

Original Article

Psychosocial and Mental Effects of Covid-19 Pandemic on Nursing Students in Turkey: A Cross-Sectional Study

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Abstract

Background: Even under normal circumstances free of crisis period, stress and anxiety are noticeably prevalent among nursing students.

Aim: The aim of the study was to examine psychosocial and mental effects of COVID-19 pandemic among nursing students.

Methodology: The sample of this cross sectional- online study consisted of 419 nursing students in a public university. The study was conducted between 11 May-30 June 2020. The data of the study was collected using Information Form and Depression-Anxiety-Stress-21 Scale (DASS-21). The study was analysed using descriptive analyses, Mann-Whitney U test, Kruskal-Wallis test and Spearman Correlation.

Results: DASS-21 Scale scores of students reveal that; mean score of stress subscale is 6.90 ± 5.07 and among 38.2%, mean score of anxiety subscale is 4.72 ± 4.45 and among 50.8%, mean score of depression subscale is 6.59 ± 5.44 and 56.3% of students manifested problems.

Conclusions: Findings of this study exhibited that half of the nursing students experienced stress, anxiety and depression relevant problems in the during of COVID-19 pandemic. These results indicate the requirement of organization of psychological support programs for nursing students during and after the pandemic.

Key Words: Nursing students, COVID-19, psychosocial effects, mental effects

Introduction

Born in China, COVID-19 first emerged in December 2019 in Wuhan city of Hubei state. In March 2020, World Health Organization labeled the disease a global pandemic (WHO, 2020). Although COVID-19 broke out at the end of 2019 it has transgressed so swiftly that in less than two months alone, it became a hot topic in our daily conversations, discussions, social media communication and causing too much anxiety as well (Banerjee, 2020). With the outbreak of

COVID-19 Turkish government enacted a set of policies with the onset of March 2020. These policies involved mandatory closure of all educational institutes nationwide and practicing distance and digital education and adopted an isolation policy that allowed only essential personnel to work in both public and private sector. Lockdowns and complete curfews were imposed and all stores except shops, groceries and pharmacies were closed down. Similar to other countries clinical training of nursing students in

Turkey was conducted online by practicing the kind of scenarios that could minimize physical contact among students or students and lecturers (Gallego-Gómez et al., 2020). Taking into account all these factors, it is detected that in addition to being an emergency case threatening physical health, COVID-19 is a unnatural trauma-related crisis that also affects mental health (Qiu et al., 2020; Kotrotsiou et al., 2021).

Due to rising threat of the pandemic, anxiety and fear of exposure to virus, constant exposure to information flow on the outbreak and its effects, recommendations/laws to stay home at longer durations, social isolation and quarantine, loosened social contact due to pandemic, changes in life conditions and professions, failed travel plans, delays/uncertainties in research/academic process, school closure, unemployment, anxiety to lose income, excessive information flow and disinformation on media, panic buying of the essential goods humans were then exposed to global hardships that could impact their psychological and mental health (Qiu et al., 2020; Wang C. et al., 2020, Wang ZH. et al. 2020b). More to that, during COVID-19 situation uncertainty in education, challenges in distance education and missing practical trainings have been additional negations weakening nursing students' mental health (Savitsky et al., 2020). Besides panic disorder, anxiety, depression and various psychological disorders were triggered (Qiu et al., 2020). Psychological effects of the pandemic and induced stress, shifts in anxiety and depression levels have been analyzed in a number of researches (Cao et al., 2020, Qiu et al., 2020, Wang ZH. et al., 2020).

Urgent research initiatives on the psychological effects of COVID-19 are monitoring and reporting the ratios of anxiety, depression and relevant mental health disorders so as to comprehend ongoing mechanisms and most importantly to identify effective interventions. On the literature review in the time this research was planned there hasn't any national study related to nursing students has yet been discovered. In this research, it was aimed to examine psychosocial and mental effects of COVID-19 pandemic on nursing students with respect to certain variables. In accordance with this objective, answers were sought for below-listed research questions:

- What are the psychosocial effects of COVID-19 among nursing students?
- What is the level of mental state at the first stage of COVID-19 pandemic among nursing students?
- What are the factors affecting mental state at the first stage of COVID-19 pandemic among nursing students?

Methods

Research Type and Duration: This research administered online via cross-sectional method was run between 11 May-30 June 2020.

Research Population and Sampling: The study population consisted of all nursing students in a public university in Eastern Turkey (n=787) during the 2019-2020 academic year. The nursing students who agreed to participate in the present study (n=419) comprised the study sample. Inclusion criteria of our research were detected such; being a nursing student in the university where the research was conducted at the time of research implementation, volunteering to participate in the research, having not any disease that could be an obstacle in completing research tests.

Data Collection Tools: In data collection; Information Form and Depression Anxiety Stress-21 Scale (DASS-21) were administered.

- **Information Form:** Upon literature review, researchers formed a 17-question survey form listing students' demographic features and integrating psychosocial effects and worries related to COVID 19 (Cao et al., 2020; Qiu et al., 2020; Wang C. et al., 2020).

- **Depression Anxiety Stress-21 Scale:** DASS-21 was designed by Lovibond and Lovibond in 1995. Turkish validity and reliability of DASS-21 was conducted in 2018 by Sarıçam. This is a 4-point Likert scale consisting of 7 questions measuring "depression, stress and anxiety dimensions". As for depression subdimension 5 points and above, for anxiety subdimension 4 points and above, for stress subdimension 8 points and above indicate presence of a problems in relevant field. In Sarıçam's research Cronbach alpha value in depression subdimension was measured as 0.87, in anxiety subdimension as 0.85, and in stress subdimension

as 0.81 (Saricam, 2018). In current research, on the other hand, Cronbach Alpha value in depression subdimension was computed as 0.89, in anxiety subdimension as 0.85 and in stress subdimension as 0.86.

Data analysis: On online platform, research data were transferred to SPSS 22 (Statistical Package for the Social Sciences) for statistical analysis. Prior to data analysis, in order to check compatibility with normal distribution, Histogram, variation coefficient, Skewness-Kurtosis coefficient, Detrended graphic and Kolmogorov Smirnov test were implemented. The data was analyzed using descriptive analyses, Mann Withney U, Kruskal Wallis H and Spearman Correlation tests. p significance value was accepted as <0.05.

Ethical Issues and Practice: Prior to conducting the research, 06.05.2020 dated 81829502.9031/35 no Ethical Committee approval was taken from the relevant university's Non-Interventional Research Ethics Board. In the stage of research data collection forms were designed online with the extension of (https://docs.google.com/forms/d/1bdU3UztvX0SojDKptk98UHHMvGWE5WN0ADUc0_Vdt4c/edit) in Google Forms and link. Invitations were sent via online social media (WhatsApp, Facebook) to potential participants. In the first part of research forms consent part was shared to inform that participants. Of all the research participants, those accepting consent part could continue to fill in the research form.

Results

Distribution of students with respect to DASS-21 Scale scores demonstrates that (Figure 1); in stress subscale mean scores are 6.90 ± 5.07 (Min:0.00, Max.:21.00) and 38.2% have a problem, in anxiety subscale mean scores are 4.72 ± 4.45 (Min:0.00, Max.:20.00) and 50.8% have a problem, in depression subscale mean scores are 6.59 ± 5.44 (Min:0.00, Max.:21.00) and 56.3% have a problem. DASS-21 results with respect to students' descriptive characteristics (Table 1) showed that; age, gender, grade, family type and place of residence in DASS-21 had not any statistically significant effect on stress, anxiety and depression subdimensions ($p > 0.05$). Those with average and bad economic status had, compared to the ones with good status, stress levels that were statistically significant high ($p < 0.05$), while in anxiety and depression subdimensions there was not any statistically significant effect ($p > 0.05$). DASS-21 results with respect to students' health and COVID-19 characteristics (Table 2) exhibited that; compared to those not having any COVID-19 diagnosed relative, students having a COVID-19 diagnosed relative displayed higher anxiety, those not contended with information gained on COVID-19 were, unlike those contended with information, scored higher stress, anxiety and depression, unlike the ones gaining information on social media on COVID-19, the ones not gaining information manifested statistically significant mean scores in stress and anxiety subdimensions ($p < 0.05$).

Figure 1. Distribution of Students with respect to DASS-21 Scale Scores

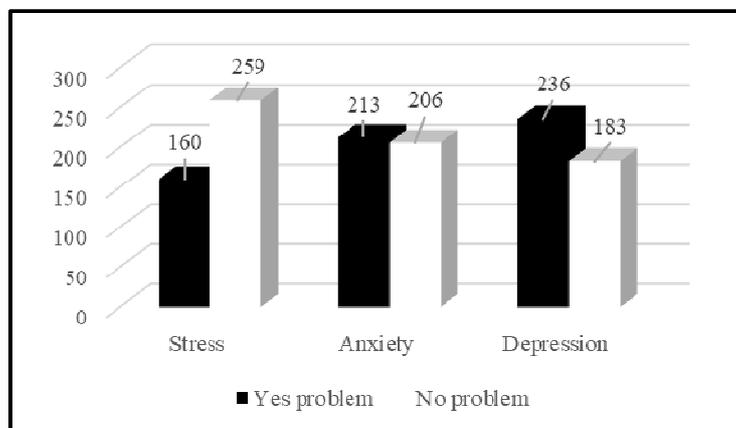


Table 1. DASS-21 Results Based on Students' Descriptive Characteristics

Scales Descriptive Characteristic	n(%)	Stress		Anxiety		Depression	
		Mean Ranks	U; χ^2 ; r; p	Mean Ranks	U; χ^2 ; r; p	Mean Ranks	U; χ^2 ; r; p
Age*	21.40±1.59	r=0.002 p= 0.959		r=0.027 p= 0.576		r=0.028 p= 0.562	
Gender							
Female	279(66.6)	212.64	U=0.632	210.44	U=0.106	207.25	U=0.657
Male	140(33.4)	204.73	p=0.527	209.12	p=0.915	215.47	p=0.511
Grade							
First grade	62(14.8)	209.69	$\chi^2=3.505$ p=0.320	208.74	$\chi^2=0.619$ p=0.892	213.90	$\chi^2=5.769$ p=0.123
Second grade	150(35.8)	212.77		211.50		211.92	
Third grade	45(10.7)	178.82		197.18		169.83	
Fourth grade	162(38.7)	216.21		212.66		217.88	
Family Type							
Nuclear	312(74.5)	211.88	U=0.545	213.12	U=0.906	214.66	U=1.349
Extended	107(25.5)	204.50	p=0.586	200.90	p=0.365	196.41	p=0.177
Place of residence							
Metropolitan	143(34.2)	210.66	$\chi^2=1.776$ p=0.411	207.35	$\chi^2=0.118$ p=0.943	210.59	$\chi^2=2.192$ p=0.334
City	161(38.4)	237.84		240.68		248.78	
Countryside	115(27.4)	198.21		212.33		196.97	
Socioeconomic status							
Good	60(14.3)	164.58	$\chi^2=9.912$ p=0.007	183.02	$\chi^2=3.646$ p=0.162	175.60	$\chi^2=5.681$ p=0.058
Average	324(77.3)	217.37		215.26		215.71	
Bad	35(8.4)	219.66		207.54		236.11	

*Spearman Correlation test was administered.

Table 2. DASS-21 Results with respect to Students' Health and COVID-19 Characteristics

Scales Characteristics	n(%)	Stress		Anxiety		Depression	
		Mean Ranks	U; χ^2 ; p	Mean Ranks	U; χ^2 ; p	Mean Ranks	U; χ^2 ; p
Presence of a Chronic Disease							
Yes	27(6.4)	199.63	U=0.461	212.35	U=0.105	221.87	U=0.528
No	392(93.6)	210.71	p= 0.645	209.84	p= 0.916	209.18	p= 0.598
COVID-19 Diagnosed Relative							
Yes	99(23.6)	221.41	U=1.075 p= 0.282	233.17	U=2.190 p= 0.028	226.24	U=1.531 p= 0.126
No	320(76.4)	206.47		Loss of COVID-19 Diagnosed Relative			

Yes	24(5.7)	186.13	U=0.997	221.88	U=0.498	213.10	U=0.130
No	395(94.3)	211.45	p= 0.319	209.28	p= 0.619	209.81	p= 0.897
Contentment with the Information gained on COVID-19							
Yes	317(75.7)	202.41	U=2.269	200.87	U=2.736	200.15	U=2.944
No	102(24.3)	233.60	p= 0.023	238.38	p= 0.006	240.62	p= 0.003
Gathering Information on COVID-19 via Social Media							
Yes	379(90.5)	205.23	U=2.487	205.02	U=2.605	206.53	U=1.811
No	40(9.5)	255.19	p= 0.013	257.18	p= 0.009	242.90	p= 0.070

Discussion

In our research, we identified that in DASS-21 Scale 38.2% of the students scored problematically high with respect to Stress subscale, 50.8% with respect to Anxiety subscale and 56.3% with respect to Depression subscale mean score range. In the study by Qiu and his colleagues (2020) it was detected that in China psychological distress was higher among young adult group (aged 18-30) and members of this age group belonged to a community with higher risk in terms of distress. In Maia and Dias' (2020) study examining effects of COVID-19 with respect to stress, anxiety and depression levels among university students, obtained findings indicated that compared to students analyzed in non-pandemic, normal days, students in their population manifested anxiety, depression and stress in a significantly higher degree. In the research of Shevlin and his colleagues (2020) conducted to unveil anxiety and depression during COVID-19 pandemic among United Kingdom population, depression ratio was measured as 22.1% and for anxiety the ratio was 21.6%. Özdin and Özdin (2020) run a research to measure anxiety, depression and health levels among Turkish society at the outbreak of COVID-19 and they concluded that 45.1% of individuals scored a point above cut-point in anxiety and 23.6% of individuals scored a point above cut-point in depression level. Presence of such epidemiological discrepancies related to mental disorders faced during COVID-19 pandemic situation can be attributed to cultural diversity, population of researches, time zone and features of utilized measurement tools.

Although contagious diseases, due to several factors, drive a myriad of emotional reactions it is also true that not every person experiences the same level of emotional effect (Khalid et al., 2016). Because of its rapid spread, strong contagious effect, cause of death in risky cases and absence of a specific drug, COVID-19 imposes an immense threat on people's mental health by causing a major danger for human life and health (Gao et al., 2020; Gallego-Gómez et al., 2020). Battle with specific contagious diseases, stressful work, insomnia, weakened freedom, major responsibility and high level of cooperation combined with constant risk of death cumulatively pose great challenge for nurses belonging to the health personnel group, constituting one of the most vulnerable groups. Among student nurses witnessing all these challenges and professional obstacles clearly during this process, there was higher increase in career anxiety throughout this process (Huang et al., 2020). Next to all these factors, since among university students there is a greater tendency to use immature or negative coping strategies instead of adopting a positive attitude once they face the pressure induced by public health related emergency cases, it is witnessed that during this process student nurses experimented greater mental challenges (Gao et al., 2020).

It was detected that among female students taking part in our research stress and anxiety scores were insignificantly higher whereas among male students depression scores were insignificantly high. At the end of Maia and Dias' (2020) studies parallel findings with our research were reported

and seen that among male students depression scores were insignificantly high whereas among female students stress and anxiety scores were insignificantly higher. Results of a study administered to examine mental effects of COVID-19 pandemic and other studies demonstrate that between women and men no difference existed with respect to anxiety (Huang and Zhao, 2020, Nemati et al., 2020) and depression (Shevlin et al., 2020). Besides, compared to men, women experienced greater level of stress (Wang C. et al., 2020a, anxiety (Acar et al., 2020; Huang et al., 2020; Moghanibashi-Mansourieh, 2020; Özdin and Özdin, 2020; Savitsky et al., 2020; Shevlin et al., 2020; Yakar et al., 2020; Wang C. et al., 2020) and depression (Özdin and Özdin, 2020; Wang ZH. et al., 2020). In our research the reasons for measuring higher stress and anxiety among women could be related to gender inequality in Turkey, passive position of women since their childhood, silencing women's voice not to share their feelings within family and as a consequence of corona-bound social isolation increased domestic burden of Turkish woman in relation to unfair share of domestic works.

In our research we identified that people whose economic status was average and bad manifested statistically significantly high stress than those with good economic status ($p < 0.05$), whilst in relation to anxiety and depression levels not a significant effect was measured ($p > 0.05$). Cao and his colleagues' study (2020) displayed that income stability of families played a protective role against anxiety symptoms. Zhi and his colleagues' (2020) China-based research among 415 nursing students evidenced that students with higher monthly expenses went through heavier psychological stress. Weak economic status could also be related to greater risk of viral infection and lower means of prevention/treatment, thereby causing much worse results for the disease.

In our research it was detected that among those having a COVID-19 diagnosed relative, anxiety scores were statistically higher while stress and depression scores were insignificantly high. In relevant studies it was detected that among people having friends or relatives diagnosed with COVID-19 positive, anxiety (Moghanibashi-Mansourieh, 2020; Yakar et al., 2020) and depression (Özdin

and Özdin, 2020) were higher. It is likely that the reason for higher anxiety among those having a COVID-19 positive relative is fear of potential contact with the infected patient earlier and also fear of the risk of losing someone loved. The closer a person is to danger the higher is experienced anxiety (Huang et al., 2020). Huang and his colleagues' study (2020) posited that as the participants come closer to COVID-19 their anxiety becomes much stronger.

In our research it was uncovered that students having gained information from social media due to COVID-19 exhibited statistically significantly lower stress and anxiety and yet insignificantly lower depression scores that caused no difference. In a pandemic situation already causing disturbance and misery among people, there is constant circulation of information pollution and fake news of Corona virus on social media. Disinformation on social media and false COVID-19 reports may aggravate mental health disorders (Kırık and Ozkocak, 2020). In our research main source of information was reported to be the Ministry of Health and Ministry's official website was used as information site; hence that could explain not being affected by the fake news circulating on social media. Added to that literature findings put forth that university students are much less affected by COVID-19 news (Gallego-Gómez et al., 2020).

Limitations: This study has some limitations. The first one is that since data provided here and related analyses were attained via a cross-sectional model it is infeasible to suggest causal implications. Secondly; as this research was administered via an online survey, there is also likelihood of selection bias. Those with no internet access and not employing online data collection tools were not included to the research. Thirdly; although sampling size is sufficient, findings in this research were collected from a university located in the East of Turkey, not representing a factual sample of random probability. And fourthly; all evaluations were based on a self-reflection report in which participants evaluated themselves personally, which in turn may have resulted a higher estimation of prevalence ratios. In the analysis of research results, it is suggested to take these limitations into account.

Conclusions and Suggestions : Results of our study presented that half of the nursing students experienced stress, anxiety and depression relevant problems after COVID-19 pandemic and findings underlined that groups having received greatest mental damage were those with average and bad economic status, those having a COVID-19 diagnosed relative, those not contended with the information gained on COVID-19 and those not using social media during COVID-19 pandemic situation. Based on the results of this research below-listed suggestions are shared to enhance psychosocial wellness of nursing students and to mitigate mental disorders as low as it can be;

- increasing social support,
- leading a life as normal as possible without forsaking safety measures,
- providing available psychosocial, psychological care and assistance services online to students,
- periodical control of students' mental health to spot those with psychological disorders,
- maintaining consistent educational framework.

References

- Acar, K., Mor, A., Baynaz, K., & Arslanoglu, E. (2020). An investigation on anxiety states of students in faculty of sport sciences during COVID-19. *Int J Disabil Sports Health Sci.*, 3 (1), 66-73.
- COVID-19. *Int J Disabil Sports Health Sci.*, 3 (1), 66-73.
- Banerjee, D. (2020). How COVID-19 is overwhelming our mental health. *Nature India*. doi:10.1038/nindia.2020 Available at: <https://www.natureasia.com/nindia/article/10.1038/nindia.2020.46>. (accessed 26 March 2020).
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., et al. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res.*, 287:112934.
- Gallego-Gómez, J.I., Campillo-Cano, M., Carrión-Martínez, A., Balanza, S., Rodríguez-González-Moro, M.T., Simonelli-Muñoz, A.J. (2020). The COVID-19 pandemic and its impact on homebound nursing students. *Int J Environ Res Public Health*. 17(20):7383.
- Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., et al. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *Plos one*, 15(4):e0231924.
- Huang, L., Lei, W., Xu, F., Liu, H., & Yu, L. (2020). Emotional responses and coping strategies in nurses and nursing students during COVID-19 outbreak: A comparative study. *PLoS One*, 15(8): e0237303.
- Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res.*, 112954.
- Khalid, I., Khalid, T.J., Qabajah, M.R., Barnard, A.G., & Qushmaq, I.A. (2016). Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. *Clinical Medicine & Research*, 14(1):7-14.
- Kotrotsiou, S., Theofanidis, D., Malliarou, M., Konstanti, Z., Sarafis, P., Tsioumanis, G., & Paralikas T. (2021) Investigating Nurses Stress Response Strategies During the COVID-19 Pandemic. *MATER SOCIO-MEDICA*, 33-3:168-173.
- Kırık, A.M., & Özkoçak, V. (2020). Within the context of new world order social media and novel Coronavirus(Covid-19) pandemic. *Journal of Academic Social Researches*, 45, 133-154.
- Liu, C.H., Zhang, E., Wong, G.T.F., & Hyun, S. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for US young adult mental health. *Psychiatry Res.*, 290:113172.
- Maia, B.R., & Dias, P.C. (2020). Ansiedade, depressão e estresse em estudantes universitários: o impacto da COVID-19. *Estudos de Psicologia (Campinas)*, 37:e200067.
- Moghanibashi-Mansourieh, A. (2020). Assessing the anxiety level of Iranian general population during COVID-19 outbreak. *Asian J Psych*. 51:102076.
- Nemati, M., Ebrahimi, B., & Nemati, F. (2020). Assessment of Iranian nurses' knowledge and anxiety toward COVID-19 during the current outbreak in Iran. *Arch Clin Infect Dis.*, 15 (COVID-19), e102848.
- Ozdin, S., & Bayrak Ozdin, S. (2020). Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: the importance of gender. *Int J Soc Psychiatry.*, 66(5):504-511.
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *Gen Psychiatry.*, 3(2):e100213.
- Sarıçam, H. (2018). The psychometric properties of Turkish version of Depression Anxiety Stress Scale-21 (DASS-21) in health control and clinical samples. *Journal of Cognitive Behavioral Psychotherapy and Research*, 7(1):19-30.

- Savitsky, B., Findling, Y., Ereli, A., & Hendel, T. (2020). Anxiety and coping strategies among nursing students during the COVID-19 pandemic. *Nurse Educ Pract.*, 46:102809.
- Shevlin, M., McBride, O., Murphy, J., Miller, J. G., Hartman, T. K., Levita, L., et al. (2020). Anxiety, depression, traumatic stress, and COVID-19 related anxiety in the UK general population during the COVID-19 pandemic. *B J Psych Open.*, 6(6),e125.
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R.S., et al. (2020). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain, Behav Immun.* 87:40-48.
- Wang, Z.H., Yang, H.L., Yang, Y.Q., Liu, D., Li, Z.H., Zhang, X.R., et al. (2020). Prevalence of anxiety and depression symptom, and the demands for psychological knowledge and interventions in college students during COVID-19 epidemic: A large cross-sectional study. *J Affect Disord.* 275:188-193.
- World Health Organization. (2020). Mental health and psychosocial considerations during the COVID-19 outbreak, 18 March 2020 (No. WHO/2019-nCoV/MentalHealth/2020.1). Available at: <https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf> . (accessed 5 April 2020).
- Yakar, B., Kaygusuz, T.Ö., Pirinçci, E., Önalın, E., & Ertekin, Y.H. (2020). Knowledge, attitude and anxiety of medical students about the current COVID-19 outbreak in Turkey. *Family Practice and Palliative Care*, 5(2):36-44.
- Zhi, X., Lu, L., Pu, Y., Meng, A., Zhao, Y., Cheng, F., et al. (2020). Investigation and analysis of psychological stress and professional identity of nursing students during COVID-19 pandemic. *Indian J Exp Biol.*, 58:426-432.