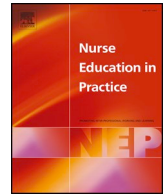




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Original research

Anxiety and coping strategies among nursing students during the covid-19 pandemic

Bella Savitsky*, Yifat Findling, Anat Erel, Tova Hendel

Ashkelon Academic College, School of Health Sciences, Ashkelon, Yitshak Ben Zvi 12, Israel

ARTICLE INFO

Keywords:
 Covid-19
 Coronavirus disease 2019
 Pandemic
 Nursing students
 Anxiety

ABSTRACT

Anxiety is highly prevalent among nursing students even in normal circumstances. In Israel during the covid-19 pandemic and mandatory lockdown, nursing students encountered a new reality of economic uncertainty, fear of infection, challenges of distance education, lack of personal protection equipment (PPE) at work etc. The objective of this study was to assess levels of anxiety and ways of coping among nursing students in the Ashkelon Academic College, Southern District, Israel.

A cross-sectional study was conducted among all 244 students in the nursing department during the third week of a national lockdown. Anxiety level was assessed using the Generalized Anxiety Disorder 7-Item Scale with a cut-off point of 10 for moderate and of 15 for severe anxiety. Factor analysis was used to identify coping components. The prevalence of moderate and severe anxiety was 42.8% and 13.1% respectively. Gender, lack of PPE, and fear of infection were significantly associated with a higher anxiety score. Stronger resilience and usage of humor were associated with significantly lower anxiety levels, while mental disengagement with higher anxiety levels.

The nursing department's staff may contribute in lowering student anxiety by maintaining a stable educational framework, providing high quality distant teaching and encouraging and supporting students through this challenging period.

1. Introduction

At the time of writing (April 06, 2020), the small state of Israel (population 9,136,000 residents (Central Bureau of Statistics, 2020) is in a state of lockdown with 8611 verified cases of covid-19, 332 of them moderately or critically ill, and 106 patients on ventilators (Weizman Institute of Science, 2020). Israel is a country used to battles and medical professionals have always been in the forefront, supporting those on the battlefield. However, this battle is different and the medical professionals have become the commanders and the foot soldiers. In the light of this situation, it was decided to examine the anxiety of nursing students in these unusual times.

Anxiety is highly prevalent among college students. The top three concerns among students are academic performance, pressure to succeed, and post-graduation plans (Beiter et al., 2015). Nursing education has consistently been associated with anxiety among students. Heavy course loads, stringent examinations, continued pressure to attain a high grade point average (Chernomas and Shapiro, 2013), complex interpersonal relationships, challenges of the clinical environment (Chen et al., 2015), caring for chronic and terminally ill patients

(Sancar et al., 2018) result in greater anxiety among nursing students than among students from any of the other healthcare disciplines. Furthermore, it has been found that the clinical training taking place during nursing education is more stressful than the theoretical aspect (Labrague, 2013; John and Al-Sawad, 2015). Anxiety has a negative effect on the quality of students' life, their education and clinical practice (Sanad, 2019) and may cause drop out from the nursing program (Rafati et al., 2017).

During an epidemic/pandemic state, nursing students are exposed to additional stressful factors, such as fear of being infected. A study conducted among nursing students during the SARS outbreak (2003) in Hong-Kong showed that nursing students perceived themselves to be at higher risk of infection (Wong et al., 2004). Similarly, in a study from Saudi-Arabia during the MERS outbreak (2016), healthcare students expressed their reluctance to work in healthcare facilities with inadequate MERS infection control isolation policies (Elrggal et al., 2018). Higher stress level during the MERS outbreak in South Korea was found to be negatively associated with intention to provide care for patients with a newly emerging infectious disease in the future (Oh et al., 2017). Coping with anxiety and stress is extremely important

* Corresponding author.

E-mail addresses: savitskyb@gmail.com (B. Savitsky), yifat.f12@gmail.com (Y. Findling), anatereli1953@gmail.com (A. Erel), tdhendel@smile.net.il (T. Hendel).

regarding the influence anxiety and stress will have on health. During the SARS outbreak in 2003 in Taiwan, nurses involved with the care of SARS patients suffered from a high incidence of depression (39%), insomnia (37%), and post-traumatic stress (33%), while a positive attitude toward taking care of patients with SARS was a protective factor against acute stress (Su et al., 2007). The latest research studying coping strategies of nurses and nursing students during the covid-19 pandemic in China has shown that nurses used problem-focused coping methods more than nursing college students who choose immature or negative coping strategies (Huang et al., 2020).

In Israel during the covid-19 pandemic, a state-wide mandatory closure of all institutions of learning, universities, colleges, schools and kindergartens was imposed from the beginning of March 2020 and an isolation policy was introduced by the government. Only 30% of workers in both public and private sectors were allowed to continue to work (others either continued to work from home, received unpaid leave or were fired). In addition, the government mandated that all citizens had to stay within 100 m of their home if they went out for sport, dog-walking, etc. which made it problematic to perform the most basic chores and religious activities. All stores were closed except for grocery stores, supermarkets and pharmacies.

The staff of all academic institutions faced a new reality had to turn to online teaching with the aim of continuing the academic year and trying to carry out end-of-semester exams as usual. Staff members started to practice and use remote teaching strategies almost immediately with the college lockdown. Meanwhile students working for payment in healthcare facilities (outside of the curriculum framework) continued to work in the new reality of uncertain conditions and controversial information in relation to the new virus and often with lack of sufficient personal protection equipment (PPE). Due to labor shortages in hospitals and in the community, the Ministry of Health's Office of the Director of Nursing asked all nursing students in the country to voluntarily agree to work in the hospitals and community settings. As a result, more than 1600 nursing students (100 from the nursing department of Ashkelon Academic College [41%]) answered the call.

The objective of this study was to assess level of anxiety and ways of coping during the period of covid-19 pandemic and identify association of coping strategies with characteristics of the students among nursing students in the Ashkelon Academic College, Southern District, Israel.

2. Methods

2.1. Study design

A cross-sectional study was conducted **during the third week of the lockdown** among all students in the nursing department (244 students), first to fourth year of study. The questionnaire was conducted using Google Forms and a request to participate in the study was sent to all students. The study received approval from the Ethical Board of the Department of Nursing. The questionnaire was anonymous (demographic questions were asked but did not include identification details). Filling out the questionnaire reflected consent to participate.

2.2. Study population

The total response rate was 88% (215 out of 244 students-93% among the students of the first year, 95% among the second year students, 82% among the third year students and 80% among the students of the fourth, final year of studies).

2.3. Study variables

The questionnaire included demographic information on students including gender, age, year of the study, family status, ethnic group, country of birth, level of religiosity and employment status (among students who worked for a salary).

Age was used as a continuous variable and as a dummy variable with the median as the cut-off point (25 years).

Gender: Female; Male.

Family status (two categories): Married/in relationship; Single/divorced.

Parental status (two categories): does not have children; has children.

Country of birth (categorical variables with two categories): Israel, other countries.

Population group: Jewish; Muslims (including Bedouins); Christians.

Level of religiosity (categorical variable with three categories): secular; traditional and religious.

Occupational status (categorical variable with three categories): salaried work in healthcare facilities; work in unrelated to the nursing field; does not work.

The questionnaire included assessment of anxiety level (see Appendix 1).

Anxiety level was assessed using The Generalized Anxiety Disorder 7-Item Scale (GAD-7) (Löwe et al., 2008). GAD-7 was used with a suggested cut-off point of 10 for defining moderate anxiety and with a cut-off point of 15 for defining severe anxiety. This questionnaire has been widely used and is reported to have high internal consistency and good test-retest reliability among adults (Zhong et al., 2015; Rutter and Brown, 2017), adolescents (Spitzer et al., 2006) and college students (Bártolo et al., 2017). In a previous study at a cut point of 10 or greater, sensitivity and specificity exceeded 0.80 (Spitzer et al., 2006).

The internal consistency of the questionnaire was validated in this study using the Cronbach's Alpha (CA). CA was found 0.93 for the total sample, pointing to high internal consistency.

For defining coping strategies eight items from the Coping Behavior Questionnaire (COPE) (Carver and Scheier, 1989) were used with an additional three items to adapt the questionnaire to the current stressors. In addition, the questionnaire included four items for resilience/self-esteem assessment (Connor and Davidson, 2003) (see Appendix 2).

2.4. Statistical analysis

The differences in anxiety score were assessed with Mann-Whitney and Kruskal-Wallis non-parametric tests. The differences in frequency of the moderate and severe anxiety disorder by demographic subgroups was checked with chi-square test.

2.5. Factor analysis

Scores characterizing coping strategies were constructed using factor analysis with varimax rotation and an unrestricted number of factors. Variables with factor loadings ≥ 0.5 were considered contributing variables to a given factor. Five factors were created and together explained approximately 60% of the variability (Table 1).

The first factor, referred to as "**Factor of Resilience**" explained 19.2% of the variance. With an increase in resilience of the students and their capability of dealing with challenges, this factor increased.

The second factor, referred to as "**Factor of Seeking Information and Consultation**" explained 13.1% of the variance. This factor increased with escalation of seeking information and using consultations with professionals about the situation by the student.

The third factor, referred to as "**Factor of Mental Disengagement**" explained 9.9% of the variance. With an increase of usage of the coping strategies such as eating, consuming sedative drugs and alcohol, this factor increased.

The fourth factor, referred to as "**Factor of Spiritual and not Scientific Sources of Support**" explained 9.8% of the variance. With an increase of belief in God and usage of social networks to get information, this factor increased.

The last fifth factor, referred to as "**Factor of Humor**" explained 8.1% of the variance. With an increase of usage of humor to deal with

Table 1
Loading coefficients of factors obtained by factor analysis.

| | Factor I 19.2% | Factor II 13.1% | Factor III 9.9% | Factor IV 9.8% | Factor V 8.1% |
|---|--|---|--|--|---|
| Resilience | | Seeking information and Consultation | Mental Disengagement | Spiritual and not Scientific Sources of Support | Humor |
| I can stay focused under pressure 0.82 | I try to get advice from someone about what to do 0.78 | I eat more than usual to calm myself down 0.79 | When I have a question about the situation, I use social networks to get information 0.74 | When I have a question about the situation, I use social networks to get information 0.74 | I enjoy the jokes about the situation 0.85 |
| I can adjust to the situation and deal with the changes 0.75 | When I have a question about the situation, I search for information 0.67 | I use alcohol or sedatives to feel better 0.72 | I put my trust in God 0.72 | I put my trust in God 0.72 | |
| Believing that coping with stress can strengthen me 0.72 | When I have a question about the condition, I use professional sources (articles or medical articles) to get information 0.57 | | | | |
| Perceive myself as a strong personality 0.72 | | | | | |

Table 2
Demographic characteristics of students.

| Demographic characteristics | First year n = 65 | Second year n = 61 | Third year n = 50 | Fourth year n = 40 |
|--|----------------------|-----------------------|----------------------|-----------------------|
| Age, years^a | 23.4 (2.8) | 25.1 (2.3) | 26.1 (3.0) | 27.9 (3.4) |
| Gender^b | | | | |
| Female | 89.2 | 86.4 | 90.0 | 85.0 |
| Male | 10.8 | 13.6 | 10.0 | 15.0 |
| Family status(married or living with the partner)^b | 21.5 | 28.3 | 66.0 | 50.0 |
| Parental status (has children)^b | 7.7 | 10.0 | 16.0 | 25.0 |
| Birth Country^b | | | | |
| Israel | 87.7 | 75.0 | 82.0 | 77.5 |
| Other ^c | 12.3 | 25.0 | 18.0 | 22.5 |
| Population group^b | | | | |
| Jewish | 80.0 | 83.3 | 96.0 | 85.0 |
| Muslims (Arabs and Bedouins) | 15.4 | 5.0 | - | 2.5 |
| Christians | 4.6 | 11.7 | 4.0 | 12.5 |
| Level of religiosity^b | | | | |
| Secular | 35.0 | 56.7 | 44.0 | 45.0 |
| Traditional | 23.3 | 16.7 | 14.0 | 32.5 |
| Religious | 41.7 | 26.7 | 42.0 | 22.5 |
| Occupational status^b | | | | |
| Works as a student with payment in the healthcare facilities | 6.2 ^d | 10.0 ^d | 8.0 | 30.0 |
| Works unrelated to nursing field | 53.8 | 61.7 | 66.0 | 42.5 |
| Does not work | 40.0 | 28.3 | 26.0 | 27.5 |

^a Mean (SD).
^b n (% of students of this year).
^c 37 out of 41 immigrants came from Former Soviet Union (FSU).
^d Magen David Adom (Israel Red Cross Ambulance Service).

the situation, this factor increased.

After designating the factors, a *t*-test or ANOVA test were used to check the association between each factor and demographic variables and a logistic regression model to investigate the associations of each factor simultaneously and after adjustment for gender with moderate and severe anxiety.

Statistical analyses were performed with SPSS statistical software version 25.0. For all analyses performed, a value of *p* < 0.05 was considered statistically significant.

3. Results

3.1. Demographic and occupational characteristics of the study population

The demographic characteristics of the study population are presented in **Table 2**. The study population was slightly different by academic year: male students comprise 10% and 11% among the students of the third and the first academic year respectively, while among the students of second and fourth academic year the proportion of males was greater (14% and 15% respectively). The proportion of immigrants was the lowest among the first year students, while among the students of fourth year immigrants (mostly from FSU) comprise almost 23%. Percentage of religious students was the highest among the students of first and third year (42%) and lowest among the students of the fourth year (23%). It should be noted that each year of study sees an increase in the number of married students, students with children and students working for a salary.

Among students who work with payment in the healthcare facilities, 69% work in a hospital and 31% work in the community setting. Among students who work in healthcare facilities 50% reported that they encountered the lack of PPE at work.

Table 3
Anxiety score by students' characteristics.

| | | Mean (SD) | Median (IQR) | P value |
|-------------------------------------|---|------------------------|------------------|--------------------|
| Demographic characteristics | | | | |
| Age | ≤ 25 years | 9.6 (5.5) | 9.0 (6.0–13.0) | 0.511 ^b |
| | > 26 years | 9.1 (5.7) | 9.0 (5.0–14.0) | |
| Gender | Female | 9.7 (5.6) | 9.0 (5.25–14.0) | 0.011 ^b |
| | Male | 6.5 (5.0) | 7.0 (1.0–11.0) | |
| Family status | Married or living with apartner | 9.8 (5.3) | 8.0 (5.25–14.0) | 0.507 ^b |
| | Other | 9.0 (5.9) | 9.0 (4.0–13.0) | |
| Parentalstatus | Have children | 9.1 (5.3) | 8.0 (5.0–13.0) | 0.696 ^b |
| | Do not have children | 9.3 (5.7) | 9.0 (5.0–13.0) | |
| Birth Country | Israel | 9.3 (5.7) | 8.0 (5.0–13.0) | 0.965 ^b |
| | Other | 9.1 (5.1) | 9.0 (5.5–12.5) | |
| Population Group | Jewish | 9.3 (5.5) | 8.0 (5.0–13.0) | 0.279 ^c |
| | Muslims (Arabs and Bedouins) | 11.1 (6.1) | 11.5 (8.75–14.5) | |
| | Christians | 7.9 (6.6) | 8.0 (1.5–14.0) | |
| Level of religiosity | Secular | 9.7 (5.4) | 9.0 (6.0–14.0) | 0.113 ^c |
| | Traditional | 10.3 (6.3) | 10.0 (6.0–15.0) | |
| | Religious | 8.2 (5.2) | 8.0 (4.0–12.0) | |
| Occupational characteristics | | | | |
| Occupational status | Salaried work as a student in healthcare facilities | 9.2 (5.3) | 9.0 (5.0–13.0) | 0.988 ^c |
| | Work unrelated to nursing field | 9.2 (5.9) | 9.0 (5.0–14.0) | |
| | Does not work | 9.4 (5.4) | 8.0 (6.0–12.0) | |
| | PPE^a | Supplied at work place | 6.8 (5.0) | |
| Lack of equipment | 11.6 (4.5) | 11.0 (8.0–13.5) | | |

^a Only among students working as students with payment in the healthcare facilities.

^b p value of Mann-Whitney non-parametric test.

^c p value of Kruskal-Wallis non-parametric test.

3.2. Anxiety score by the demographic and occupational characteristics

The percentage of students with GAD-7 of 10 and above (moderate anxiety) was 42.8% (30.8% among males and 44.7% among the females, p value of X^2 test = 0.21). The percentage of students with GAD-7 of 15 and above (severe anxiety) was 13.1% (0% among males and 14.9% among the females, p value of X^2 test = 0.03). Differences in the anxiety score was assessed by students' characteristics and presented in Table 3. Males had significantly lower anxiety scores (median = 7.0, IQR:1.0–11.0) in comparison with females (median = 9.0, IQR:5.25–14.0) (p value = 0.011). None of the other demographic characteristics were found significantly associated with the anxiety score; academic year of study was not found to be associated with level of anxiety.

Lack of PPE among working students was found associated significantly with a higher anxiety score in comparison with those students who did not experience a lack of PPE at work (median = 11.0, IQR:8.0–13.5 and median = 6.0, IQR:2.5–10.0 respectively) (p value = 0.019).

Students who were more concerned with the future continuation of this academic year had a significantly higher anxiety score (median = 9, IQR:6.0–14.0) than those who were concerned at a low or moderate level (median = 7, IQR:2.0–12.0) (p value of Mann-Whitney non-parametric test = 0.024) (data is not presented in the Table).

The anxiety score increased among those students who are the parents of young children with the increase of the burden following the lack of educational frameworks for children (schools and kindergartens); parents who reported that they did not feel such a burden had a lower mean anxiety score than those who experienced an extreme burden (mean anxiety score was 6.5 [median = 6] vs. mean of 12.1 [median = 11.5], respectively [p value of Kruskal-Wallis test = 0.016] [data is not presented]).

The anxiety score was found to be positively significantly associated with dose-response relationship with fear of becoming infected (Fig. 1). The anxiety score of students who reported intense fear of infection was found to be significantly higher.

Anxiety score by reported concern regarding the risk to become infected

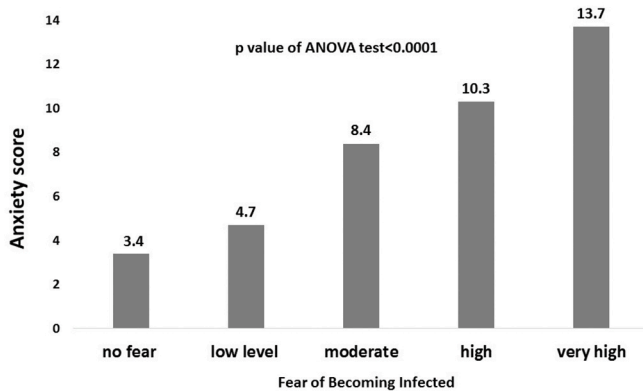


Fig. 1. Anxiety score by reported concern regarding the risk to become infected.

3.3. Students' strategies of coping

Logistic regression was used to identify the association between each of the five factors, representing coping strategies and levels of anxiety (with 10 and 15 cut-of-point respectively) as an outcome. The adjustment for gender was performed in relation to moderate anxiety only as none of males suffered from severe anxiety. Table 4 presents the role of each factor.

The factor of **Resilience** was found significantly and negatively associated with moderate and severe anxiety: among students who perceived themselves as having strong personalities, the odds for moderate and severe anxiety were significantly lower (OR = 0.569; 95% CI: 0.413–0.783 and OR = 0.478; 95% CI: 0.295–0.775 respectively). This means that elevation of one standard deviation of this factor was associated with 76% lower odds for moderate anxiety and two times lower odds for severe anxiety.

The factor of **Mental Disengagement** was found to be significantly associated with moderate and severe anxiety. The odds for moderate and severe anxiety were higher among students who reported alcohol

Table 4
The multivariate logistic regression model for predicting moderate and severe anxiety.

| Factors | OR ^a [Confidence Interval (95%)] | |
|--|---|----------------------------|
| | Moderate anxiety (43%) | Severe anxiety (13%) |
| Factor of Resilience | 0.569 [0.413–0.783] | 0.478 [0.295–0.775] |
| Factor of Seeking Information and Consultation | 1.317 [0.967–1.793] | 1.363 [0.864–2.152] |
| Factor of Mental Disengagement | 2.355 [1.634–3.394] | 1.970 [1.335–2.908] |
| Factor of Spiritual and not Scientific Support | 1.061 [0.771–1.459] | 1.608 [0.980–2.637] |
| Factor of Humor | 0.834 [0.618–1.126] | 0.556 [0.358–0.865] |

^a The model included 5 Factors and was adjusted for gender.

usage, sedative drugs or excessive eating (odds for moderate anxiety were 2.4 higher and odds for severe anxiety were almost two times higher with an elevation of one standard deviation of this factor).

The factor of **Humor** was found to be associated only with severe anxiety: the more this strategy was in use, the odds for severe anxiety were almost two times lower with elevation of one SD of this factor (OR = 0.556; 95% CI: 0.358–0.865).

3.4. Coping strategies and students' characteristics (data is not presented)

Resilience (Factor I) was not significantly associated with any of demographic variables.

Seeking information and consultation (Factor II) was significantly associated with the female gender (p value of *t*-test = 0.023) and with occupational status “work as students with payment in the healthcare facilities” (p value of ANOVA test = 0.05).

Mental disengagement (Factor III) was significantly associated with family status “not married” (p value of *t*-test = 0.024), with parental status “no children” (p value of *t*-test = 0.013), and with level of religiosity “secular” (p value of ANOVA test = 0.001).

Using the coping strategy of **Spiritual and not Scientific Sources of Support** (Factor IV) was significantly associated with age ≤ 25 (p value of *t*-test = 0.005), female gender (p value of *t*-test < 0.0001), birth county “Israel” (p value of *t*-test = 0.001), population group “Muslims (Arabs and Bedouins)” (p value of ANOVA test = 0.004), religiosity levels “traditional” and “religious” p value of ANOVA test < 0.0001).

Using **Humor** (Factor V) was significantly associated with the population group “Jews” (p value of ANOVA test < 0.0001) and with religiosity level “secular” (p value of ANOVA test = 0.01).

4. Discussion

The results of this study reflects high levels of anxiety among nursing students during the continuing covid-19 pandemic. According to previous studies, even in normal circumstances students experience anxiety. Among university and college students in Hong Kong, the prevalence of moderate anxiety was 12.2% and severe anxiety was 5.8% (Lun et al., 2018); in Portugal 15.6% suffered from moderate anxiety while 8.3% suffered from severe anxiety (Bártolo et al., 2017) and in Australia 17.5% suffered from moderate anxiety (Farrer et al., 2016). Among medical students prevalence of moderate anxiety was 25% in UK, 20% in North America, 13.7% in New-Zealand and 23% in Lebanon (Quek et al., 2019).

Anxiety level among female students was usually higher than among males in previous studies (McClean and Hofmann, 2012; Lun et al., 2018; Mirón et al., 2019; Quek et al., 2019; Sanad, 2019) and was also found in this study. Given the fact that females comprise the majority of our study population of nursing students, it can explain in part high prevalence of anxiety. The authors believe that the reason for this high prevalence of anxiety is explained by the extremely exceptional living situations and conditions during the continuing covid-19 pandemic. These circumstances include social isolation, economic instability, children who need to be taken care of at home, uncertainty

about the future, challenges of remote learning, fear of getting infected and more. It was found that the anxiety score was higher as the fear of getting infected was stronger, among those who encountered the lack of PPE at work and grew with the increase of concern regarding the continuation of the current academic year.

As to the **resilience** factor, stronger resilience and self-esteem were associated with the lowest anxiety levels (moderate and severe). Our findings are consistent with the theory that people with high resilience and self-esteem presumably engage in positive, active attempts to cope with stressors (Carver and Scheier, 1989). Similar results were found among Chinese nursing students who showed that a positive coping style is significantly correlated with a higher level of self-esteem (Ni et al., 2010, 2012).

In this study **mental disengagement** (usage of alcohol, sedative drugs and excessive eating) was associated with a higher state of anxiety. Consistent with what is known about alcohol and drugs to cope with anxiety, this coping strategy is ineffective and may worsen the level of anxiety (Carver and Scheier, 1989). Maladaptive coping strategies are more likely to lead to eating disorders (Zheng et al., 2020). It still cannot be concluded whether excessive eating in this sample represented a destructive coping strategy or whether this was the result of long home quarantine. Boredom and frustration related to the lockdown may have resulted in excessive eating.

Usage of **humor** was associated in this study with lower levels of anxiety. Freud's psychodynamic viewpoint described humor as one of the strongest defense mechanisms that allow individuals to face problems and avoid negative emotions and researchers believe that humor has a stress-moderating effect (Penson et al., 2007).

Interestingly, **searching for information** was not associated with anxiety level in this study. The authors believe that in the particular case of the covid-19 pandemic, seeking for information might increase anxiety by overflow and multiple sources of information, sometimes broadcasting contradicting information.

In this study **religiosity** was not associated with a lower anxiety level (religious students had the lowest anxiety level in comparison with secular and traditional, but this difference was not statistically significant). A recent survey conducted in Israel compared the perception of corona virus as health threat among ultra-orthodox Jews vs. other Jews. Results showed that frequency of perception of corona virus as a threat by ultra-orthodox Jews was significantly lower in comparison with other Jews. The authors concluded that the threat experience is linked to the phenomenon of religious immunity - close family ties and close social support reduce the sense of threat among the ultra-Orthodox compared to other populations (aChord Center, 2020). Numerous empirical studies have found that religion assists in an individual's ability to cope with a variety of personal and collective stressors, such as illness, the loss of a child, terrorist threats and war (Bryan et al., 2016). The authors believe that because during this period living a religious lifestyle was seriously compromised following mandatory prohibitions against praying in a mosque or synagogue and using a Mikveh (Jewish ritual bath), the anxiety of religious people might increase. In addition, a religious lifestyle is associated with a higher birth rate (in this study the percentage of parents was twice as high

among religious students in comparison with the secular group). Being isolated with young children could be challenging, as indicated by higher anxiety levels among those students who are parents and reported a heavy burden following closure of schools and kindergartens.

4.1. Recommendation

The corona outbreak created a world of ambiguity, loss of control and uncertainty. The feeling of losing control is very stressful for the general population and especially for students. The faculty has an important role to create a sense of control and provide the stable educational structure for the students. Maintaining a stable educational framework, including reducing to minimum any changes in the teaching schedule, announcing information about changes as soon as possible, supplying updated information about the continuance of the academic year and exams. The policy of maximum schedule stabilization during the lockdown was successfully introduced in the nursing department. In addition, students who were parents of children got special consideration as at the same hours of their classes, their young children also needed to participate in distance learning, making it challenging, as not every family has more than one computer. These students were not obligated for synchronous participation in lectures and classes, and all lectures were recorded and supplied for them.

Online teaching workshops were delivered at the college for all lecturers to ensure high quality teaching. The students' satisfaction survey concerning the online teaching was conducted twice during the lockdown and all students' comments were taken into account. Additional lessons were added following the students' request.

Previous experience and preparedness are positively associated with the intention to provide care for patients with a newly emerging infectious disease (Oh et al., 2017). Additional effort should be made to prepare nursing students for epidemic related challenges.

5. Conclusion

Despite the limitations of the present study related to a cross-sectional design with self-reported measures, these findings add new evidence concerning anxiety among nursing students during the pandemic of covid-19. The staff of the nursing department believe that the most important way to help students during this period is to stay in continuous contact with them beyond online teaching. Students face severe anxiety related to economic uncertainty, fear for health of their families, fear of infection, the need to support and care for children, and to deal with the challenges of distance education. The main goal of the department faculty is to keep in touch with students, to encourage and support them through this challenging period, which is still far from being finished as these words are being written.

Additional research is being planned in the near future to assess whether there has been a change in the state of anxiety of the students and their use of various coping strategies to meet the challenges of the situation.

Future studies needed to suggest and to assess the methods for reducing anxiety among nursing students.

CRedit authorship contribution statement

Bella Savitsky: Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Writing - original draft. **Yifat Findling:** Data curation, Resources, Writing - review & editing. **Anat Erel:** Data curation, Resources, Writing - review & editing. **Tova Hendel:** Conceptualization, Methodology, Project administration, Resources, Writing - review & editing.

Declaration of competing interest

All authors approve that they do not have any financial and personal relationships with other people, or organizations, that could inappropriately influence (bias) this research and this manuscript.

Acknowledgments

We wish to thank Susan Holzman for her highly professional editing advices and her valuable and kind support on this project.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nepr.2020.102809>.

References

- aChord Center, 2020. The Corona epidemic and relations between ethnic groups in Israel (Hebrew). Available at: https://achord.huji.ac.il/corona_as_an_opportunity.
- Bártolo, A., et al., 2017. 'Factor structure and construct validity of the Generalized Anxiety Disorder 7-item (GAD-7) among Portuguese college students', *Cadernos de Saúde Pública*. Escola Nacional de Saúde Pública, Fundação Oswaldo Cruz 33 (9). <https://doi.org/10.1590/0102-311x00212716>.
- Beiter, R., et al., 2015. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *J. Affect. Disord.* 173, 90–96. <https://doi.org/10.1016/j.jad.2014.10.054>.
- Bryan, J.L., et al., 2016. God, can I tell you something? The effect of religious coping on the relationship between anxiety over emotional expression, anxiety, and depressive symptoms. *Psychol. Relig. Spiritual.* 8 (1), 46–53. <https://doi.org/10.1037/rel0000023>.
- Carver, C.S., Scheier, M.F., 1989. 'Assessing coping Strategies: a theoretically based approach' *J. Pers. Soc. Psychol.* 56 (2), 267–283.
- Central Bureau of Statistics, 2020. Population of Israel on the Eve of 2020. Available at: <https://www.cbs.gov.il/en/mediarelease/pages/2019/population-of-israel-on-the-eve-of-2020.aspx>.
- Chen, C.J., et al., 2015. The prevalence and related factors of depressive symptoms among junior college nursing students: a cross-sectional study. *J. Psychiatr. Ment. Health Nurs.* 22 (8), 590–598. <https://doi.org/10.1111/jpm.12252>.
- Chernomas, W.M., Shapiro, C., 2013. Stress, depression, and anxiety among undergraduate nursing students. *Int. J. Nurs. Educ. Scholarsh.* 10 (1). <https://doi.org/10.1515/ijnes-2012-0032>.
- Connor, K.M., Davidson, J.R.T., 2003. 'Development of a New Resilience Scale: the Connor-Davidson Resilience Scale (CD-RISC)', *Depression And Anxiety*, vol. 18. John Wiley & Sons, Ltd, pp. 76–82. <https://doi.org/10.1002/da.10113>.
- Elrggal, M.E., et al., 2018. 'Evaluation of preparedness of healthcare student volunteers against Middle East respiratory syndrome coronavirus (MERS-CoV) in Makkah, Saudi Arabia: a cross-sectional study', *Journal of Public Health (Germany)*. *J. Publ. Health* 26 (6), 607–612. <https://doi.org/10.1007/s10389-018-0917-5>.
- Farrer, L.M., et al., 2016. Demographic and psychosocial predictors of major depression and generalised anxiety disorder in Australian university students. *BMC Psychiatr.* 1–9. <https://doi.org/10.1186/s12888-016-0961-z>.
- Huang, L., Xu, F.M., Liu, H.R., 2020. Emotional responses and coping strategies of nurses and nursing college students during Covid-19 outbreak. medRxiv 2020. <https://doi.org/10.1101/2020.03.05.20031898>. 03.05.20031898.
- John, B., Al-Sawad, M., 2015. Perceived stress in clinical areas and emotional intelligence among baccalaureate nursing students. *J. Indian Acad. Appl. Psychol.* 41 (Special Issue 3), 75–84.
- Labrague, L.J., 2013. Stress, stressors, and stress responses of student nurses in a government nursing school. *Health Sci. J.* 7 (4), 424–435.
- Löwe, B., et al., 2008. Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. *Med. Care* 46 (3), 266–274. <https://doi.org/10.1097/MLR.0b013e318160d093>.
- Lun, K.W.C., et al., 2018. Depression and anxiety among university students in Hong Kong. *Hong Kong Med. J.* 24 (5), 466–472. <https://doi.org/10.12809/hkmj176915>.
- Mclean, C.P., Hofmann, S.G., 2012. Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *J. Psychiatr. Res.* 45 (8), 1027–1035. <https://doi.org/10.1016/j.jpsychires.2011.03.006>.
- Mirón, J., et al., 2019. 'Perceived stress, anxiety and depression among undergraduate Students: an online survey study' *J. Depress. Anxiety* 8 (1), 1–5. <https://doi.org/10.4172/2167-1044.1000330>.
- Ni, C., et al., 2010. 'Relationship between coping, self-esteem, individual factors and mental health among Chinese nursing students: a matched case-control study' *Nurse Educ. Today* 30 (4), 338–343. <https://doi.org/10.1016/j.nedt.2009.09.003>.
- Ni, C., et al., 2012. 'Chinese female nursing students' coping strategies, self-esteem and related factors in different years of school' *J. Nurs. Educ. Pract.* 2 (4), 33. <https://doi.org/10.5430/jnep.v2n4p33>.
- Oh, N., et al., 2017. Exploring nursing intention, stress, and professionalism in response to infectious disease emergencies: the experience of local public hospital nurses during the 2015 MERS outbreak in South Korea. *Elsevier. Asian Nurs. Res.*, vol. 11 (3),

- 230–236. <https://doi.org/10.1016/j.anr.2017.08.005>.
- Penson, R.T., et al., 2007. Update: laughter: the best medicine? *Richard. Oncol. Schwartz Cent. Rounds* 10 (8), 651–660. <https://doi.org/10.1634/theoncologist.10-8-651>.
- Quek, T.T., et al., 2019. 'The global prevalence of anxiety among medical Students: a meta-analysis' *Int. J. Environ. Res. Publ. Health* 16.
- Rafati, F., et al., 2017. Coping strategies of nursing students for dealing with stress in clinical setting: a qualitative study. *Electron. Physician* 9 (12), 6120–6128. <https://doi.org/10.19082/6120>.
- Rutter, L.A., Brown, T.A., 2017. Psychometric properties of the generalized anxiety disorder scale-7 (GAD-7) in outpatients with anxiety and mood disorders. *J. Psychopathol. Behav. Assess.* 39 (1), 140–146. <https://doi.org/10.1002/cncr.27633.Percutaneous>.
- Sanad, H.M., 2019. 'Stress and anxiety among junior nursing students during the initial clinical Training: a descriptive study at college of health sciences. University of Bahrain'. *Am. J. Nurs. Res.* 7 (6), 995–999. <https://doi.org/10.12691/ajnr-7-6-13>.
- Sancar, B., Yalcin, A.S., Acikgoz, I., 2018. An examination of anxiety levels of nursing students caring for patients in terminal period. *Pakistan J. Med. Sci.* 34 (1), 94–99. <https://doi.org/10.12669/pjms.341.14285>.
- Spitzer, R.L., et al., 2006. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch. Intern. Med.* 166 (10), 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>.
- Su, T.P., et al., 2007. Prevalence of psychiatric morbidity and psychological adaptation of the nurses in a structured SARS caring unit during outbreak: a prospective and periodic assessment study in Taiwan. *J. Psychiatr. Res.* 41 (1–2), 119–130. <https://doi.org/10.1016/j.jpsychires.2005.12.006>.
- Weizman Institute of Science, 2020. Covid-19 update. Available at: <https://davidson.weizmann.ac.il/online/sciencenews/התפרצות-הקורונה-עדכונים-אחרונים>.
- Wong, J.G.W.S., et al., 2004. Psychological responses to the SARS outbreak in healthcare students in Hong Kong. *Med. Teach.* 26 (7), 657–659. <https://doi.org/10.1080/01421590400006572>.
- Zheng, Z., et al., 2020. The mediating effect of coping style in the relationship between depression and disordered eating among Chinese female undergraduates. *Front. Psychol.* 10, 3011. <https://doi.org/10.3389/fpsyg.2019.03011>.
- Zhong, Q.Y., et al., 2015. Diagnostic validity of the generalized anxiety disorder - 7 (GAD-7) among pregnant women. *PloS One* 10 (4), 1–17. <https://doi.org/10.1371/journal.pone.0125096>.