



POST TRAUMATIC GROWTH DURING COVID-19 OUTBREAK AND THE AFFECTING FACTORS: RESULTS OF A CROSS-SECTIONAL STUDY AMONG TURKISH NURSING STUDENTS

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Abstract: The aim of this study is to determine posttraumatic growth of nursing students during COVID-19 pandemic and the affecting factors. This study is a descriptive and cross-sectional study. The sample of the study consisted of 402 nursing students. The data were collected using a self-report questionnaire and Post-Traumatic Growth Inventory. The analyses showed that there was a significant difference between PTG scores of the students by variables such as gender, economic situation, smoking/alcohol use, having a chronic disease, things enjoyed during the pandemic and the situations in which individuals were most affected during the pandemic. This determination indicates that activities should be included in nursing programs to encourage the students to have more positive developments in their lives.

Keywords: COVID-19, Pandemic, Nursing students, Posttraumatic growth

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Received: September 29, 2021

Accepted: January 06, 2022

Published: May 01, 2022

Cite as: Cerit E, Kaplan V. 2022. Post traumatic growth during COVID-19 outbreak and the affecting factors: Results of a cross-sectional study among Turkish nursing students. *BSJ Health Sci*, 5(2): 199-205.

1. Introduction

COVID-19, being a medical phenomenon, has affected the whole world as a social trauma that threatens individuals and communities psychosocially. As of its emergence, this virus has created big chaos and uncertainty and caused individuals to have complexity regarding how to tackle it (Karataş, 2020). This phenomenon that has caused millions of people to get sick and die has turned out to be psychological pandemic and lead people of every age and status to have mental trauma (Dzau et al., 2020; WHO, 2020). The studies conducted have found that fear, panic, obscurity, and social restrictions applied for precaution that were caused by the pandemic lead to the emergence of many mental problems, especially depression, anxiety and post traumatic stress disorder, in individuals from all segments of the society (Brooks et al., 2020; Codagnone et al., 2020; Galea et al., 2020). In particular, health care professionals who are under serious risk and work very hard have these symptoms severely (Huang et al., 2020; Lai et al., 2020; Pan Cui et al., 2020).

During the pandemic, providing care to many infected patients at the same time, or witnessing painful death of patients frequently have been difficult processes to cope, especially for nurses who are in direct contact with patients (Pan Cui et al., 2020). In fact, the studies have found that the difficulties faced during the pandemic cause 32% of nurses to experience insomnia, 40% anxiety, 69% high stress, and 85% somatization (Huang

et al., 2020; Lai et al., 2020; Lin et al., 2020; Spoorthy, 2020; Xu and Zhang, 2020; Zhang et al., 2020). However, contrary to all these statistics, there are also studies showing that nurses experience positive growth by experiencing feelings of satisfaction and pride thanks to their success in healing and keeping the patients alive during the fight against the pandemic (El-Gabalawy et al., 2020; Yang et al., 2020). This may be related to the potential of Post traumatic growth (PTG) in nurses (Pan Cui et al., 2020; El-Gabalawy et al., 2020).

PTG is defined as positive changes in individuals as a result of struggling with highly challenging life events and an increase in the functionality level (Tedeschi and Calhoun, 1996). This development generally takes place as positive pictures such as reordering the priorities, making sense of life, improving relationships, increasing individual awareness, noticing new options, experiencing psychosocial and spiritual changes (Tedeschi and Calhoun, 1996; Tedeschi and Calhoun, 2004). The speed and potential of this development varies depending on demographic factors, effect/stress of the traumatic event, resources owned, power of social solidarity, the use of functional coping strategies and personality traits (Tedeschi and Calhoun, 1995; Tedeschi and Calhoun, 2004).

Nurses who often face traumatizing/causing crisis situations due to difficult working conditions can be considered a sensitive and special group. Such exposure,



which may accompany them throughout their professional life, enables nurses to easily adapt to traumatic situations psychologically and even create a potential for additional personal development (Chen et al., 2020; Pan Cui et al., 2020; Vazquez et al., 2020). It is vital for nursing students, being future nurses, to have such development potential regarding their professional and social lives (Li et al., 2015; Kaplan and Ançel, 2020). COVID-19, a traumatic experience, has been a devastating factor for nursing students as well as individuals from every segment of society. This pandemic, having traumatizing effect in terms of mental health, has caused serious fear, crisis and anxiety in nursing students who endeavor to control potential pandemics they may encounter after starting their professional life and to manage infected patients (Akman et al., 2020; Aslan and Pekince, 2020; Gallego-Gómez et al., 2020). In addition, suspension of educational activities (consisting of intensive theoretical knowledge and clinical practice) within the scope of protection practices has also caused serious anxiety in students and caused them to feel more unprepared for the future (Aslan and Pekince, 2020). In this sense, COVID-19, a traumatic situation, has the potential to affect personal development of nursing students as well as the care they will provide in future, and their social and professional relationships. Determination of the trauma caused by the pandemic, how it affects these components and what these negativities experienced by students will result in is of vital importance. The studies to detect how COVID-19 pandemic affects PTG levels of nursing students and what factors affect it are insufficient in the literature. The results of this study can contribute to filling this gap in the literature.

2. Material and Methods

2.1. Research Aim and Design

This descriptive and cross-sectional study was carried out in a nursing department of a health sciences faculty of a university located in a city of Turkey between 17/02/2021 and 02.03.2021. This study was aimed to determine the post-traumatic growth levels and influencing factors of nursing students during the COVID-19 outbreak.

2.2. Research Population and Sample

The study population consisted of nursing students who were in the nursing department of the university in the academic year of 2020-2021 (n=467). All the students who agreed to participate in the research were included in the study (n = 402). At the end of the study power analysis (G*Power (v3.1.9.2) was performed using in order to determine the sample size. Considering the average score Posttraumatic Growth Inventory with the average score, the power of the study was found to be 99% at alpha=0.05.

2.3. Inclusion Criteria for the Research

- The students who were continuing their education as nursing students at the university, during the

research (2020/2021 academic year),

- Who were aged 18 and above,
- Who were volunteering to participate in the study,
- Who had no disorder in their hearing, speaking, and understanding skills that could prevent them from communicating clearly in the process of filling the data obtaining tools were included in the research.

2.4. Data Collection

The data were collected using Google Form surveys that were sent to smart phones of the students to prevent transmission of any disease during quarantine of COVID-19 pandemic. The link with the forms is as follows: https://docs.google.com/forms/d/1nZjDC_4GD5mqFNS3UYLK_IQTu9rSJ7xQYIOLfHDakDE/edit

The study was conducted as cross sectional self-report questionnaire between the dates of 17/02/2021 and 02/03/2021. To conduct the study, the participants were provided with "Informed Consent Forms" at first. Later, those who agreed to take part in the study were delivered a questionnaire form consisting of personal information form and posttraumatic growth inventory. Also, they were asked to fill out the data collection forms anonymously to ensure their confidentiality.

2.5. Data Collection Tools

2.5.1. Personal information form

The form created by the researchers upon literature review (Li et al., 2019; Aslan and Pekince, 2020; Huang et al., 2020; Hamama Raz, 2020; Jonsen and Afgun, 2020; Chen et al., 2021) comprises 22 questions about the personal characteristics of the participants and their experiences during the COVID-19 process defining personal traits such as age, gender, economic status, having a chronic disease, being infected with COVID-19, the level of exposure to the disease, and alcohol use/smoking habits, the issue that needs the most support in the social isolation in pandemic.

2.5.2. Posttraumatic growth inventory (PTGI)

The study used the PTGI which was developed by Tedeschi and Calhoun (1996) and its Turkish validity and reliability study was carried out by Kağan et al. (2012). The Likert type scale scored between 0 and 5 consists of 21 items and measures post trauma growth. The scores from the scale are as follows: 0; I have never experienced this change after the stressful event(s), 1; very little, 2; somewhat, 3; at a moderate level, 4; quite much and 5; I have experienced this change to a large extent after the stressful event(s). A higher score from the scale expresses that PTG is experienced. The three subscales of PTGI are "Change in Self-Perception (CSPS)" (5, 10, 11, 12, 13, 15, 16, 17, 18, 19), "Change in Relationships with Others (CROS)" (6, 6, 8, 9, 20, 21) and "Change in Philosophy of Life (CPLS)" (1, 2, 3, 4, 7, 14). The internal consistency obtained from Turkish adaptation studies of the scale was $\alpha=0.88$ for change in self-perception, $\alpha=0.77$ for change in relationships with others and $\alpha=0.78$ for change in philosophy of life. The Cronbach's alpha value of the PTGI is 0.85, Change in Self-Perception subscale is 0.71, Change in Philosophy of Life Subscales is

0.81, Change in Relationships with Others Subscale 0.86.

2.6. Statistical Analysis

The Statistical Package for the Social Sciences-PC Version 21.0 (SPSS 21.0) was used for statistical analysis of the data. The number (n), percentage (%), mean, and standard deviation (SD) were used as descriptive statistical methods. The compliance of data to normal distribution was evaluated using the Shapiro-Wilk test and QQ graphics. The t-test was used to compare two independent groups according to distribution characteristics of the data and One-Way ANOVA was used to compare three and more independent groups.

3. Results

Descriptive characteristics of the participating students are given in Table 1. The mean age of the students was 20.65±1.69, 76.1% of them were female, and 64.9% stated that their family income was equivalent to their expenses, 90.6% did not receive psychological support from a specialist, 84.6% did not smoke, 94.3% did not use alcohol and 95.3% did not have a chronic physical disease.

Table 1. Descriptive characteristics of the students

Attributes	n	%
Age [Mean ±SD (min-max)]	20.65±1.69(17-30)	
Gender		
Female	306	76.1
Male	96	23.9
Economic Status of Family		
Less income than expense	109	27.1
Equal income to expense	261	64.9
More income than expense	32	8.0
Receiving Psychological Support		
I received during the pandemic	5	1.2
I received before the pandemic	33	8.2
No, I have not received support	364	90.6
Chronic Physical Disease		
Yes*	19	4.7
No	383	95.3
Smoking Habits		
Yes	62	15.4
No	340	84.6
Alcohol Use		
Yes	23	5.7
No	379	94.3

*Chronic diseases of the participants: asthma, diabetes, migraine, epilepsy.

The students' mean scores from PTGI and CPLS, CSPS, CROS and minimum-maximum values are shown in Table 2. The students' mean score from PTGS is 45.63±24.13, from CPLS is 14.13±7.43, from CSPS is 23.96±13.03 and from CROS is 7.53±5.68.

Attributes of the participating students for COVID-19 process are given in Table 3. A total of 61.4% of the students were diagnosed with COVID-19 as well as their

parents of the students, 41.3% experienced the most negativity during the pandemic with distance education, 35.3% thought the best thing was spending time with the family, 46% required psychological support and personality of 46.8% was negatively affected by the pandemic process.

Table 2. Score distribution of PTGI and its subscales

Scale and Subscales	X±SD (Min-Max)
PTGI	45.63±24.13 (0-105)
CPLS	14.13±7.43 (0-30)
CSPS	23.96±13.03 (0-50)
CROS	7.53±5.68 (0-25)

Table 3. Attributes of the students regarding COVID-19 pandemic

	n	%
Having COVID-19		
I, myself got sick only	12	3.0
My family got sick	77	19.2
Both myself and all family members got sick	247	61.4
Neither me nor my family got sick	66	16.4
The most affected situation due to the experiences during the pandemic		
I was not affected	17	4.2
I rarely met my family, relatives, colleagues and neighbors	96	23.9
I became distant to my entertainment and social life	123	30.6
Distance education	166	41.3
Things made you feel best during the pandemic		
Spending time with my family	142	35.3
Sparing time to myself	146	36.3
Praying ad worshipping	28	7.0
Spending time on mobile devices and social media	96	17.4
The subject which needed the most support during the pandemic		
Psychological support	185	46.0
Financial support	101	25.1
Medical support	30	7.5
No need for support	86	21.4
Positive changes occurring in personality during the pandemic		
No, I feel the same	167	41.5
No, I feel worse	188	46.8
Yes, I feel better	47	11.7

The data examining students' PTG scores analyzed according to various variables are given in Table 4. The female students' mean scores from PTGI, CSPS, CPLS and CROS were significantly higher than those of male students (P < 0.05). The PTGI, CSPS and CPLS mean scores of the students stating their family income was higher than their expenses were significantly higher than

others ($P < 0.05$). The PTGI, CSPA and CROS mean scores of those with no chronic physical disease were significantly higher than those who had a chronic physical disease ($P < 0.05$). The PTGI, CSPA, CPLS and CROS mean scores of the students who did not smoke were significantly higher than those who smoked ($P <$

0.05). Likewise, the PTGI, CSPA and CPLS mean scores of the students who did not use alcohol were significantly higher than those who used ($P < 0.05$). The data analyzing PTG scores of the students according to various variables are given in Table 5.

Table 4. Distribution of PTGI and its subscale according to students' descriptive characteristics

	PTGI	CSPA	CPLS	CROS
Gender*				
Female	48.08±23.01	25.26±12.47	14.97±7.09	7.84±5.57
Male	37.83±26.84	19.81±13.95	11.47±8.09	6.55±5.94
P	0.001	0.001	0.000	0.051
Economic Status of Family**				
Less income than expense	41.33±23.59	21.88±12.88	12.85±7.37	6.59±5.39
Equal income to expense	46.27±23.88	24.18±12.89	14.34±7.44	7.74±5.62
More income than expense	55.15±25.17	29.21±13.50	16.87±7.46	9.06±6.67
P	0.013	0.017	0.021	0.059
Chronic Physical Disease*				
Yes	32.21±23.69	16.68±12.22	10.89±8.25	4.63±5.00
No	46.30±23.99	24.32±12.98	14.30±7.41	7.68±5.67
P	0.020	0.015	0.093	0.018
Smoking Habits*				
Yes	37.29±23.87	19.90±13.00	11.30±7.44	6.08±5.76
No	47.16±23.90	24.70±12.92	14.65±7.38	7.80±5.63
P	0.004	0.009	0.002	0.033
Alcohol Use*				
Yes	34.65±20.94	18.23±12.03	11.08±6.63	5.34±3.86
No	46.30±24.18	24.31±14.02	14.32±4.49	7.67±5.74
P	0.016	0.027	0.033	0.057

*Independent sample t-test, **One-Way ANOVA test and Tukey test.

Table 5. Distribution of PTGI and its subscales according to attributes of the students regarding COVID-19 pandemic

	PTGI	CSPA	CPLS	CROS
Having COVID-19*				
I, myself got sick only	43.41±22.24	23.75±13.61	12.91±6.81	6.75±4.67
My family got sick	42.79±24.37	22.05±13.32	13.76±7.51	6.97±5.48
Both myself and all family members got sick	46.21±23.51	24.48±12.54	14.09±7.08	7.63±5.62
Neither me nor my family got sick	47.21±26.60	24.28±14.45	14.95±8.33	7.96±6.29
P	0.662	0.556	0.730	0.697
The most affected situation due to the experiences during the pandemic*				
I was not affected	16.52±19.95	9.41±12.47	5.52±5.64	1.58±2.82
I rarely met my family, relatives, colleagues and neighbors	49.88±26.19	26.05±14.12	15.63±8.03	8.19±6.00
I became distant to my entertainment and social life	48.69±21.27	25.27±11.64	15.21±6.33	8.19±5.63
Distance education	43.90±23.23	23.27±12.51	13.35±7.41	7.27±5.45
P	0.000	0.000	0.000	0.000
Things made you feel best during the pandemic*				
Spending time with my family	48.27±22.26	25.71±11.91	14.38±6.55	8.18±5.67
Sparing time to myself	55.98±22.96	29.16±12.20	18.24±7.51	8.58±5.77
Praying and worshipping	37.44±22.83	19.19±12.68	11.62±6.69	6.61±5.31
Spending time on mobile devices and social media	34.85±29.66	19.17±15.65	9.85±8.81	5.82±6.71
P	0.000	0.000	0.000	0.074
The subject which needed the most support during the pandemic*				
Psychological support	48.43±23.16	25.72±12.80	15.08±7.28	7.62±5.38
Financial support	42.20±23.77	22.13±12.64	12.77±7.72	7.29±5.49
Medical support	46.60±26.06	22.76±13.97	15.40±6.61	8.43±6.67
No need for support	43.32±23.55	22.73±13.39	13.26±7.76	7.32±6.16
P	0.147	0.094	0.039	0.781
Positive changes occurring in personality during the pandemic*				
No, I feel the same	45.59±24.97	24.04±13.08	13.80±7.49	7.75±6.11
No, I feel worse	42.00±22.62	21.82±12.59	13.19±7.07	6.98±5.12
Yes, I feel better	60.31±21.76	32.23±13.41	19.12±7.24	8.95±6.01
P	0.000	0.000	0.000	0.085

*One-Way ANOVA test and Tukey test.

There was no significant difference between the mean scale scores of the students according to COVID-19 diagnosis ($P > 0.05$). There was a significant difference between Cpls mean scores of the students regarding the subject which needed the most support during the pandemic. Similarly, there was a significant difference between the students' mean scale scores regarding the most affected situation due to the experiences during the pandemic. The advanced analysis indicated that the mean scale scores of the students who stated there was no difference at all stemmed from the mean scale scores ($P < 0.001$). There was a significant difference between the students' mean scores according to the things made them feel best during the pandemic. The difference stemmed from the mean scores of the students who preferred sparing time to themselves and their mean score was found to be significantly higher than other groups ($P < 0.001$). There was a significant difference between students' mean scores according to positive changes occurring in personality during the pandemic. This difference stemmed from the mean scale score of the group stating that their personality had a more positive effect during the pandemic process and the mean score of this group was significantly higher ($P < 0.001$).

4. Discussion

COVID-19 pandemic, as a traumatic experience, besides being a very hard process for nursing students as well as individuals from every segment of society, has also become an opportunity for development. This study conducted analysis of the variables affecting PTG levels of nursing students during COVID-19 pandemic.

The studies have found that women are more affected by the side effects of traumatic events and are more prone to develop psychopathology, but have higher PTG scores than men (Li et al., 2019; Hamama Raz, 2020; Jonsen and Afgun, 2020; Chen et al., 2021). Our study found that female students compared to male students had higher total scores from change in self-perception, change in philosophy of life and PTG ($P < 0.05$). Vishnevsky et al. (2010) conducted a meta-analysis study and found that this difference could have stemmed from the tendency of women to be more dealing with reflection compared to men. They defend that tendency of reflection in such constructive topics as increased awareness of personal strengths or appreciation of the importance of social connections can play an active role in PTG of women.

Our study found that PTG levels of those stating that their family had good economic status were higher. There are similar results from other studies (Wang et al., 2014; Sørensen et al., 2019; Yıldız, 2021). Since students' good economic status has allowed them to easily cope with problems especially financial ones during the pandemic, this is believed to provide good support in the adaptation process to trauma.

One of the important results of our study is that PTGI, CspS and CROS means scores of those not diagnosed with chronic physical disease were found to be higher ($P <$

0.05). There are limited studies in this regard. Wang et al. (2014) found that growth of individuals with physical chronic diseases after fighting with cancer, which is a traumatic factor, was lower than those who did not have an additional chronic disease. These results, besides the trauma experienced, may be attributed to negative effects of a different chronic disease on the meaning of life, perspective, optimism and psychological resilience of individuals.

University years are a new physical, social, emotional and intellectual period, which is the transition to young adulthood and cognitive, social and emotional changes (Sönmez, 2015). During this period, individuals may experience anxiety and stress due to uncertainties of leaving home and family, adapting to a new environment, being a candidate for a profession or finding a job (Onan, 2016). Smoking, alcohol and substance abuse can be coping preferences for individuals in this period (Gümüş, 2015). In our study, 15.4% of the students smoked and 5.7% used alcohol. PTG levels of the students who smoked and used alcohol were found to be low ($P < 0.05$). Many studies emphasize that smoking and using alcohol negatively affect the PTG (Arpawonga et al., 2015; Forbesa et al., 2015). These results may have stemmed from students' preferences on negative coping strategies against stressors.

COVID-19 pandemic process has negatively affected the lives of individuals for many reasons like the risk of infection, risk of losing beloved ones, fear of death, physical restrictions, social distance, online education, etc. (Brooks et al., 2020; Codagnone et al., 2020; Galea et al., 2020). PTG levels of the students who stated they were not negatively affected during the pandemic were lower. There are other studies supporting our results. Chen et al. (2021) stated that nurses who provided care to patients with COVID-19 in the intensive care units of pandemic hospitals had higher PTG than nurses working in other clinics. Erten and Kocakaya (2020), Peng et al. (2021) pointed that individuals having trauma showed development in a positive way in terms of personal strength, spiritual relationships and relationship with others after the difficulties they faced. The study results support the belief of Tedeschi and Calhoun (1996) that people reach wisdom and accuracy through hard experiences.

Experiencing trauma does not mean that an individual will have PTG. Except for traumatic events, individual and environmental factors are stated to be effective on growth (İnci and Boztepe, 2013). Our study found that the students who could spare time to themselves during the pandemic had higher PTG than other groups. In studies conducted with nursing students (Yılmaz et al., 2017; Shdaifat et al., 2018), the factors such as intense academic environment, difficulties in patient care and long-term hospitalization increase stress levels; and participating in activities such as sports, painting, etc. has a positive effect in coping with stress. The reason for the increase in the posttraumatic growth of students who

have the opportunity of sparing time to themselves may be that the students who have difficulty in sparing time to themselves have more time self-development in pandemic conditions.

One of the most remarkable findings was the statements of "I had positive changes in my personality during the pandemic". The students having this statement had very high mean scores from PTG levels, change in philosophy of life and change in self-perception. Cui et al., (2020) stated that there was an increase in posttraumatic growth of nurses who were frontline health workers during the COVID-19 pandemic, and nurses deemed this process as a great contribution to their professionalism. Again Chen et al. (2021) stated that PTG levels of the nurses working in intensive care units of pandemic hospitals and providing care to COVID-19 patients were higher than those in other clinics. This may be an explained particularly by the existentialist philosophy that "Trauma can be an experience in which people question the meaning of life, and agony changes and matures people. It causes positive changes in their self-perception." (Inci and Boztepe, 2013).

4.1. Limitations

The study has been done on nursing students in the health sciences faculty in a university that is in Turkey's Central Anatolia Region. Our study results are limited to the answers given by the students to the forms.

5. Conclusion

Trauma is widely known by the negative consequences they cause. The studies about people successfully coping with negativities are unfortunately very rare. The study which focused on the positive effects of traumatic experiences only found that women, students without a chronic disease, good economic status, and students who do not smoke or use alcohol showed higher PTG. Also, those who spared more time to themselves and thought that the process positively affected their personality had higher PTG.

In this regard, it is very important to conduct further studies with different groups to determine the transformative, healing, integrative and reconstructive effects of a unique trauma of the COVID-19 pandemic.

6. Practical Implications

The changes caused by the pandemic especially in education field have caused more traumas in people. New learning styles and education models should be developed for students at all ages and levels. Furthermore, specific topics such as "establishing positive interpersonal relationships, flexible thinking, critical and creative thinking, optimism, and self-efficacy, altruism, using humor, protecting personal and professional moral boundaries, emotional intelligence, and problem solving and coping" should be included in the curriculum of specific fields like nursing.

The pandemic may negatively affect individuals at all ages in different ways. Specific psycho-social interventions should be developed considering personal characteristics so that individuals can use the pandemic process as a stepping stone.

Author Contributions

The authors confirmed that all listed authors meet the authorship criteria and that all authors are in agreement with the content of the manuscript. All authors made critical revisions to the manuscript for important intellectual content and approved the final version to be published.

Conflict of Interest

The author declared that there is no conflict of interest.

Ethical Approval/Informed Consent

After the research was designed, the necessary permission as well as research ethics committee approval was obtained from the university where the study would be conducted (Date: 17.02.2021, Meeting No: 19/14, Decision No: E-95799348-050-7015). Besides, the procedure was applied following the Helsinki Declaration.

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