <sup>***</sup>	F = 6.09 <sup>***</sup>	F = 6.16 <sup>***</sup>
Sig. F Change	0.15	0.01	0.01	0.02	0.02
RSquare	0.3	0.14	0.20	0.21	0.23

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

to the low internal reliability of the scales. Yet, a low alpha value could result from the limited number of items covering the scales, thereby not necessarily indicating a low validity of the findings (Tavakol & Dennick, 2011). Finally, the lack of differences among students from five different universities in Israel supports the *generalizability* of the results. Yet, our model should be further tested in other contexts.

## 6 | CONCLUSION

The findings support the ecological model of resilience, arguing that as personal, relational, organizational and national resilience is augmented, nursing students are able to maintain their well-being and are less susceptible to strain symptoms. These findings call for the nursing administration at the MOH, as well as university deans and heads of departments, to prepare in advance a crisis plan that could be rapidly and effectively implemented when needed. This has been also argued many times since the COVID-19 pandemic started. Such a plan should outline strategies to detect early signs of the crisis and procedures that should be implemented to allow students to adjust academically, emotionally and socially to their academic and clinical studies. By informing students the steps that the MOH/college/university authorities have taken to respond to the disease outbreak, the authorities can increase the

likelihood that students will cooperate and engage in appropriate practices and thereby enhance the containment of the outbreak. Furthermore, study topics such as developing a repertoire of flexible coping strategies and how to regulate emotions when encountering challenges should be integrated into the nursing curricula. Such areas of study would allow students to prepare and cope better with adversity in their routine nursing practice as well as during times of crisis.

## ACKNOWLEDGEMENTS

We wish to thank the undergraduate nursing students who participated in this study.

## CONFLICT OF INTEREST

None.

## PEER REVIEW

The peer review history for this article is available at <https://publons.com/publon/10.1111/jan.14951>.

## ORCID

Anat Drach-Zahavy  <https://orcid.org/0000-0002-1826-5117>

Hadass Goldblatt  <https://orcid.org/0000-0003-1554-5348>

Hanna Admi  <https://orcid.org/0000-0003-4965-3347>

Michal Itzhaki  <https://orcid.org/0000-0002-5182-403X>

## REFERENCES

- Aburn, G., Gott, M., & Hoare, K. (2016). What is resilience? An integrative review of the empirical literature. *Journal of Advanced Nursing*, 72(5), 980–1000. <https://doi.org/10.1111/jan.12888>
- Addison, C. C., Campbell-Jenkins, B. W., Sarpong, D. F., Kibler, J., Singh, M., Dubbert, P., Wilson, G., Payne, T., & Taylor, H. (2007). Psychometric evaluation of a Coping Strategies Inventory Short-Form (CSI-SF) in the Jackson Heart Study cohort. *International Journal of Environmental Research and Public Health*, 4(4), 289–295. <https://doi.org/10.3390/ijerph200704040004>
- Admi, H., Moshe-Eilon, Y., Sharon, D., & Mann, M. (2018). Nursing students' stress and satisfaction in clinical practice along different stages: A cross-sectional study. *Nurse Education Today*, 68, 86–92. <https://doi.org/10.1016/j.nedt.2018.05.027>
- Aslan, H., & Pekince, H. (2020). Nursing students' views on the COVID-19 pandemic and their perceived stress levels. *Perspectives in Psychiatric Care*, 57(2), 695–701. <https://doi.org/10.1111/ppc.12597>
- Bakker, E. J. M., Kox, J. H. A. M., Boot, C. R. L., Francke, A. L., van der Beek, A. J., & Roelofs, P. D. D. M. (2020). Improving mental health of student and novice nurses to prevent dropout: A systematic review. *Journal of Advanced Nursing*, 76(10), 2494–2509. <https://doi.org/10.1111/jan.14453>
- Bashir, M. F., Ma, B. J., Bilal, M., Komal, B., Bashir, M. A., Farooq, T. H., Iqbal, N., & Bashir, M. (2020). Correlation between environmental pollution indicators and COVID-19 pandemic: A brief study in Californian context. *Environmental Research*, 187, <https://doi.org/10.1016/j.envres.2020.109652>
- Carroll, S. (2011). *Resiliency as a factor in the successful completion of a California community college based associate degree in nursing program*. California Lutheran University.
- Cohen, O., Mahagna, A., Shamia, A., & Slobodin, O. (2020). Health-care services as a platform for building community resilience among minority communities: An Israeli pilot study during the COVID-19 outbreak. *International Journal of Environmental Research and Public Health*, 17(20), 1–14. <https://doi.org/10.3390/ijerph17207523>
- Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety*, 18(2), 76–82. <https://doi.org/10.1002/da.10113>
- Cook, T., Kursumovic, E., & Lennane, S. (2020). *Exclusive: Deaths of NHS staff from COVID-19 analysed*. HSJ.
- Crombie, A., Brindley, J., Harris, D., Marks-Maran, D., & Thompson, T. M. (2013). Factors that enhance rates of completion: What makes students stay? *Nurse Education Today*, 33(11), 1282–1287. <https://doi.org/10.1016/j.nedt.2013.03.020>
- El-Shafei, D. A., Hammam, R. A. M., Abdelsalam, A. E., & Elgohary, H. (2018). Professional quality of life, wellness education, and coping strategies among emergency physicians. *Environmental Science and Pollution Research*, 25(9), 9040–9050. <https://doi.org/10.1007/s11356-018-1240-y>
- Eshel, Y., Kimhi, S., & Marciano, H. (2020). Predictors of national and community resilience of Israeli border inhabitants threatened by war and terror. *Community Mental Health Journal*, 56(8), 1480–1488. <https://doi.org/10.1007/s10597-020-00592-w>
- Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers and Education*, 50(2), 491–498. <https://doi.org/10.1016/j.compedu.2007.09.016>
- Folkman, S., & Lazarus, R. S. (1986). Stress processes and depressive symptomatology. *Journal of Abnormal Psychology*, 95(2), 107–113. <http://pascal-francis.inist.fr/vibad/index.php?action=search&terms=7926073>
- Ford, S. (2020). Nursing student and agency nurse die in coronavirus outbreak. *Nursing Times*, <https://www.nursingtimes.net/>
- Gibbons, C., Dempster, M., & Moutray, M. (2011). Stress, coping and satisfaction in nursing students. *Journal of Advanced Nursing*, 67(3), 621–632. <https://doi.org/10.1111/j.1365-2648.2010.05495.x>
- Gillespie, B. M., Chaboyer, W., & Wallis, M. (2009). The influence of personal characteristics on the resilience of operating room nurses: A predictor study. *International Journal of Nursing Studies*, 46(7), 968–976. <https://doi.org/10.1016/j.ijnurstu.2007.08.006>
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85(2), 348–362. <https://doi.org/10.1037/0022-3514.85.2.348>
- Hart, P. L., Brannan, J. D., & de Chesnay, M. (2014). Resilience in nurses: An integrative review. *Journal of Nursing Management*, 22(6), 720–734. <https://doi.org/10.1111/j.1365-2834.2012.01485.x>
- Hart, S. G. (2006). NASA-Task Load Index (NASA-TLX); 20 years later. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 50(9), 904–908. <https://doi.org/10.1177/154193120605000909>
- Hayter, M., & Jackson, D. (2020). Pre-registration undergraduate nurses and the COVID-19 pandemic: Students or workers? *Journal of Clinical Nursing*, 29(17–18), 3115–3116. <https://doi.org/10.1111/jocn.15317>
- He, F. X., Turnbull, B., Kirshbaum, M. N., Phillips, B., & Klainin-Yobas, P. (2018). Assessing stress, protective factors and psychological well-being among undergraduate nursing students. *Nurse Education Today*, 68, 4–12. <https://doi.org/10.1016/j.nedt.2018.05.013>
- Helliwell, T., Muller, S., Zwierska, I., Lawton, S., Richardson, J., Hider, S. L., & Mallen, C. (2018). Challenges of diagnosing and managing polymyalgia rheumatica: A multi-methods study in UK general practice. *British Journal of General Practice*, 68(676), e783–e793. <https://doi.org/10.3399/bjgp18X699557>
- Heritage, B., Rees, C. S., Osseiran-Moisson, R., Fagence, A., Sutton, K., Brown, J., Chamberlain, D., Cusack, L., Anderson, J., Terry, V. R., Hemsworth, D., & Hegney, D. G. (2019). A re-examination of the individual differences approach that explains occupational resilience and psychological adjustment among nurses. *Journal of Nursing Management*, 27(7), 1391–1399. <https://doi.org/10.1111/jonm.12820>
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>
- Hodges, H. F., Keeley, A. C., & Grier, E. C. (2005). Professional resilience, practice longevity, and Parse's theory for baccalaureate education. *Journal of Nursing Education*, 44(12), 548–554. <https://doi.org/10.3928/01484834-20051201-04>
- Hu, H. X., Liu, T. L., Zhao, F. J., Yao, Y. Y., Gao, Y. X., & Wang, G. R. (2015). Factors related to job burnout among community nurses in Changchun, China. *Journal of Nursing Research*, 23(3), 172–180. [https://journals.lww.com/jnr-twna/Fulltext/2015/09000/Factors\\_Related\\_to\\_Job\\_Burnout\\_Among\\_Community.4.aspx](https://journals.lww.com/jnr-twna/Fulltext/2015/09000/Factors_Related_to_Job_Burnout_Among_Community.4.aspx)
- Iorga, M., Dondas, C., & Zugun-Eloae, C. (2018). Depressed as freshmen, stressed as seniors: The relationship between depression, perceived stress and academic results among medical students. *Behavioral Sciences*, 8(8), 70–81. <https://doi.org/10.3390/bs8080070>
- Jimenez, B. A., Browder, D. M., & Courtade, G. R. (2009). An exploratory study of self-directed science concept learning by students with moderate intellectual disabilities. *Research and Practice for Persons with Severe Disabilities (RPSD)*, 34(2), 33–46. <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ889380&site=eds-live>
- Kelloway, E. K., Mullen, J., & Francis, L. (2012). The stress (of an) epidemic. *Stress and Health*, 28(2), 91–97. <https://doi.org/10.1002/smi.1406>
- Kimhi, S., Dror, G., & Sterne, S. (2017). Resilience among students from the majority and minority group: The Israeli case. *Journal of Psychology and Behavioral Science*, 5, 37–46. <https://doi.org/10.15640/jpbs.v5n1a5>
- Kimhi, S., Marciano, H., Eshel, Y., & Adini, B. (2020a). Recovery from the COVID-19 pandemic: Distress and resilience. *International*

- Journal of Disaster Risk Reduction*, 50, <https://doi.org/10.1016/j.jidrr.2020.101843>
- Kimhi, S., Marciano, H., Eshel, Y., & Adini, B. (2020b). Resilience and demographic characteristics predicting distress during the COVID-19 crisis. *Social Science & Medicine*, 265, <https://doi.org/10.1016/j.socscimed.2020.113389>
- Kursumovic, E., Lennane, S., & Cook, T. M. (2020). Deaths in healthcare workers due to COVID-19: The need for robust data and analysis. *Anaesthesia*, 75(8), 989–992. <https://doi.org/10.1111/anae.15116>
- Lanz, J. J. (2020). Evidence-based resilience intervention for nursing students: A randomized controlled pilot trial. *International Journal of Applied Positive Psychology*, 5(3), 217–230. <https://doi.org/10.1007/s41042-020-00034-8>
- Laschinger, H. K. S., & Grau, A. L. (2012). The influence of personal dispositional factors and organizational resources on workplace violence, burnout, and health outcomes in new graduate nurses: A cross-sectional study. *International Journal of Nursing Studies*, 49(3), 282–291. <https://doi.org/10.1016/j.ijnurstu.2011.09.004>
- Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist*, 46(8), 819–834. <https://doi.org/10.1037/0003-066X.46.8.819>
- Lekan, D. A., Ward, T. D., & Elliott, A. A. (2018). Resilience in baccalaureate nursing students: An exploration. *Journal of Psychosocial Nursing and Mental Health Services*, 56(7), 46–55. <https://doi.org/10.3928/02793695-20180619-06>
- Li, Z.-S., & Hasson, F. (2020). Resilience, stress, and psychological well-being in nursing students: A systematic review. *Nurse Education Today*, 90, <https://doi.org/10.1016/j.nedt.2020.104440>
- MacDonald, K., Paterson, K., & Wallar, J. (2016). Nursing students' experience of practice placements. *Nursing Standard*, 31(10), 44–50. <https://doi.org/10.7748/ns.2016.e10230>
- Masten, A. S. (2018). Resilience theory and research on children and families: Past, present, and promise. *Journal of Family Theory & Review*, 10(1), 12–31. <https://doi.org/10.1111/jftr.12255>
- Mitchell, A. E. P. (2018). Psychological distress in student nurses undertaking an educational program with professional registration as a nurse: Their perceived barriers and facilitators in seeking psychological support. *Journal of Psychiatric and Mental Health Nursing*, 25(4), 258–269. <https://doi.org/10.1111/jpm.12459>
- Nair, N., Taylor, Z. E., Evich, C. D., & Jones, B. L. (2020). Relations of positive parenting, effortful control, and resilience in rural Midwestern Latinx early adolescents. *Children and Youth Services Review*, 113, <https://doi.org/10.1016/j.childyouth.2020.105003>
- Niitsu, K., Rice, M. J., Houfek, J. F., Kupzyk, K. A., Barron, C. R., & Stoltenberg, S. F. (2019). A systematic review of genetic influence on psychological resilience. *Biological Research for Nursing*, 21(1), 61–71. <https://doi.org/10.1177/1099800418800396>
- Patel, V., Simunyu, E., Gwanzura, F., Lewis, G., & Mann, A. (1997). The Shona symptom questionnaire: The development of an indigenous measure of common mental disorders in Harare. *Acta Psychiatrica Scandinavica*, 95(6), 469–475. <https://doi.org/10.1111/j.1600-0447.1997.tb10134.x>
- Pitt, V., Powis, D., Levett-Jones, T., & Hunter, S. (2014). Nursing students' personal qualities: A descriptive study. *Nurse Education Today*, 34(9), 1196–1200. <https://doi.org/10.1016/j.nedt.2014.05.004>
- Prochnow, T., Umstattd Meyer, M. R., Oglesby, L., & Patterson, M. S. (2020). Perceived burnout and coping strategies among fitness instructors: A mixed methods approach. *Managing Sport and Leisure*, 1–15. <https://doi.org/10.1080/23750472.2020.1825986>
- Reeve, K. L., Shumaker, C. J., Yearwood, E. L., Crowell, N. A., & Riley, J. B. (2013). Perceived stress and social support in undergraduate nursing students' educational experiences. *Nurse Education Today*, 33(4), 419–424. <https://doi.org/10.1016/j.nedt.2012.11.009>
- Reverté-Villarroya, S., Ortega, L., Lavedán, A., Masot, O., Burjalés-Martí, M. D., Ballester-Ferrando, D., Fuentes-Pumarola, C., & Botigué, T. (2021). The influence of COVID-19 on the mental health of final-year nursing students: Comparing the situation before and during the pandemic. *International Journal of Mental Health Nursing*, 30(3), 694–702. <https://doi.org/10.1111/inm.12827>
- Reyes, A. T., Andrusyszyn, M.-A., Iwaswi, C., Forchuk, C., & Babenko-Mould, Y. (2015). Resilience in nursing education: An integrative review. *Journal of Nursing Education*, 54(8), 438–444. <https://doi.org/10.3928/01484834-20150717-03>
- Ríos-Risquez, M. I., Carrillo-García, E. D. L. A., Sabuco-Tebar, C., García-Izquierdo, M., & Martínez-Roche, M. E. (2016). An exploratory study of the relationship between resilience, academic burnout and psychological health in nursing students. *Contemporary Nurse*, 52(4), 430–439. <https://doi.org/10.1080/10376178.2016.1213648>
- Ríos-Risquez, M. I., Sabuco-Tebar, E. D. L. A., Carrillo-García, C., García-Izquierdo, M., & Solano-Ruiz, C. (2018). Connections between academic burnout, resilience, and psychological well-being in nursing students: A longitudinal study. *Journal of Advanced Nursing*, 74(12), 2777–2784. <https://doi.org/10.1111/jan.13794>
- Sanderson, B., & Brewer, M. (2017). What do we know about student resilience in health professional education? A scoping review of the literature. *Nurse Education Today*, 58, 65–71. <https://doi.org/10.1016/j.nedt.2017.07.018>
- Shanahan, L., Steinhoff, A., Bechtiger, L., Murray, A. L., Nivette, A., Hepp, U., Ribeaud, D., & Eisner, M. (2020). Emotional distress in young adults during the COVID-19 pandemic: Evidence of risk and resilience from a longitudinal cohort study. *Psychological Medicine*, 1–10, <https://doi.org/10.1017/S003329172000241X>
- Shanahan, L., Steinhoff, A., Bechtiger, L., Murray, A. L., Nivette, A., Hepp, U., Ribeaud, D., Smith, G. D., & Yang, F. (2017). Stress, resilience and psychological well-being in Chinese undergraduate nursing students. *Nurse Education Today*, 49, 90–95. <https://doi.org/10.1016/j.nedt.2016.10.004>
- Southwick, S. M., Bonanno, G. A., Masten, A. S., Panter-Brick, C., & Yehuda, R. (2014). Resilience definitions, theory, and challenges: Interdisciplinary perspectives. *European Journal of Psychotraumatology*, 5, <https://doi.org/10.3402/ejpt.v5.25338>
- Sperling, D. (2020). Ethical dilemmas, perceived risk, and motivation among nurses during the COVID-19 pandemic. *Nursing Ethics*, 28(1), 9–22. <https://doi.org/10.1177/0969733020956376>
- Stacey, G., & Cook, G. (2019). A scoping review exploring how the conceptualisation of resilience in nursing influences interventions aimed at increasing resilience. *International Practice Development Journal*, 9(1), 1–16. <https://doi.org/10.19043/ipdj.91.009>
- Stephens, T. M. (2013). Nursing student resilience: A concept clarification. *Nursing Forum*, 48(2), 125–133. <https://doi.org/10.1111/nuf.12015>
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. <https://doi.org/10.5116/ijme.4dfb.8dfd>
- Taylor, R., Thomas-Gregory, A., & Hofmeyer, A. (2020). Teaching empathy and resilience to undergraduate nursing students: A call to action in the context of Covid-19. *Nurse Education Today*, 94, <https://doi.org/10.1016/j.nedt.2020.104524>
- Thomas, L. J., & Revell, S. H. (2016). Resilience in nursing students: An integrative review. *Nurse Education Today*, 36, 457–462. <https://doi.org/10.1016/j.nedt.2015.10.016>
- Turner, K., & McCarthy, V. L. (2017). Stress and anxiety among nursing students: A review of intervention strategies in literature between 2009 and 2015. *Nurse Education in Practice*, 22, 21–29. <https://doi.org/10.1016/j.nepr.2016.11.002>
- Tzafir, S. S., & Dolan, S. L. (2004). Trust me: A scale for measuring manager-employee trust. *Management Research: Journal of the Iberoamerican Academy of Management*, 2(2), 115–132. <https://doi.org/10.1108/15365430480000505>
- Ungar, M. (2008). Resilience across cultures. *The British Journal of Social Work*, 38(2), 218–235. <https://doi.org/10.1093/bjsw/bcl343>
- Ungar, M. (2011). The social ecology of resilience: Addressing contextual and cultural ambiguity of a nascent construct.

- American Journal of Orthopsychiatry, 81(1), 1–17. <https://doi.org/10.1111/j.1939-0025.2010.01067.x>
- Ungar, M., & Liebenberg, L. (2011). Assessing resilience across cultures using mixed methods: Construction of the child and youth resilience measure. *Journal of Mixed Methods Research*, 5(2), 126–149. <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ924459&site=eds-live>
- Vanhove, A. J., Herian, M. N., Perez, A. L. U., Harms, P. D., & Lester, P. B. (2016). Can resilience be developed at work? A meta-analytic review of resilience-building program effectiveness. *Journal of Occupational and Organizational Psychology*, 89(2), 278–307.
- Vella, S. L. C., & Pai, N. B. (2019). A theoretical review of psychological resilience: Defining resilience and resilience research over the decades. *Archives of Medicine and Health Sciences*, 7(2), 233–239. [https://doi.org/10.4103/amhs.amhs\\_119\\_19](https://doi.org/10.4103/amhs.amhs_119_19)
- Weick, K. E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly*, 38(4), 628–652. <https://doi.org/10.2307/2393339>
- Windle, G. (2011). What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology*, 21(2), 152–169. <https://doi.org/10.1017/S0959259810000420>
- Witte, K., Meyer, G., & Martell, D. (2001). *Effective health risk messages: A step-by-step guide*. Sage.
- Yıldırım, N., Karaca, A., Cangur, S., Acikgoz, F., & Akkus, D. (2017). The relationship between educational stress, stress coping, self-esteem, social support, and health status among nursing students in Turkey: A structural equation modeling approach. *Nurse Education Today*, 48, 33–39. <https://doi.org/10.1016/j.nedt.2016.09.014>
- Zhao, F., Lei, X., He, W., Gu, Y., & Li, D. (2015). The study of perceived stress, coping strategy and self-efficacy of Chinese undergraduate nursing students in clinical practice. *International Journal of Nursing Practice*, 21(4), 401–409. <https://doi.org/10.1111/ijn.12273>

**How to cite this article:** Drach-Zahavy, A., Goldblatt, H., Admi, H., Blau, A., Ohana, I., & Itzhaki, M. (2022). A multi-level examination of nursing students' resilience in the face of the COVID-19 outbreak: A cross-sectional design. *Journal of Advanced Nursing*, 78, 109–120. <https://doi.org/10.1111/jan.14951>

The *Journal of Advanced Nursing (JAN)* is an international, peer-reviewed, scientific journal. *JAN* contributes to the advancement of evidence-based nursing, midwifery and health care by disseminating high quality research and scholarship of contemporary relevance and with potential to advance knowledge for practice, education, management or policy. *JAN* publishes research reviews, original research reports and methodological and theoretical papers.

For further information, please visit *JAN* on the Wiley Online Library website: [www.wileyonlinelibrary.com/journal/jan](http://www.wileyonlinelibrary.com/journal/jan)

#### Reasons to publish your work in *JAN*:

- High-impact forum: the world's most cited nursing journal, with an Impact Factor of 2.561 – ranked 6/123 in the 2019 ISI Journal Citation Reports © (Nursing; Social Science).
- Most read nursing journal in the world: over 3 million articles downloaded online per year and accessible in over 10,000 libraries worldwide (including over 6,000 in developing countries with free or low cost access).
- Fast and easy online submission: online submission at <http://mc.manuscriptcentral.com/jan>.
- Positive publishing experience: rapid double-blind peer review with constructive feedback.
- Rapid online publication in five weeks: average time from final manuscript arriving in production to online publication.
- Online Open: the option to pay to make your article freely and openly accessible to non-subscribers upon publication on Wiley Online Library, as well as the option to deposit the article in your own or your funding agency's preferred archive (e.g. PubMed).