Resilience among undergraduate nursing students: Findings of the first cross-sectional study in Palestine

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Abstract

Background

Resilience has emerged as a concept that could explain and predict good academic and well-being of students in stressful and traumatic situations. This study was conducted to assess resilience and identify predictors of high resilience scores among nursing students in Palestine.

Methods

This cross-sectional study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology statement. Undergraduate nursing students in all academic years were recruited and asked to complete a questionnaire the contained the trait and state resilience scales.

Results

In this study, 290 students completed the questionnaire (response rate = 92.4%). The mean combined resilience score was 134.1 (SD: 12.8). Higher combined resilience scores were predicted by being in first academic year (p -value < 0.003), living in Israeli seized areas (p -value < 0.044), absence of chronic diseases (p -value = 0.035), experiencing addiction issues (p -value = 0.031), living in a house with enough number of rooms per siblings (p -value = 0.015), and having a study routine on daily basis (p -value < 0.001).

Conclusions

Undergraduate nursing students in Palestine reported relatively high trait and state resilience. Higher resilience scores were predicted by favorable living and study conditions. More studies are still needed to investigate the relationship between resilience scores, perceived well-being, willingness to care, and future success of nursing students in Palestine.

Background

Nurses are one of the main healthcare providers in all healthcare systems around the world. In different healthcare systems, nurses provide the largest volume of healthcare services to patients who visit primary, secondary, and tertiary healthcare centers [1, 2]. Currently, there is a shortage of nurses in many healthcare systems around the globe. Therefore, nursing schools are under continuous pressure to provide quality education to nursing students who are the future workforce of nurses. Nurses as well as future nurses are hardly pressed to maintain professional standards with increasing specializations in healthcare delivery, more involvement of patients in their own healthcare, and tensions between demand and available resources [3, 4]. Globally, there is a large number of nursing students who experience struggles to complete their nursing education [3, 5].

Several studies have shown that nursing students face higher levels of academic stress compared to students in other fields of healthcare [6, 7]. During their on-site training, nursing students have to attend long training hours, witness sufferings and death of patients, and risk exposures to contagious diseases [8–10]. Additionally, nursing

students have to reconsider their personal views and values as they use new concepts and skills they acquire during training. Previous studies have shown that these situations could be highly stressful [11]. Because of their underdeveloped coping abilities and lack of experience in dealing with conflict situations, nursing students could be at higher risk for detrimental consequences of stress [12].

Jackson et al defined resilience as the ability of someone to overcome adversity, retaining a sense of control over their environments, maintaining equilibrium, and continuing to move on in a positive manner [13]. Additionally, resilience entails learning and growing stronger from accumulating experiences [14]. Resilience has emerged as a concept that could explain and predict good academic and well-being of students in stressful and traumatic situations [15]. Individuals who developed resilience typically report high self-esteem, perceived well-being, and greater flexibility in dealing with difficult situations compared to individuals with low resilience [16]. Resilience is an essential trait that practicing nurses and future nurses should possess. Previous studies investigated resilience among nursing students [3, 12, 17–19]. In a recent systematic review of 12 studies, Li and Hasson reported moderate resilience and high stress levels that caused negative psychological health outcomes among nursing students [12]. High resilience and low stress predicted well-being of the nursing students. In Hong Kong, Chow et al showed that higher resilience scores predicted perceived well-being of nursing students [18]. In another study, Van Hoek et al showed that higher resilience predicted academic success and low dropout rates among nursing students [20]. Additionally, resilience was shown to contribute to nursing students' readiness to provide care to patients [3]. It has been argued that future healthcare professionals need to be prepared to deal with emotional and physical stress experienced during their training [19]. Consistently, all studies reviewed by Li and Hasson recommended informing decision and policy makers in academia to improve resilience, well-being, and reduce stress among nursing students [12]. It has been argued that promoting resilience among nursing students can help them achieve academic success and ensures their smooth transition into their future professional practice [21]. In a systematic review with thematic synthesis, Amsrud et al qualitatively synthesized evidence on how educators can support nursing students to develop resilience [3]. The study concluded that a learning culture that is characterized by trustworthiness might promote resilience among nursing students.

Little is known on the level of resilience among undergraduate nursing students in Palestine. Assessing resilience among nursing students can inform decision and policy makers in academic to improve learning culture, well-being, academic success, and smooth transition of nursing students into their future professional practice roles. Therefore, the aims of this study were to assess resilience among undergraduate nursing students in Palestine and to identify predictors of high or low resilience among the future nurses.

Methods

Study design and setting

This study was conducted in a cross-sectional design among undergraduate nursing students in the largest and main university with a nursing program in Palestine. The study adheres to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement [22]. Adherence to the STROBE statement is shown in Supplementary Table S1.

The undergraduate nursing program in Palestine consists of 136 credit hours that can be completed in 4 academic years. Graduates are the future workforce of nurses who assume professional roles in primary, secondary, and tertiary healthcare practice.

Study population, sample size, inclusion, and exclusion criteria

The study population was undergraduate nursing students in the largest teaching university in Palestine. At the time of the study, there were approximately 1,200 students in the undergraduate nursing program. The sample size needed for this study was estimated using Daniel's formula [23]. An online sample size calculator (<http://www.raosoft.com/samplesize.html>) was used to calculate the sample size at a 95% confidence interval (CI) with a maximal margin of error of 5%. The sample size needed for this study was estimated at 292 undergraduate nursing students.

The study participants were included in this study when they met the following inclusion criteria: 1) a current student in undergraduate nursing program, 2) a current student in the largest university in Palestine, 3) willing to provide informed consent, and 4) willing to respond to items in a questionnaire. Students who were in postgraduate nursing programs and those who already completed their undergraduate nursing program were excluded from this study.

The study tool

The study tool used in this study was a questionnaire that consisted of 3 sections. The first section collected the sociodemographic, economic, and academic variables of the nursing students like gender, age, smoking status, place where the student was born and raised, where the students lived, whether the student needed to commute to the university or not, whether the student lived in a dormitory/residence or with parents, whether parents were divorced/separated, parents' level of education, whether the student lived in a family-owned house or rented house, if the house had enough room per number of siblings or not, household income, whether the student worked a part-time job or not, whether the student had a chronic disease or not, whether the student experienced addiction issues or not, academic year, grade point average (GPA), study routine, and number of hours of social media connection. The second section contained the Trait Resilience Scale (TRC) which consisted of 18 items [24, 25]. The scale was based on a three-dimensional model of trait resilience (Factor 1: I can, Factor 2: I have, and Factor 3: I am). Factor 1 measured prosocial, cognitive, interpersonal, and school functioning of the students. Factor 2 measured relationships, role models, and social support the student had. Factor 3 measured self-perception in self-regulation of the students. The students had to rate each item of the scale on a Likert-scale that had 5 options (strongly disagree to strongly agree). The third section contained the State-Resilience Scale (SRC) which consisted of 15 items [24, 25]. The scale was based on a two-dimensional model of state resilience (Factor 1: I am/I can and Factor 2: I have). The students had to rate each item of the scale on a Likert-scale that had 5 options (strongly disagree to strongly agree).

The questionnaire was assessed for face validity by 4 academicians who were also registered nurses. Before the questionnaire was used in the larger study, the questionnaire was pilot tested among 15 undergraduate nursing students. The test-retest method was used to assess stability of scores over a short period of time [26]. The nursing students were asked to complete the questionnaire. After 30 min to 2 hours, the same nursing students were asked to complete the questionnaire once again. Scores obtained in both rounds were correlated using Pearson's correlations. Stability of scores was ensured by a Pearson's coefficient (r) of > 0.80 . In this study, the Pearson's r was 0.90 which indicated excellent stability of scores. The internal consistencies of the items in the SRC and TRC were assessed using Cronbach's alpha statistics [27]. A Cronbach's alpha value of > 0.70 was considered acceptable. In this study, the 18 items in the TRC had a Cronbach's alpha of 0.78 and the 15 items in

the SRC had a Cronbach's alpha of 0.77. These values indicated that the items in both scales were internally consistent.

Data collection and analysis

The researchers approached and invited the students to participate in this study. Students who expressed willingness to provide informed consents were asked to complete the questionnaire.

Ratings collected on the 5-options Likert-scale were transformed into scores as: strongly disagree =1, disagree = 2, neutral = 3, agree = 4, and strongly agree = 5. Scores on the TRC could range from 18-90. Students were stratified into trait resilience categories based on their scores as: very low (score: 15-24), low (score: 25-34), moderate (score: 35-44), high (score: 45-54), very high (score: 55-64), and extreme (score: 65-75) [24, 25]. Scores on the SRC could range from 15-75. Students were also stratified into state resilience categories based on their scores as: very low (score: 18-29), low (score: 30-41), moderate (score: 42-53), high (score: 54-65), very high (score: 66-77), and extreme (score: 78-90) [24, 25]. On both scales, higher scores indicated higher resilience.

The data collected in this study were entered into Statistical Package for the Social Sciences version 21.0 for Windows. Absolute skewness and kurtosis were used to assess the data for normality of distribution [28]. As the absolute skewness was within the range of -2.0 and +2.0 and the absolute kurtosis was in the range of -7.0 and +7.0, the data were considered as normally distributed. In this study, the data were expressed as means with their corresponding standard deviation (SD) values. Differences in resilience scores among the nursing students were compared using Student's *t*-test. Scores were correlated using Pearson's correlations. Multiple linear regression models were used to identify predictors of higher resilience scores and to control for potentially confounding factors. In this study, the variables with a *p*-value of < 0.10 in the Student's *t*-test were retained in the regression model. Goodness-of-fit was evaluated using the adjusted R-squared with a *p*-value of < 0.05. The variance inflation factor (VIF) and tolerance values were used to ensure absence of multicollinearity problems. In this study, tolerance values were < 1 and VIF values were close to 1 which indicated absence of multicollinearity problems [29]. A *p*-value of < 0.05 indicated statistical significance.

Ethical approval

An-Najah National University's Institutional Review Board (IRB) approved this study. The study was compliant with the Declaration of Helsinki on the ethical principles for human medical research. Participation in this study was completely voluntary. All participants provided informed consent. Data were collected anonymously and no information leading to the identity of the participant was collected in this study.

Results

Study participants

In this study, 314 undergraduate nursing students were invited. Of those, 290 students completed the questionnaire, giving a response rate of 92.4%. About half of the nursing students were male and 62.4% were 20 years and older. The majority (79.7%) of the nursing students were nonsmokers, 73.8% were born and raised in the occupied Palestinian territories, and 74.8% lived in rural areas. Of the nursing students, 53.1% lived with their parents and needed to commute to the university. The vast majority (96.2%) of the students lived with their

parents who had their own family house (94.1%). Of the nursing students, 41.4% stated that the house had enough rooms per number of siblings. Of the students, 28.3% stated that their parents attended a university and were able to make some savings. About 1 in every 5 nursing students worked a part-time job, 5.2% had a chronic disease, and 3.4% experienced addiction issues. Of the students, 42.8% were in their first academic year, 61.4% had a GPA of 2 or more, 37.2% had a study routine of every day, and 7.9% stayed connected to social media 9 or more hours. Details of the sociodemographic, economic, and academic variables of the nursing students are provided in Table 1.

Resilience scores

The mean trait resilience score was 71.4 (SD: 7.5), the mean state resilience score was 62.7 (SD: 6.7), and the mean combined resilience score was 134.1 (SD: 12.8). There were significantly high positive correlations between combined resilience, trait resilience (Pearson's $r = 0.91$, $p\text{-value} < 0.001$), and state resilience (Pearson's $r = 0.89$, $p\text{-value} < 0.001$) scores. Additionally, there was a significantly moderate positive correlation between state resilience scores and trait resilience scores (Pearson's $r = 0.63$, $p\text{-value} < 0.001$). Distribution of ratings of the nursing students 18-item trait scale and 15-item state resilience scale are shown in Table 2.

The majority of the nursing students reported very high or extreme trait resilience (79.0%) and state resilience (87.6%). Distribution of the students in trait and state resilience categories is shown in Table 3.

Association between sociodemographic, economic, and academic variables of the students with resilience scores

The mean trait resilience scores were significantly higher for undergraduate nursing students who lived in Israeli seized areas, whose parents had university education, lived in a house with enough rooms per number of siblings, reported higher household income, did not have a chronic disease, were in first academic year, and reported a study routine on daily basis compared to students who lived occupied Palestinian territories ($p\text{-value} < 0.001$), whose parents did not have university education ($p\text{-value} = 0.028$), who lived in a house without enough rooms per number of siblings ($p\text{-value} = 0.003$), reported lower household income ($p\text{-value} = 0.020$), had a chronic disease ($p\text{-value} = 0.045$), were in second-fourth academic year ($p\text{-value} = 0.047$), and did not report a study routine on daily basis ($p\text{-value} = 0.001$). Associations between sociodemographic, economic, and academic variables of the students with trait resilience scores are shown in Table 4.

The mean state resilience scores were significantly higher for undergraduate nursing students who were female, Palestinians who lived in Israeli seized areas, lived in urban areas, who lived in dormitories/residence, did not have to commute to the university, reported higher household income, were in their first academic year, and reported a study routine on daily basis compared to students who were male ($p\text{-value} = 0.042$), Palestinians who lived in occupied Palestinian territories ($p\text{-value} < 0.001$), lived in rural areas ($p\text{-value} = 0.003$), who did not live in dormitories/residence ($p\text{-value} = 0.013$), had to commute to the university ($p\text{-value} = 0.009$), reported lower household income ($p\text{-value} = 0.018$), were in their second-fourth academic year ($p\text{-value} < 0.001$), and did not report a study routine on daily basis ($p\text{-value} = 0.010$). Associations between sociodemographic, economic, and academic variables of the students with state resilience scores are shown in Table 4.

The combined resilience scores were significantly higher for Palestinians undergraduate nursing students who lived in Israeli seized areas, lived in urban areas, who lived in dormitories/residence, did not have to commute to the university, lived in a house with enough rooms per number of siblings, reported higher household income, were in their first academic year, and reported a study routine on daily basis compared to students who lived occupied Palestinian territories (p-value < 0.001), lived in rural areas (p-value = 0.028), who did not live in dormitories/residence (p-value = 0.026), had to commute to the university (p-value = 0.044), reported lower household income (p-value = 0.009), were in their second-fourth academic year (p-value < 0.001), and did not report a study routine on daily basis (p-value = 0.010). Associations between sociodemographic, economic, and academic variables of the students with combined resilience scores are shown in Table 4.

The multiple linear regression models showed that higher trait resilience scores were predicted by absence of chronic diseases (p-value = 0.040), experiencing addiction issues (p-value = 0.049), living in Israeli seized areas (p-value = 0.004), living in a house with enough number of rooms per siblings (p-value = 0.033), and having a study routine on daily basis (p-value < 0.001). On the other hand, higher state resilience scores were predicted by being in first academic year (p-value < 0.001), living in urban areas (p-value = 0.042), and having a study routine on daily basis (p-value = 0.032). Higher combined resilience scores were predicted by being in first academic year (p-value < 0.003), living in Israeli seized areas (p-value < 0.044), absence of chronic diseases (p-value = 0.035), experiencing addiction issues (p-value = 0.031), living in a house with enough number of rooms per siblings (p-value = 0.015), and having a study routine on daily basis (p-value < 0.001). Multiple linear regression analyses of associations between sociodemographic, economic, and academic variables of the students with resilience scores are shown in Table 5.

Discussion

Over the past few years, there has been many calls to promote resilience among practicing and future nurses as an essential component of nurses' success and abilities to cope with clinical demands in practice [19, 30, 31]. Patients expect to receive healthcare from competent, kind, and compassionate nurses. However, when practicing and future nurses are burnt-out and exhausted, they are less likely to provide care in a compassionate manner. Resilience can be characterized as a "trait" or as a "state". Additionally, resilience can be characterized as a combination of both. In this study, trait, state, and combined resilience scores were assessed among nursing students in Palestine for the first time. In this study, nursing students showed relatively high trait, state, and combined resilience as indicated by their scores obtained on the pre-validated scales. Additionally, predictors of high and low resilience scores were also identified using multiple linear regression models. Findings of this study could be informative to decision and policy makers in academia, student, and nursing professional groups who could be interested in promoting resilience among nursing students.

In this study, the majority of the nursing students reported high prosocial, cognitive, interpersonal, and school functioning (factor 1, items: 1, 3, 8, 9, 16-18) on the TRC. Nursing students expected themselves to help others, being alert and physically active, having warm positive relationships with others, and persisting in actions until success. Findings of this study might substantiate those reported previously that trait resilience can be developed and promoted among nursing students [3, 32]. Traits of resilient individuals include dealing with others in compassionate manner, their sense of having control over their environment, proactively tackling challenges, and solution-seeking behavior in times of adversity. These traits are essential for nursing students to succeed in their academic, training, and future professional career [3, 17]. Probably, nurse educators need to help nursing students

interpret their experiences in a positive and constructive manner. This can help students develop resilience, learn from experience, grow stronger, and care for patients in a compassionate manner.

Findings of this study showed that the nursing students reported moderate to high personal relationships, role models, and social support (factor 2, items: 5-7 and 13-16). Family support and having someone to turn to in times of adversity were shown to be important in developing resilience [24, 25]. Having a pleasant personality and maintaining warm positive relationships with others could help resilient students to bounce back and carry on with life/professional activities after a time of adversity [3, 7, 12, 13, 15, 17, 19, 21, 24, 25]. During their on-site training, nursing students experience difficulties and witness sufferings and death of patients. Therefore, nurse educators should promote resilience among students to overcome adversities, consider these adversities as opportunities to learn from, grow stronger, and move on with their life/professional activities [3, 19, 33-37].

The nursing students in this study reported moderate to high healthy self-perception in self-regulation (factor 3, items: 2, 4, 10-12). Resilience students believe in themselves and often report high self-esteem, remain calm in times of adversities, learn how to handle stressful experiences, and remain optimistic in learning from difficult experiences. These traits featured in the desired traits of the resilient nurses [38-40]. Findings of this study might add to the literature reporting on resilience among future nurses.

In this study, higher trait resilience scores were predicted by living conditions, life experiences, and study routine. Students who reported higher resilience lived in larger houses, Israeli seized areas, did not experience chronic diseases, and reported a study routine on daily basis. Findings of this study were consistent with those reported in previous studies [41-43]. Probably, those students were influenced by favorable family routines and availability of more support [43]. A previous study showed that nursing students who belonged to high socioeconomic classes reported higher resilience and psychological well-being compared to nursing students of low socioeconomic classes [44]. Findings of this study might call for improving living conditions of future nurses.

The majority of the nursing students in this study reported high state resilience related to factor 1 (items: 3, 5-6, 9-13). Self-regulation and self-capacity are vital components of resilience. Similarly, the majority of the nursing students reported high state resilience related to factor 2 (items: 1-2, 4, 7-8, 14-15). Previous studies have shown that resilience among nursing students was influenced by interpersonal skills, self-regulation skills, and positive tendencies [45, 46]. It has been argued that these skills contribute to success in academic and professional life [47, 48]. Previous studies have shown that self-regulation can be improved by learning relaxation techniques like meditation, mindfulness, and guided imagery [49]. Learning to control emotions in stressful times can help nursing students develop resilience and learn from difficult experiences. During their on-site training, nursing students might encounter many stressful experiences. Therefore, learning to control their emotions, learning from experiences, and providing care with compassion would be important for their practice.

Findings of this study showed that higher state resilience scores were predicted by being in first academic year, living in urban areas, and having a study routine on daily basis. These findings indicated that favorable living and study conditions contributed to developing resilience among the nursing students in this study. However, findings of this study contradicted with a previous study in Australia in which resilience levels did not differ between junior and senior nursing students [50]. Results of this study might indicate a need to improve the living and study conditions of the nursing students.

Strengths and limitations of the study

The present study has a number of strengths and limitations that need to be considered when interpreting the findings. First, this study was the first to assess resilience among nursing students in Palestine. Findings of this study could add to the existing literature on resilience among nursing students worldwide, notably, in developing countries. Second, the study was conducted in the main university in Palestine. The university has a large number of nursing students that contribute with a significant proportion of the future workforce of nurses practicing in Palestine. Third, the sample recruited in this study was diversified in terms of representation of both gender, students in different academic years, from different regions, and socioeconomic classes. This diversity might have improved the external validity of the findings and might allow extrapolation of the findings to the entire population of nursing students in Palestine. Fourth, resilience was assessed as trait, state, and combined in this study. The tools used to assess resilience was previously validated. Additionally, the tools were revalidated in a pilot test that was conducted before the larger study to ensure the tools were valid and reliable in the study settings.

On the other hand, this study has a number of limitations. First, the sample size was relatively small. The sample size was calculated using a 90% CI. This limitation could have been avoided if the sample size was calculated using a 95% CI. Second, the nursing students were recruited from one university. Recruiting nursing students from other universities should have strengthened and improved the external validity of the findings. Third, social desirability bias cannot be ruled out in this study. As the nursing students had to rate some of their traits, some students could have overrated their traits. Fourth, we cannot rule out recall bias in this study. As the nursing students had to recall memories of the past, we cannot rule out recall bias in this study.

Findings of this study indicated that trait, state, and combined resilience can be shaped by sociodemographic, economic, and academic variables of the nursing students. Improving living and study conditions of the nursing students can improve their resilience scores and probably can improve their academic success and future transition into nursing practice. We recommend that nurse educators and other stakeholders take into planning how to support nursing students and improve their resilience.

Conclusion

In conclusion, undergraduate nursing students in Palestine reported relatively high trait, state, and combined resilience. There were significant high positive correlations between trait, state, and combined resilience scores. Higher resilience scores were predicted by favorable living and study conditions. More studies are still needed to investigate the relationship between resilience scores, perceived well-being, willingness to care, and future success of nursing students in Palestine.

Abbreviations

CI

Confidence interval

GPA

Grade point average

IRB

Institutional Review Board

SD
Standard deviation
SRC
State-Resilience Scale
STROBE
Strengthening the Reporting of Observational Studies in Epidemiology
TRC
Trait Resilience Scale

Declarations

Ethics approval and consent to participate

An-Najah National University's Institutional Review Board (IRB) approved this study. The study was compliant with the Declaration of Helsinki on the ethical principles for human medical research. Participation in this study was completely voluntary. All participants provided informed consent. Data were collected anonymously and no information leading to the identity of the participant was collected in this study.

Consent for publication

Not applicable.

Availability of data and materials

All data relevant to this work are included within the manuscript or in the additional file as supplementary materials.

Competing interests

All authors report no competing interests.

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Authors' Contributions

AA was involved in the conception and design of the work, analysis and interpretation of data, drafting and final approval the manuscript. NS, SQ, MA, and OA were involved in the data acquisition, analysis, drafting the work and final approval of the version to be published.

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Tables

Table 1: Sociodemographic, economic, and academic variables of the nursing students (n = 290)

Variable	n	%
Gender		
Male	146	50.3
Female	144	49.7
Age (years)		
< 20	109	37.6
≥ 20	181	62.4
Smoking status		
Smoker	59	20.3
Nonsmoker	231	79.7
Place where the student was born and raised		
Occupied Palestinian territories	214	73.8
Palestinians living in Israeli areas	76	26.2
Living area		
Urban	73	25.2
Rural	217	74.8
Need to commute to the university		
Yes	154	53.1
No	136	46.9
Living in a dormitory/residence		
Yes	136	46.9
No	154	53.1
Divorced/separated parents		
Yes	11	3.8
No	279	96.2
Parents' level of education		
Some school	208	71.7
University	82	28.3
Lived in a family-owned house/rented house		
Family-owned house	273	94.1
Rented house	17	5.9
The house had enough rooms per number of siblings		
No	170	58.6
Yes	120	41.4

Variable	n	%
Household income		
Enough to cover everyday life expenses	208	71.7
Able to make some savings	82	28.3
Worked a part-time job		
Yes	55	19.0
No	235	81.0
Presence of a chronic disease		
Yes	15	5.2
No	275	94.8
Experience addiction issue		
Yes	10	3.4
No	280	96.6
Academic year		
First year	124	42.8
Second year and beyond	166	57.2
Grade point average (GPA)		
< 2	112	38.6
≥ 2	178	61.4
Study routine		
Every day	108	37.2
Not every day	180	62.1
Number of hours of social media connection		
< 9	267	92.1
≥ 9	23	7.9

Table 2: Distribution of ratings of the nursing students on the 18-item trait scale and 15-item state resilience scale

Resilience	#	Item	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
			n	%	n	%	n	%	n	%	n	%
Trait	1	I am expected to be a helpful person	0	0.0	0	0.0	24	8.3	114	39.3	152	52.4
	2	I am calm even in times of difficulties	27	9.3	49	16.9	92	31.7	82	28.3	40	13.8
	3	Others see me as alert and physically active	5	1.7	12	4.1	72	24.8	138	47.6	63	21.7
	4	I believe in myself	4	1.4	7	2.4	24	8.3	87	30.0	168	57.9
	5	My parents give me much attention	5	1.7	11	3.8	51	17.6	85	29.3	138	47.6
	6	My family has high expectations of me	3	1.0	5	1.7	28	9.7	95	32.8	159	54.8
	7	When I am upset or in trouble, there is usually someone that I can turn to	25	8.6	31	10.7	76	26.2	94	32.4	64	22.1
	8	I am successful in school	1	0.3	4	1.4	26	9.0	112	38.6	147	50.7
	9	I actively do things to help others	2	0.7	10	3.4	64	22.1	115	39.7	99	34.1
	10	I feel that I understand myself	12	4.1	15	5.2	57	19.7	109	37.6	97	33.4
	11	I am exposed to stressful difficulties that I learned to handle	7	2.4	27	9.3	100	34.5	109	37.6	47	16.2
	12	I feel that things will turn out well even in difficult situations	5	1.7	12	4.1	76	26.2	131	45.2	66	22.8
	13	I know how to plan for the future	3	1.0	23	7.9	69	23.8	125	43.1	70	24.1
	14	Others usually seem happy to see me	0	0.0	3	1.0	58	20.0	126	43.4	103	35.5

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Resilience	# Item	n %	n %	n %	n %	n %
	15 My parents tell me that I am good-natured and easy-going	11 3.8	15 5.2	57 19.7	129 44.5	78 26.9
	16 I have warm positive relationships with adults	3 1.0	10 3.4	39 13.4	131 45.2	107 36.9
	17 I am persistent in my actions till I succeed	1 0.3	7 2.4	70 24.1	115 39.7	97 33.4
	18 I am able to figure out effective ways of dealing with problems	2 0.7	21 7.2	80 27.6	123 42.4	64 22.1
State	1 I have someone who loves me	10 3.4	5 1.7	20 6.9	57 19.7	198 68.3
	2 I have a person outside my home who I can tell about my problems or feelings	19 6.6	19 6.6	51 17.6	88 30.3	113 39.0
	3 I am praised for doing things on my own	8 2.8	7 2.4	43 14.8	122 42.1	110 37.9
	4 I can count on my family being there when needed	4 1.4	14 4.8	45 15.5	113 39.0	114 39.3
	5 I have someone who I want to be like (role model)	11 3.8	14 4.8	54 18.6	82 28.3	129 44.5
	6 I believe things will turn out alright	4 1.4	9 3.1	51 17.6	118 40.7	108 37.2
	7 I do endear things that make people like me	1 0.3	13 4.5	63 21.7	119 41.0	94 32.4
	8 I have faith in a higher being.	0 0.0	3 1.0	25 8.6	51 17.6	211 72.8

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Resilience	# Item	n %	n %	n %	n %	n %
	9 I am willing to try new things	2 0.7	2 0.7	27 9.3	106 36.6	153 52.8
	10 I like to achieve in what I do	2 0.7	3 1.0	23 7.9	90 31.0	172 59.3
	11 I feel that what I do makes a difference in how things turn out	0 0.0	9 3.1	50 17.2	128 44.1	103 35.5
	12 I like myself	7 2.4	7 2.4	37 12.8	111 38.3	128 44.1
	13 I can focus on a task and stay with it	2 0.7	13 4.5	60 20.7	121 41.7	94 32.4
	14 I have a sense of humor	3 1.0	13 4.5	52 17.9	115 39.7	107 36.9
	15 I make plans to do things	4 1.4	21 7.2	41 14.1	108 37.2	116 40.0

Table 3: Distribution of the students in trait and state resilience categories

Resilience	Category	n	%
Trait	Very low (score: 15-24)	0	0.0
	Low (score: 25-34)	0	0.0
	Moderate (score: 35-44)	5	1.7
	High (score: 45-54)	56	19.3
	Very high (score: 55-64)	165	56.9
	Extreme (score: 65-75)	64	22.1
State	Very low (score: 18-29)	0	0.0
	Low (score: 30-41)	0	0.0
	Moderate (score: 42-53)	3	1.0
	High (score: 54-65)	33	11.4
	Very high (score: 66-77)	131	45.2
	Extreme (score: 78-90)	123	42.4

Table 4: Association between sociodemographic, economic, and academic variables of the students with state and trait resilience scores

			Trait resilience score			State resilience score			Combined resilience score		
Variable	n	%	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value
Gender											
Male	146	50.3	71.5	7.7	0.737	61.9	7.0	0.042	133.4	13.1	0.392
Female	144	49.7	71.2	7.4		63.5	6.2		134.7	12.5	
Age (years)											
≥ 20	109	37.6	71.1	7.0	0.554	63.4	6.8	0.159	134.4	12.6	0.701
< 20	181	62.4	71.6	7.9		62.2	6.6		133.8	13.0	
Smoking status											
Smoker	59	20.3	72.3	8.1	0.307	63.1	7.4	0.619	135.3	14.1	0.390
Nonsmoker	231	79.7	71.2	7.4		62.6	6.5		133.7	12.5	
Place where the student was born and raised											
Occupied Palestinian territories	214	73.8	70.2	7.6	<0.001	61.8	6.5	<0.001	132.0	12.6	<0.001
Palestinians living in Israeli areas	76	26.2	74.7	6.3		65.1	6.6		139.9	11.5	
Living area											
Urban	73	25.2	72.2	7.7	0.280	64.7	6.1	0.003	136.9	12.2	0.028
Rural	217	74.8	71.1	7.5		62.0	6.7		133.1	12.9	
Need to commute to the university											
Yes	154	53.1	70.9	7.6	0.265	61.7	6.5	0.009	132.6	12.7	0.044
No	136	46.9	71.9	7.5		63.8	6.7		135.7	12.8	
Living in a dormitory/residence											
Yes	136	46.9	72.1	7.2	0.113	63.7	6.7	0.013	135.8	12.5	0.026
No	154	53.1	70.7	7.8		61.8	6.5		132.5	12.9	
Divorced/separated parents											
Yes	11	3.8	68.5	7.7	0.188	61.5	8.6	0.571	130.0	16.0	0.285

			Trait resilience score			State resilience score			Combined resilience score		
Variable	n	%	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value
No	279	96.2	71.5	7.5	0.028	62.7	6.6	0.900	134.2	12.7	0.175
Parents' level of education											
School	208	71.7	70.8	7.3		62.6	6.8		133.4	12.8	
University	82	28.3	72.9	7.9		62.7	6.4		135.7	12.8	
Lived in a family-owned house/rented house					0.851			0.802			0.984
Family-owned house	273	94.1	71.4	7.5		62.6	6.6		134.1	12.7	
Rented house	17	5.9	71.1	8.4		63.1	7.9		134.1	15.1	
The house had enough rooms per number of siblings					0.003			0.067			0.007
No	170	58.6	70.3	7.6		62.1	6.6		132.3	12.9	
Yes	120	41.4	73.0	7.1		63.5	6.6		136.5	12.4	
Household income					0.020			0.018			0.009
Enough to cover everyday life expenses	208	71.7	70.8	7.6		62.1	6.7		132.8	13.1	
Able to make some savings	82	28.3	73.0	7.2		64.1	6.2		137.2	11.5	
Worked a part-time job					0.174			0.401			0.216
Yes	55	19.0	72.6	7.6		63.3	6.6		136.0	12.9	
No	235	81.0	71.1	7.5		62.5	6.7		133.6	12.8	
Presence of a chronic disease					0.045			0.233			0.072
Yes	15	5.2	67.6	11.1		60.7	8.0		128.3	17.2	
No	275	94.8	71.6	7.3		62.8	6.6		134.4	12.5	

			Trait resilience score			State resilience score			Combined resilience score								
Variable	n	%	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value						
Experience addiction issue			0.054			0.281			0.090								
Yes	10	3.4										75.9	7.2	64.9	7.6	140.8	12.3
No	280	96.6										71.2	7.5	62.6	6.6	133.8	12.8
Academic year			0.047			<0.001			<0.001								
First year	124	42.8										72.4	7.1	65.1	6.3	137.5	12.2
Second year and beyond	166	57.2										70.6	7.8	60.9	6.4	131.5	12.7
Grade point average (GPA)			0.291			0.454			0.817								
≥ 2	112	38.6										70.8	7.2	63.0	7.3	133.8	13.6
< 2	178	61.4										71.8	7.7	62.4	6.2	134.2	12.3
Study routine			0.001			0.010			0.010								
Every day	108	37.2										73.2	7.5	64.0	6.5	137.2	12.8
Not every day	180	62.1										70.3	7.4	61.9	6.7	132.2	12.5
Number of hours of social media connection			0.166			0.633			0.572								
≥ 9	267	92.1										71.6	7.5	62.6	6.7	134.2	12.9
< 9	23	7.9										69.3	8.2	63.3	6.6	132.6	12.3

Table 5: Multiple linear regression of associations between sociodemographic, economic, and academic variables of the students with state and trait resilience scores

Resilience	Variable	Unstandardized Coefficients	SE	Standardized Coefficients	t	p-value
Trait	Academic year	-0.85	0.90	-0.06	-0.95	0.345
	Presence of a chronic disease	3.91	1.89	0.12	2.06	0.040
	Experience addiction issue	-4.65	2.35	-0.11	-1.98	0.049
	Divorced/separated parents	0.89	2.21	0.02	0.40	0.688
	Living in a dormitory/residence	0.27	1.06	0.02	0.26	0.797
	Worked a part-time job	-1.44	1.06	-0.08	-1.35	0.179
	Place where the student was born and raised	3.82	1.30	0.22	2.95	0.004
	The house had enough rooms per number of siblings	1.96	0.91	0.13	2.15	0.033
	Number of hours of social media connection	-0.27	1.59	-0.01	-0.17	0.867
	Study routine	-3.18	0.89	-0.20	-3.59	<0.001
	Parents' level of education	0.29	0.52	0.03	0.55	0.582
	Household income	0.21	1.05	0.01	0.20	0.845
State	Gender	0.18	0.78	0.01	0.23	0.818
	Academic year	-3.56	0.81	-0.26	-4.42	<0.001
	Need to commute to the university	0.64	1.25	0.05	0.51	0.607
	Living in a dormitory/residence	0.08	1.33	0.01	0.06	0.951
	Place where the student was born and raised	0.86	1.17	0.06	0.73	0.463
	Living area	-1.87	0.91	-0.12	-2.04	0.042
	Study routine	-1.67	0.77	-0.12	-2.15	0.032
	The house had enough rooms per number of siblings	1.41	0.79	0.10	1.79	0.075
	Household income	0.36	0.92	0.02	0.39	0.699
Combined	Academic year	-4.62	1.52	-0.18	-3.04	0.003
	Place where the student was born and raised	4.53	2.24	0.16	2.02	0.044

Resilience	Variable	Unstandardized Coefficients	SE	Standardized Coefficients	t	p-value
	Presence of a chronic disease	6.73	3.18	0.12	2.12	0.035
	Experience addiction issue	-8.55	3.95	-0.12	-2.17	0.031
	Living area	-1.52	1.74	-0.05	-0.87	0.383
	The house had enough rooms per number of siblings	3.69	1.51	0.14	2.44	0.015
	Need to commute to the university	0.36	2.40	0.01	0.15	0.881
	Living in a dormitory/residence	-0.14	2.53	-0.01	-0.06	0.955
	Study routine	-4.88	1.48	-0.18	-3.31	0.001
	Household income	0.40	1.76	0.01	0.23	0.820

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