RESEARCH ARTICLE

Post-traumatic growth among frontline doctors fighting against COVID-19 at a tertiary care public hospital in Karachi, Pakistan

Kheenpal Das,[1] Saima Qureshi,[2] Anum Haider,[3] Muhammad Tarique,[4] Rinku Rani Bhatija[5]

Abstract

Objective: To evaluate post-traumatic growth experienced by medical doctors who served coronavirus disease-2019 patients.

Method: The cross-sectional study was conducted from December 1, 2021, to February 28, 2022, at the Civil Hospital, Karachi, and comprised medical doctors of either gender aged >22 years who directly provided care for at least one month to coronavirus disease-2019 patients. Other than demographic and professional profile of the subjects, data was collected using the Post-Traumatic Growth Inventory, with total score ≥60 indicating a positive post-traumatic growth. Data was analysed using SPSS 22.

Results: Of the 166 subjects approached, 150(90.3%) finished the study. There were 90(60%) females, 88(58.7%) were aged 25-35 years, 55(36.7%) were married, 107(71.3%) were postgraduate trainees, 79(52.7%) had 1-3 family members in the vulnerable groups, and 43(28.7%) had received any sort of psychological training. The mean post-traumatic growth score was 64.81±20.27 and 87(58%) doctors scored ≥60. The odds of experiencing post-traumatic growth for doctors with the number of vulnerable family members were significant ($p<0.05$). Doctors who had received psychological training before providing care to coronavirus disease-2019 patients showed higher odds of experiencing post-traumatic growth ($p<0.05$).

Conclusion: Coronavirus disease-2019 resulted in substantial positive psychological growth for frontline doctors. Psychological training showed a significant role in post-traumatic growth.

Key Words: Post-traumatic growth, Psychological COVID-19, Healthcare provider, Pakistan.

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Introduction

The word trauma has its genesis in the Greek language which defines it as something that can pierce the skin or break the body sheath or envelope[1]. In terms of physical trauma, there is evident damage to the skin tissues. In psychology, trauma metaphorically describes how incidences can pierce the mind and damage its mental, emotional and perceiving capabilities[2,3].

The concept of psychotrauma was first studied by Charcot. During his work on hypnosis, he learned that repression of memories of stressful and traumatic incidences was the core underlying psychopathology of different psychiatric disorders[4]. Pierre Janet further elaborated the phenomenon by explaining it through dissociation associated with adverse events. According to Janet, dissociated memories may later re-emerge as physiological conditions, emotional instability and even flashbacks of the event[3]. It was after World War I that the concept of psychotrauma matured. It encompassed the various physiological symptoms arising as a result of traumatic war experience. It was refined into what we know now as post-traumatic stress disorder (PTSD). Psychotrauma can be profoundly distressing and may bring with itself disturbing emotions, ill physical health, and social and functional impairment. While every individual reacts differently to traumas, the commonly elicited negative responses are dissociation, anger, anxiety, depression and physical distress[5]. Concomitantly with negative emotions, individuals also show heightened resilience and a true sense of value and respect for life and nature. If a person positively grows in even one area of life after struggling with significant crisis, the individual is said to have experience post-traumatic growth (PTG)[6].

The term PTG was first presented in 1996[7]. Over time, scientists, particularly those working in the salutogenic paradigm, experimented with PTG and have agreed to define it as an individual's positive psychological change experienced after struggling with challenging and stressful life events. The positive psychological change may involve interpersonal relationships, a greater sense of personal strength, and modification in religious or spiritual beliefs[8]. The hypothesis that potential benefits

[1-4]Department of Psychiatry, Dow University of Health Sciences, Karachi, Pakistan, [5]Department of Psychiatry, Civil Hospital, Karachi, Pakistan.

Correspondence: Kheenpal Das. Email: dkheenpal@yahoo.com

ORCID ID. 0009-0005-8110-4577

may be drawn from adversity and trauma has been proposed in various psychosocial theories, such as the constructivist self-development theory[9]. The organismic valuing theory of growth through adversity suggests that "*people are intrinsically motivated toward rebuilding their assumptive world in a direction consistent with their innate tendency toward actualisation*"[10].

Previously, coronavirus disease-2019 (COVID-19) has been established as a collective trauma for almost everyone globally which is strong enough to affect mental wellbeing[11]. Being a highly exposed group, medical doctors have been recognised to be adversely impacted by the pandemic in terms of their psychosocial wellbeing[12]. Since PTG is a newer phenomenon and has been under scientific scrutiny for only about two decades, literature on PTG at the professional level is scarce. It has been evaluated among military personnel[13], police officers[14], and emergency service providers[15]. Individuals reported a higher PTG if they were exposed to a direct and severe threat[14]. A recent online survey reported that Chinese frontline nurses during the pandemic experienced a medium to high level of PTG[16]. Keeping this in view, the current study was planned to evaluate the extent of PTG among medical doctors who served COVID-19 patients at the frontline.

Subjects and Methods

The cross-sectional study was conducted at the Civil Hospital, Karachi (CHK) from December 1, 2021, to February 28, 2022. The period coincided with the peak of the second COVID-19 wave in the country. The CHK is a public-sector hospital that was facilitating COVID-19 patients through designated care units for moderately ill patients. In times of peak waves, selective beds were assigned for COVID-19 patients in other wards as well. During the current study, 5 wards, having a total of 150 beds, were serving moderately ill COVID-19 patients, and one intensive care unit (ICU) with 10 beds was providing care to the critically ill patients. Most doctors were working in 12-hour shifts, and sometimes it ran into 24 hours as well. In peak wave of the pandemic, doctors from all tiers – interns, postgraduate trainees (PGTs) and faculty members – from almost all medical and allied specialties were mobilised by the administration for COVID-19 ward duties under the supervision of specialists of Infectious Diseases, General Medicine, and Pulmonology.

Purposive and convenient sampling technique was used to collect the samples. After approval by the institutional ethics review board, the sample size was calculated using OpenEpi[17] calculator on the basis of formula Z2p (1-p)/(e)2 where Z = confidence level at 95% (standard value of 1.96), p = estimated PT prevalence 43.7%[14], and e = margin of error 5%.

Frontline departments in the study were defined as the testing centre, the outpatient COVID-19 clinics, the emergency unit, the wards and the designated ICU. The sample comprised medical doctors of either gender aged >22 years in the identified frontline departments who directly provided care for at least one month to COVID-19 patients. Those who were not willing to participate were excluded.

A survey form was designed to collect demographic data, like gender, age, marital status, household income, and family members in vulnerable groups, like children, pregnant women, elderly and immunosuppressed. Also noted were professional data, including professional title, whether they had received any psychological training during the pandemic, and, if yes, did the training help them cope with the pandemic in a more effective manner.

The second part of the survey form comprised the Post-Traumatic Growth Inventory (PTGI) which is a valid and reliable instrument to assess PTG on 5 domains of change; relating to others, new possibilities, personal strength, spiritual change, and appreciation for life. It has 21 items that are scored on a 6-point Likert scale, with 0 = "no change" and 5 = "complete change". The total score ranges 0-105, with higher scores indicating greater PTG. A total score ≥60 indicates a positive PTG[7]. Cronbach's alpha value of PTGI was 0.955 in the study, suggesting good reliability.

Data was analysed using SPSS 22. Demographic and clinical characteristics were treated as independent categorical variables and were presented as frequencies and percentages. PTGI score was treated as both descriptive and categorical. Mean and standard deviation (SD) were calculated for total PTGI score and the scores of the 5 domains. With a cut-off score of 60, the PTGI score was converted into a dichotomous categorical variable and presented as frequency and percentage. For evaluating the relationship between descriptive variables, independent sample t-test was used, and for categorical variables, chi-square test was applied. Binary logistic regression model was applied to determine the influence of demographic and clinical factors on PTGI score. P≤0.05 was taken as significant.

Results

Of the 166 subjects approached, 150(90.3%) finished the study. There were 90(60%) females, 88(58.7%) were aged 25-35 years, 55(36.7%) were married, 107(71.3%) were PGTs, and 79(52.7%) had 1-3 family members in the vulnerable groups. Of the total, 43(28.7%) doctors had

Table-1: Characteristics of the subjects and association with post-traumatic growth (PTG).

Participant characteristics (N=150) (n; %)	(Mean ± SD)	P value	PTG Score <60(n;%)	≥60(n;%)	*P value*
Gender					
Male (n=60; 40%)	61.62 ± 23.34	0.015	29 (48.3%)	31 (51.7%)	0.199
Female (n=90; 60%)	66.94 ± 17.75		34 (37.8%)	56 (62.2%)	
Age in years					
25-35 (n=88; 58.7%)	64.17 ± 20.85	0.721	37 (42.0%)	51 (58.0%)	0.809
36-46 (n=45; 30%)	64.67 ± 18.92		20 (44.4%)	25 (55.6%)	
47-57 (n=17; 11.3%)	68.53 ± 21.43		6 (35.3%)	11 (64.7%)	
Marital Status					
Married (n=55; 36.7%)	65.78 ± 18.90	0.658	21 (38.2%)	34 (61.8%)	0.471
Single (n=95; 63.3%)	64.25 ± 21.09		42 (44.2%)	53 (55.8%)	
Professional Title					
Intern (n=30; (20%)	68.03 ± 21.86	0.441	8 (26.7%)	22 (73.3%)	0.139
Postgraduate trainee (n=107; 71.3%)	63.47 ± 19.32		50 (46.7%)	57 (53.3%)	
Faculty member (n=13; 8.7%)	68.46 ± 24.36		5 (38.5%)	8 (61.5%)	
Monthly household Income (PKR)					
50,000-100,000 (n=32; 21.3%)	62.97 ± 21.88	0.923	15 (46.9%)	17 (53.1%)	0.870
100,000-150,000 (n=49; (32.7%)	65.84 ± 18.22		19 (38.8%)	30 (61.2%)	
150,000-200,000 (n=48; 32%)	64.44 ± 22.29		21 (43.8%)	27 (56.3%)	
>200,000 (n=21; 14%)	66.10 ± 18.55		8 (38.1%)	13 (61.9%)	
Family members of vulnerable groups					
None (n=17; 11.3%)	47.94 ± 19.28	0.001	15 (88.2%)	2 (11.8%)	0.001
1-3 (n=79; 52.7%)	66.24 ± 17.20		28 (35.4%)	51 (64.6%)	
4-6 (n=54; 36%)	68.04 ± 22.41		20 (37.0%)	34 (63.0%)	
Psychological training					
Yes (n=43; 28.7%)	71.58 ± 16.86	0.009	12 (27.9%)	31 (72.1%)	0.027
No (n=107; 71.3%)	62.09 ± 20.95		51 (47.7%)	56 (52.3%)	
Psychological training helped in coping (n=43)					
Yes (n=27; 62.7%)	72.44 ± 13.86	0.023	6 (22.2%)	21 (77.8%)	0.168
No (n=14; 2.5%)	68.07 ± 22.15		6 (42.9%)	8 (57.1%)	

received some sort of psychological training, and, of these, 27(62.7%) reported that the training had helped them cope with the pandemic (Table 1).

Table-2: Total and domain scores for post-traumatic growth inventory (PTGI).

Post-traumatic Growth Inventory	Mean	Standard Deviation
Total Score	64.81	20.27
Score ≥60, n (%)	87 (58.0%)	
5 Domains		
Relating to Others, 7 items	20.93	7.66
New Possibilities, 5 items	14.58	4.61
Personal Strength, 4 items	13.00	4.51
Spiritual Change, 2 items	5.12	2.64
Appreciation of Life, 3 items	10.19	3.02

The mean PTG score was 64.81±20.27 and 87(58%) doctors scored ≥60 (Table 2). Association of PTG was significant with the number of vulnerable family members and with those who had received psychological training(p<0.001).

Univariate analysis showed that doctors with 1-3 family members in vulnerable groups had 13.66 times the odds of experiencing PTG (95% confidence interval [CI]: 2.91-64.08; p=0.001) and doctors with 4-6 family members in vulnerable groups had 12.75 times the odds of experiencing PTG (95% CI: 2.63-61.61; p=0.002). On multivariate analysis, the odds of experiencing PTG for doctors with 1-3 family members in vulnerable groups increased to 14.15 (95% CI: 2.46-81.29; p=0.003), and for doctors with 4-6 family members in vulnerable groups the odds increased to 15.03 (95% CI: 2.67-84.66; p=0.002). On univariate analysis, doctors who received psychological training before providing care to COVID-19 patients showed 2.35 times higher odds of experiencing PTG (95% CI: 1.09-5.06; p=0.029) which increased to 2.80 (95% CI: 1.09-7.14; p=0.031) on multivariate analysis (Table 3).

Discussion

PTG is a concept of positive psychology which emphasises on optimistic by-products of trauma. PTG has previously been studied in populations having undergone a major life trauma, like medical illness[18], war[19], and sexual abuse[20], among others. COVID-19 is considered a mass trauma. Healthcare workers (HCWs) who spent days and nights providing care to COVID-19 patients have suffered additionally due to limited availability of protective gear, repeated trauma of witnessing morbidity and mortality, and fear of contaminating their families, especially those who are

Table-3: Association of variables with post-traumatic growth (PTG).

Participant characteristics	Univariate analysis OR (95% CI)	Multivariate analysis OR (95% CI)
Age in years		
25-35	Ref.	
36-46	0.75 (0.25-2.21)	0.76 (0.33-1.77)
47-57	0.68 (0.21-2.16)	1.12 (0.34-3.71)
Gender		
Male	Ref.	Ref.
Female	0.64 (0.33-1.25)	1.75 (0.82-3.71)
Marital status		
Single	Ref.	Ref.
Married	0.77 (0.39-1.53)	0.97 (0.44-2.12)
Household income (PKR)		
50,000-100,000	Ref.	Ref.
100,000-150,000	0.69 (0.27-2.14)	3.04 (0.79-11.71)
150,000-200,000	0.97 (0.33-2.78)	1.84 (0.48-7.12)
>200,000	0.79 (0.27-2.25)	1.79 (0.40-8.00)
Family members of vulnerable group		
None	Ref.	Ref.
1-3	13.66* (2.91-64.08)	14.15* (2.46-81.29)
4-6	12.75* (2.63-61.61)	15.03* (2.67-84.66)
Professional Title		
Intern	Ref.	Ref.
Postgraduate trainee	0.41 (0.17-1.01)	0.30 (0.09-1.03)
Faculty member	0.58 (0.14-2.31)	0.91 (0.11-7.16)
Psychological training		
No	Ref.	Ref.
Yes	2.35* (1.09-5.06)	2.80* (1.09-7.14)

* p value <0.05; CI: Confidence interval, OR: Odds ratio, PKR: Pakistani rupee.

part of vulnerable groups. Living through prolonged times of continuous strain can lead to mental health issues, such as stress, anxiety, depression and PTSD[12].

Indeed, from trauma emerges growth. The mean score of PTGI was 64.81±20.27 and 87(58%) doctors scored ≥60, indicating positive PTG. In a Chinese study, 40% nurses reported PTG[21]. The probable reason for better PTG in the current study may be that most of the sample was young and already enrolled in a rigorous PGT programme which aims at building comprehensive patient management skills. Also, the current study was conducted at the time of the second COVID-19 wave when most people, in general, had come out of the unpredictability of the pandemic, and the frontline doctors were probably more ready to face the challenges than those during the first wave.

Two cross-sectional studies assessed PTG among frontline COVID-19 nurses in China during the first wave of pandemic. One study reported PTG score of 65.65±11.50[22] and the other one reported 70.53±17.26[16]. Both studies reported a higher mean score compared to the current finding A study comprising frontline HCWs from New York in the US during the second wave reported that 76% HSWs experienced PTG[23].

Literature has evaluated different factors that influence the extent of PTG. In the current study, female participants reported a higher mean PTGI score. Female gender is reportedly known to show higher PTG compared to males[24]. Women are more likely to indulge in productive and contemplative reappraisal, have a deeper awareness of self-traits and personal strengths, and employ adaptive coping skills[25].

The current finding that participants with more family members of vulnerable group experienced higher growth can be attributed to the dynamics of overall family systems in Pakistan. In a traditional family system, where grandparents, parents, children and siblings live together, the sample population, the doctor in the family, plays a crucial role in managing everyday ailments among the older persons who are repeatedly exposed to disease and sickness. Congruent to the studies conducted with caregivers of older persons and people with chronic illnesses, PTG in the current study may also be mediated by positive coping styles and resilience[26]. Personality traits, including extraversion, conscientiousness, and openness to experience are also said to be associated with PTG[27].

The current study has limitations. Being a cross-sectional study, it did not try to establish any causal relationship. Also, response bias may have been significant. Besides, the study did not take into account other important variables, such as coping strategies, post-traumatic stress, and social support. It was a single-centre study with a small sample. Finally, the study used a single instrument to evaluate PTG. Future studies should avoid such limitations.

Conclusion

COVID-19 resulted in substantial PTG for frontline doctors, especially among those with family members in the vulnerable groups. Besides, psychological training showed a significant role in PTG.

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