Impact of Covid-19 on mental health and the role of personality: Preliminary data from a sample of Italian university students

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Abstract

Introduction: The aim of the present study is to describe the stress levels of university students during a new phase of the Covid-19 pandemic (Spring 2022) that is a gradual approach to normality. More specifically, the influence of personality traits able to modulate the distress was investigated. *Materials and Methods*: 120 students from the University of Parma were consecutively recruited. A state tests (Symptom Questionnaire) and two trait tests (P Stress Questionnaire and Cattell's 16-Personality Factors) were administered. A comparison with similar data collected in 2019 was made. Moreover, the regression analyses calculated the amount of variance in psychopathological symptoms (anxiety, depression, somatization, and hostility) explained by the personality traits and the presence of behavior and lifestyles at risk for stress-related disorders. *Results*: The scores of the SQ showed psychopathological symptoms above the clinical cut-off for all global clinical scales (anxiety, depression, somatization, and hostility) with values significantly higher than those of the 2019 sample for anxiety, depression, and somatic complaints. The inferential analyses demonstrated that individual factors predicting anxiety are high levels of somatic tension and emotional instability and low levels of openness to change as well as the difficulty in disconnecting from commitments. The inability to relax also predicts somatizations, along with emotional instability, apprehension, and vigilance. Hostile mood is predicted by tension, emotional instability, and openness to change, along with poor warmth. Finally, depression has high tension, low social boldness, and the presence of somatic disorders as predictors. *Conclusion*: The Covid-19 pandemic has significantly increased levels of distress among university students. Moreover, specific personality factors were found to significantly predict the psychopathological symptoms. Certain individual traits, such as somatic tension, emotional instability, and reduced openness to change predict both anxiety activation and irritable mood. Other single traits seem to be more specific. Shy and introverted people are more prone to depression while distant and reserved persons tend to approach others with hostility. In conclusion, having the ability to identify individual factors predisposing to psychological distress could help the health professionals in implementing primary and secondary prevention programs.

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1. Introduction

According to a systematic review looking at the impact of the Covid-19 pandemic on people's mental well-being, levels of psychological distress have increased considerably around the world (Becerra-García et al., 2021; Bueno-Notivol et al., 2021; Cavalera, 2020; Lima et al., 2020; Rajkumar, 2020; Rossi et al., 2020) and many people have experienced a negative impact on their mental state (Bolatov et al., 2021; Vahedian-Azimi et al., 2020). The Covid-19 has created an unprecedented global health challenge (Choi et al., 2020; Moroianu et al., 2021) involving the whole population and all individuals from children to elderly (Choi, 2021). Numerous changes to how people live their daily lives were described. For instance, some factors such as isolation, social distancing, death of loved ones, distance from family, loss or reduction of work activities emerged (Kathirvel, 2020; Settineri & Merlo, 2020) and even an increase in domestic violence, child abuse, gambling, substance abuse (Frisone et al., 2020; Galea et al., 2020), and an augmentation of rare disorders such as the Hikikomori phenomenon (Kathirvel et al., 2020) were noted. One or more of these factors could have affected each person, which has an effect on their response to stress being more or less accentuated depending on gender, age (Commodari et al., 2021; Procaccia et al., 2022), and other individual characteristics (Benedetto et al., 2022; Kathirvel et al., 2020). Several studies have already highlighted the impact of Covid-19 on people's mental health, revealing an increase in symptoms of fear perception, anxiety (Gori et al., 2021), depression, somatization, feelings of loneliness and isolation as well as a decrease in life satisfaction (Kathirvel et al., 2020; Kim et al., 2020). Furthermore, it appears that the prevalence of mental disorders has undergone an overall significant increase (Pierce et al., 2020; Winkler et al., 2020), possibly exacerbating pre-existing risk factors with individuals that were already vulnerable (Benedetto et al., 2022; Kathirvel et al., 2020).

One of the social groups that has been significantly affected by these changes found in daily life is students. There is already a good amount of research from the last ten years that analyzes the mental health of university students, including the increasing rates of psychological distress (Auerbach et al., 2018; Zivin et al., 2009). From Covid-19 there have also been several studies that extensively explored the impact of the pandemic on the lives of college students, highlighting a wide spread of different psychological symptoms, such as stress and difficulty in concentration (Baltà-Salvador et al., 2021; Lardone et al., 2021; Somma et al., 2021; Son et al., 2020; Zurlo et al., 2020), anxiety and depression (Cao et al., 2020; Galvin et al., 2021; Husky et al., 2020; Rusch et al., 2021), sadness, nervousness, irritability with increased ruminations (Commodari et al., 2021), eating disorders, alcohol/substance abuse (Browning et al., 2021;

Charles et al., 2021; Gritsenko et al., 2020), sleep disorders (Debowska et al., 2020), and even suicidal behaviors (Gómez et al., 2020; Xu et al., 2021).

Regardless of the challenges posed by the pandemic, admission into University already is a critical period for students because there are more complex demands on the academic and social level. Specific skills are strongly solicited when going to University, such as adaptation and independence, especially for those students living away from home (Saleh et al., 2017; Sussman & Arnett, 2014). Hence, in addition to these already added demands, the pandemic increased changing aspects in the community such as fear linked to the risk of contagion (Pantaleón et al., 2020; Rodríguez-Hidalgo et al., 2021), social isolation (Leal Filho et al., 2021), and massive use of technological devices for educational purposes (Frisone et al., 2020). Furthermore, several authors have pointed out how the long hours on home screens in shared and inappropriate spaces, the unavailability of technological devices, and the difficulty in "disconnecting" from the virtual world (Aguilera-Hermida, 2020; Islam et al., 2020; Kiraly et al., 2020; Papouli et al., 2020) increased levels of anxiety and depression among students (Galvin et al., 2021).

However, there are discordant positions among researchers as well. For instance, Bolatov et al. (2021) have seen how the transition from traditional learning to online learning has alleviated the symptoms attributable to burnouts, depression, anxiety, and somatization despite the fact that isolation has accentuated the burnouts and confirmed the need for sharing in stressful moments and the closeness it creates. In fact, some studies have carried out longitudinal investigations and illustrated that the levels of distress have gradually increased during the two years of the pandemic. Meda et al. (2020) and Bolatov et al. (2021) compared data collected in 2019 to data collected at the end of the first lockdown in the spring of 2020 and found that there was a significant increase in symptoms of depression, anxiety (Bolatov et al., 2021; Meda et al., 2020), obsessions and compulsions, eating disorders (Meda et al., 2020), burnouts, and somatizations (Bolatov et al., 2021). More recently, Zurlo et al. (2022) confirmed a substantial difference in the scores of anxiety, phobias, obsessions, compulsions, and psychoticism investigated through the SCL-90-R in three post-Covid-19 measurements (from April 2020 to November 2020, and again at April 2021) compared to similar data collected in 2017.

There is also research looking at the presence of risk factors and protective factors against the pandemic (Son et al., 2020). For instance, Volken et al. (2021) noted that a protective factor against the stress generated by Covid-19 could be if a student is studying to be a health professional. There were significantly higher psychological symptoms in non-healthcare students compared to healthcare students. In addition to this, another study conducted in June

2020 showed that age has an effect on a student's management and manifestation of distress (Rainford et al., 2021). It was found that when comparing fourth-grade students to second and third grade students, the fourth graders illustrated fewer worries than their younger colleagues did.

Additionally, other studies focused on the role of psychological factors in the onset of symptoms of anxiety and depression (Baiano, Zappullo, The LabNPEE Group, & Conson, 2020). These researchers used the scores of tests administered during the pre-lockdown period (between 2019 and 2020) to explain the trend of psychological symptoms being detected in April 2020 with the same subjects. Dividing students into high worriers and low worriers using the Penn State Worry Questionnaire (PSWD) scores from the pre-lockdown period, the authors identified those subjects that suffered more during the period of lockdown. In other words, subjects predisposed to brooding and worry production, also defined as high worriers, reported significantly higher psychological symptoms than low worriers did during lockdown.

Another interesting study is that of Biondi and colleagues (2021), in which they focused on the predictive power of personality traits on the modulation of symptoms that formed due to the pandemic. After administering the Personality Inventory (DSM-5-Brief Form), it was found that internalizing traits such as detachment, negative affect, and psychoticism are risk factors for the development of symptoms attributable to anxiety, depression, and stress and can even be considered predictors of the manifestation of psychological distress.

Other researchers (Rollè et al., 2022), drawing on the attachment theory perspective, described a direct relationship between attachment anxiety and perceived stress during the Covid 19 pandemic during the lockdown phase and besides partly mediated by loneliness and Covid-19 risk perception. Similarly, attachment avoidance was directly related to perceived stress and moreover this relationship was partially mediated by loneliness but not by Covid-19 risk perception.

Another interesting study to analyze the connection between Covid-19 and student's mental health was conducted in the spring of 2020 (just after the end of the lockdown). Meda et al. (2020) found an increase in psychological symptoms (especially in depression) in the whole sample examined, however, another important aspect emerged. By examining the psychological history of the participants, it emerged that the levels of distress of subjects with a negative anamnesis for previous mental disorders returned to pre-lockdown levels with the end of isolation. In other words, subjects with a positive history of mental disorders continued to show psychological suffering even after the end of the first lockdown.

These kinds of studies highlight the predisposing factors to stress and confirm what has already been described in the literature regarding the predisposition to mental disorders and vulnerability to stress (Arias et al 2020). Established personality traits, such as emotional instability and neuroticism, have been related to psychological symptoms because they predispose the individual to a greater reactivity to stress (Arias et al., 2020; Ormel et al., 2012). More specifically, the underlying mechanisms to stress are having a greater hyper activation of the Hypothalamic-Pituitary-Adrenal (HPA) axis (Birmaher et al., 1996; Dahl et al., 2000; Herane-Vives et al., 2018) and a genetic predisposition (Caspi et al., 2003, 2010) exacerbated by stressful life events (Pruneti et al., 2001, 2010). In fact, it is supposed that a particular period can provide the necessary stressors to aggravate conditions at risk for the development of mental disorders. It is even possible that the environment provides threatening stimuli that cause hyper activation of the HPA axis, which is one of the psychobiological predictive indices of anxiety and depression (Masi et al., 2001).

Considering the pandemic period, each phase has made changes to people's daily lives and required adaptation to them. For instance, even though safety protocols are gradually loosening up and the world is moving towards normalcy, the restoration of old habits that have been pending for about two years, such as attending classes face-to-face, can also elicit emotional and psychophysiological arousal. Italy's Universities are an example since students' courses are again being delivered in the traditional in-person way since April 2022.

1.1 Aims

Because the world is now entering into a new phase of the pandemic which is seen as a gradual approach to normality, the aim of the present study is to describe the stress levels (in terms of psychopathological symptoms) of university students in the current phase of the pandemic (from April to July 2022) and to observe possible significant differences considering the same measure of a group of voluntary students involved in a study of 2019. In addition, the authors want to highlight the possible influence of specific stable personality traits on the manifestation of the mental distress that can be considered as predisposing factors towards psychopathological disorders.

2. Materials and Methods

2.1 Sample

In this exploratory and cross-sectional study, 120 students (98 females and 22 males), aged between 19 and 62 years old (only one student was 62), were consecutively recruited. Criteria

for inclusion in the study were age > 18 years old; completion of informed consent; and no history of psychiatric and/or neurological syndromes (e.g., previous head trauma, epilepsy, etc.) and/or physical diseases (i.e., sensory disturbances of sight and/or hearing) that may limit the administration of the tests.

2.2 Procedures

The subjects were recruited through e-mail contact, and they were offered a link to book an appointment in the lab via the Outlook calendar. For this reason, the sample is made up of students of various majors (medicine, psychology, educational sciences, communication, law, economics, nursing, biology, information, etc.). A PhD Student of Clinical Psychology and two Undergraduate Psychology Students collected data between April and July 2022. This time was characterized by total resumption of in-person classes; hence, the appointments for the study were also in-person. Before administering the tests, the researchers provided information about the purpose of the study. An idea of the purpose of the psychometric test administered was offered without specification of the single scale test. Once the subjects completed the administration, they were offered the option to book another appointment via Outlook calendar to receive a description of their results during a psychological interview that would be kept confidential.

Furthermore, a comparative analysis on psychological symptoms has been conducted using data collected in 2019 (pre-pandemic period) from a group (n=78) of voluntary students from the University of Parma. From the survey conducted in 2019, raised in the context of a wider research project, only the SQ scores (see below) were used for the actual purposes. For both the studies, participation in the research was voluntary.

2.3 Measures

The *Symptom Questionnaire* (SQ; Fava et al., 1983; Kellner, 1976) was used to investigate the presence of psychopathological symptoms. It contains four scales based on the factorial analysis of the psychological symptoms of Anxiety (A), Depression (D), Somatization (S), and Hostility (H). Each scale can be divided into 2 sub-scales, one concerned with symptoms and the other with well-being, for a total of 8 sub-scales. Therefore, each of the main scales includes items from both the symptoms and the well-being sub-scales. The clinical cut-off corresponds to 4 for all the scales of the test. The SQ demonstrated to have high sensitivity and specificity levels (80% and 76% in general practice, respectively; 86% and 74% in hospital medical wards; and 83% and 85% in emergency departments (Rucci et al., 1994). Such observations allowed this instrument to be particularly adequate, not only for the initial assessment of the patients'

complex clinical profiles but also for a possible re-test of the self-reported symptoms overtime (Benasi et al., 2020). This test has weekly, daily, and hourly versions. For the purpose of this research the weekly version was used.

The *P Stress Questionnaire* (PSQ; Pruneti, 2011) is a tool made up of 32 items, grouped into six scales: Sense of Responsibility (SR), Vigor (V), Stress Disorders (SD), Precision and Punctuality (PP), Spare Time (ST), and Hyperactivity (H). It detects whether there is a present risk for stress-related physical disorders attributable to some characteristics of the personality configuration known as "Type A behavior". More specifically, the factor SR includes items related to specific attitudes such as taking life and personal duties too seriously (maintaining a level of continuous engagement in working or doing other activities). The factor V includes items that refer to the feeling of having characteristics such as vitality, energy, and stress resistance. The factor SD consists of items linked to troubles and problems usually related to stress reactions, such as a lack of sexual interest and difficulty falling asleep. The factor PP is made up of items that are relevant to behaviors characterized by spitefulness, precision, and punctuality. The factor ST is linked to items regarding the care of one's self, and the capability and possibility of relaxing and taking breaks from work. The factor H refers to behaviors characterized by extreme activity and the presumption of having a good resistance to fatigue. The Cronbach's alpha fall between .39 and .70 for all the various factors that compose the instrument. Stanine scores have a distribution between 1 and 9, with a mean of 5 and a standard deviation of 1.96. The *Cattell's 16 Personality Factor Questionnaire* (16PF; Sirigatti & Stefanile, 2011) is composed of 185 items, with three possible responses that identifies 16 primary, bipolar, and relatively independent factors. The 16 dimensions identified are A=Warmth; B=Reasoning; C=Emotional stability; E=Dominance; F=Liveliness; G=Rule-Consciousness; H=Social Boldness; I=Sensitivity; L=Vigilance; M=Abstractness; N=Privateness; O=Apprehension; Q1=Openness to change; Q2=Self-Reliance; Q3=Perfectionism; Q4=Tension. Raw scores are converted into stanine or standard-nine scale, ranging from 1 to 9. Scores between 4 and 7 are considered average. In addition to these primary factors, which constitute the fundamental traits of personality, the test provides a validity scale. Imagine Management (IM) is a scale of social desirability where high scores reflect socially desirable responses, and low scores indicate willingness to admit undesirable attitudes. The Cronbach's alpha fall between .69 and .75 in all the various international standardizations that have investigated its internal consistency.

3. Results

Statistical analysis was performed using Microsoft Excel and IBM SPSS Statistics (Version 28.0.1.0). Descriptive statistics of the scores obtained from the total sample in the SQ, PSQ, and 16-PF of the 2022 sample were performed with the calculation of the mean (M) and standard deviation (SD). Tests for skewness, kurtosis, and Kolmogorov-Smirnov were used to determine normality of distribution. Furthermore, in a multicollinearity test, no extreme coefficient values ≥0.8 were found among the independent variables, indicating a low risk of multicollinearity. All independent variables had variance inflation factors ≤10 and tolerance ≥0.1, indicating the absence of multicollinearity. Since all the assumptions for the conduction of parametric statistics have been respected, the following analyses were computed. The Independent Samples T-Test was used to assess the differences between the averages of the SQ

scores of the two groups (2019 vs. 2022). As to individual traits, a Pearson's correlation between trait personality measures (PSQ and 16-PF) have been performed. Lastly, hierarchical multiple regression analyses were performed to examine the amount of variance in psychological symptoms (Anxiety, Depression, Somatization, and Hostility scales of the SQ) explained by the independent variables (personality traits - 16-PF - , and lifestyle at risk for stress-related physical disorders - PSQ).

Considering the socio-demographic variables, the mean age of participants was 23.6 years (±6.6). Majority of the subjects were full time students (94.2%) with a small section being part-time students that hold a job as well (5.8%). Academic year distribution among students was 1 year (30%), 2 year (10.08%), 3 year (15.8%), 4 year (15%), 5 year (20%), and 6 year of study (0.8%).

The descriptive analyses conducted on the entire 2022 sample highlighted clinical aspects noteworthy. Looking at the mean of the SQ scores, the global scales for Anxiety, Depression, Somatization, and Hostility exceed the clinical cut-off (= 4). The sub-scales of the SQ show that there is a greater involvement of the behavioral components than the cognitive ones (Table 1).

These data were compared with those of a group of students recruited from pre-Covid era. Considering the two samples, they matched for Gender (Women of the sample of 2019: n=65, 83.3%; Women of the sample of 2022: n=98, 81.7%) and Age (Mean age of the sample of 2019 = 31.05 ± 13.04; Mean age of the sample of 2022 = 23.6 ± 6.6). The Independent Samples T-Test constituted a significant increase for the global clinical scales of Anxiety, Depression, and Somatization (Table 1).

Table 1. Comparison between the sub scales scores of the Symptom Questionnaire (Anxiety, Depression, Somatization, and Hostility) obtained by a group of students before the pandemic (sample of 2019) and a group of students during the actual phase of the pandemic (sample of 2022). Independent Samples T Test. *Significant at $p < 0.05$.

	Range	Sample of 2019 (pre-Covid)		Sample of 2022 (post-Covid)		t	p
		M	SD	M	SD		
Anxiety							
Anxiety	0-17	5.05	3.61	7.05	3.53	3.86	<.001
Relaxation	0-6	1.87	1.59	2.67	1.88	3.08	<.001
Total Score	0-23	6.92	4.71	9.72	4.63	4.12	<.001
Depression							
Depression	0-17	4.04	3.8	6.44	4.02	4.20	<.001
Contentment	0-6	1.42	1.65	1.41	1.71	-0.06	n.s.
Total score	0-23	5.45	4.88	7.85	5.09	3.30	<.001
Somatization							
Somatic Symptoms	0-17	4.67	4.06	6.62	4.51	3.09	<.001
Physical Well-Being	0-6	1.83	1.57	3.06	1.84	4.83	<.001
Total score	0-23	6.5	5.13	9.68	5.82	3.93	<.001
Hostility							
Hostility	0-17	4	4.07	4.59	3.71	1.05	n.s.
Friendliness	0-6	1.24	1.43	1.2	1.50	-0.20	n.s.
Total score	0-23	5.24	5.12	5.79	4.61	0.78	n.s.

The descriptive analyses conducted on the PSQ, which investigates the presence of behaviors and lifestyles at risk for stress-related physical disorders, highlighted medium-high scores on the Stress Disorders (7/9 stanine points) and Spare Time (7/9 stanine points) scales. These results underline the presence of somatizations specifically connected to psychological stress and the difficulty in dedicating time to extra-curricular and relaxing activities useful for "disconnecting" from commitments (Table 2).

Table 2. Descriptive Statistics (mean, standard deviation, and stanine scores - ranging from 1 to 9, scores between 4 and 7 are considered average) and relationship between variables.

Variable	M	SD	Stanine	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 16-PF Validity Scale (IM)	5.44	2.23	2	-																						
2 16-PF Warmth (A)	5.90	2.72	4	-	-																					
3 16-PF Reasoning (B)	5.14	1.44	6	-	-	-																				
4 16-PF Emotional Stability (C)	6.56	2.45	3	.27**	.17*	-	-																			
5 16-PF Dominance (E)	5.50	1.94	5	-	-	-	-.18*	-																		
6 16-PF Liveliness (F)	6.97	2.66	5	-	.31*	.17*	-	.29**	-																	
7 16-PF Rule-consciousness (G)	7.13	2.07	4	-	-	-	-	-	-	-																
8 16-PF Social Boldness (H)	5.79	2.24	4	-	.22*	-	-	-	.45**	-	-															
9 16-PF Sensitivity (I)	6.50	2.08	7	-	.28**	-	-	-23**	-	-	-	-														
10 16-PF Vigilance (L)	7.51	2.27	7	-	-	-	-.33**	.17*	-	-	-.17*	-	-													
11 16-PF Abstractness (M)	7.79	1.83	6	-	-	-	-	-	-	-	-	.17*	-	-												
12 16-PF Privateness (N)	6.22	2.05	3	-	-	-	-	.17*	-	-	-	-.18*	-	-	-											
13 16-PF Apprehension (O)	6.20	2.07	6	-	-	-	-.19*	-	-	-	-.20*	-	-	-	-	-										
14 16-PF Openness to Change (Q1)	6.22	2.05	4	-	-	-	-	-	-	-	-.21*	-	-	-	.26**	-	-									

Table 2. Descriptive Statistics (mean, standard deviation, and stanine scores - ranging from 1 to 9, scores between 4 and 7 are considered average) and relationship between variables.

Variable	M	SD	Stanine	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
15 16-PF Self-Reliance (Q2)	6.30	1.9	2	-	-.20*	-	-	-	-	-.20*	-	-.21*	-.17*	-	.20*	-	.21*	-								
16 16-PF Perfectionism (Q3)	6.95	2.28	3	.29**	-	-	-	-	.27**	-	.19*	-	-	-	.17*	-.17*	-	.22*	-							
17 16-PF Tension (Q4)	6.03	2.47	8	-	-.19*	-	-39**	-	-.31**	-	-.25**	-	.24**	-	-	.31**	-	-	-.31*	-						
18 PSQ Sense of Responsibility (SR)	6.48	3.39	6	-	-	-	-	-	-	.33**	-	-	-	.23*	-	-	-	-	.33**	-	-					
19 PSQ Vigor (V)	2.42	2.48	6	-	-	-	-	.37**	-	-	.36**	-	-	-	-	-	.23*	-	.37**	-	.22*	-				
20 PSQ Stress Disorders (SD)	3.77	1.85	7	-	-.21*	-.20*	-.31**	-	-	-	-	-	-	-	-	-	-	-	-.20*	.23*	-	-	-			
21 PSQ Precision and Punctuality (PP)	4.09	1.97	6	-	-	-	-	-	-	.20*	-	-.22*	-	-	-	-	-	-	-	-	.37**	-	-	-		
22 PSQ Spare Time (ST)	2.64	1.99	7	-	-	-	-	-	-	-	-	-	.21*	-	-	-	-	-	-	-	-	-	.17*	-	-	
23 PSQ Hyperactivity (H)	5.41	1.46	6	-	-	-	-	-	.24*	.21*	.20*	-	-	-	.21*	-	-	-	.40**	-	.33**	.36**	-	-	-	-
24 PSQ Total score	27.84	7.39	6	-	-	-.19*	-.30**	.22*	-	.27**	-	-	-	-	.20*	-	-	-	.31**	.21*	.79**	.49**	.38**	.42**	.33**	.49**

Legend: 16-PF = 16-Personality Factors Questionnaire; PSQ = P Stress Questionnaire; *=p<.05; **=p<.01.

Other interesting considerations connected to individual differences concern the personality dimensions investigated through the 16-PF. Considering that the average scores fall between 3 and 7 stanine points, medium-low scores emerged for factors A (Warmth), G (Rule-Consciousness), and H (Social Boldness). Lower scores at factors C (Emotional Stability), N (Privateness), Q2 (Self-Reliance), and IM (Imagine Management, that is the Validity Scale) can be observed. Medium-high scores were recorded for factors I (Sensitivity) and L (Vigilance), while the factor Q4 (Somatic tension) was recorded as a high score. Essentially, the sample of students recruited is emotionally unstable and reactive (factor C) and very tense (factor Q4). Furthermore, they are prone to rigid compliance with social norms (factor G) but, at the same time, base their considerations on empathy and feelings (factor I). In addition to this, some interesting characteristics emerge from the interpersonal-social point of view. For instance, these people have a low level of Self-Reliance which can make them dependent and lead to affiliate in social contexts (factor Q2). Additionally, these people tend to be cautious (factor N) and socially inhibited (factor H) and their behavior is characterized by high levels of alertness and suspiciousness (factor L) as well as confidentiality and detachment (factor A) (Table 2) (Figure 1).
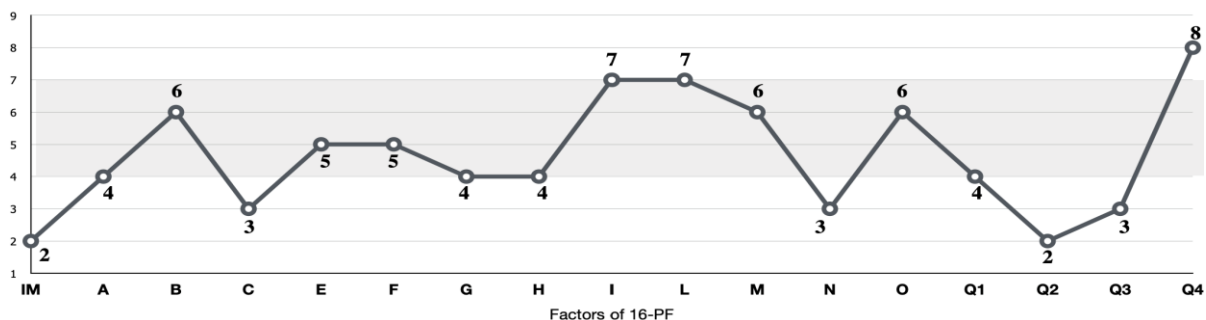

Figure 1. Representation of the mean scores of the 16-PF of the sample in a standard-nine scale, ranging from 1 to 9. The 16 dimensions identified, in addition to the validity scale (IM), are: A=Warmth; B=Reasoning; C=Emotional Stability; E=Dominance; F=Liveliness; G=Rule-Consciousness; H=Social Boldness; I=Sensitivity; L=Vigilance; M=Abstractness; N=Privateness; O=Apprehension; Q1=Openness to change; Q2=Self-Reliance; Q3=Perfectionism; Q4=Tension. Scores between 4 and 7 are considered average.

With this in mind, it also emerged that there are some clinically significant associations between stable personality traits (16-PF) and the lifestyles and behaviors usually adopted (PSQ) (Table 2). The Pearson's correlation made between 16-PF and PSQ highlighted aspects worthy of note.

The Sense of Responsibility (SR) assessed through the PSQ appears to be correlated with the factors G (Rule-Consciousness), M (Abstractness), and Q3 (Perfectionism). Observing the Vigor sub-scale of the PSQ, it emerges that there is a similar trend to the scales of Dominance (factor E), Liveliness (factor F), Social Boldness (factor H), Openness to Change (factor Q1), and Perfectionism (factor Q3). As regards the Somatic Disorders investigated through the PSQ, an inverse relationship emerges with the degree of Warmth (factor A), Reasoning skills (factor B), Emotional Stability (factor C), and Perfectionism (factor Q3). Instead, a positive relationship between somatizations and somatic tension (factor Q4) can be observed. The Precision and Punctuality (PP) sub-scale is associated with only two personality factors. PP correlates positively with the trend towards strict compliance with the rules (factor G) and negatively with factor I, indicating a preference towards the adoption of a concrete problem solving. Observing the Spare Time (ST) sub-scale, a single correlation emerges with the Vigilance scale, highlighting that higher levels of alertness correspond to difficulties in "detaching" from commitments, and vice versa. The PSQ Hyperactivity (H) scale is associated with different dimensions of personality. In particular, subjects with a high level of activity are lively (positive correlation with factor F) and sensitive (factor I), respectful of social norms and rules (positive correlation with factor G), yet are also prudent in social contexts (positive correlation with factor N) and prone to being thorough, diligent, and stubborn (factor Q3). Finally, the total score of the PSQ correlates positively with the scales of Dominance (factor E), Rule-Consciousness (factor G), Privateness (factor N), Perfectionism (factorQ3), and Tension (factor Q4) and negatively with the Reasoning (factor B) and Emotional Stability (factor C) scales.

Another aim of the present study was to verify whether stable individual traits (personality and behavior-lifestyles) have an effect on post-Covid psychopathological symptoms. For this purpose, a hierarchical linear multiple regression analysis was conducted considering as dependent variables, one at a time, the scores of the global clinical scales of the SQ (Anxiety, Depression, Somatization, and Hostility) and as independent variables the scores of 16-PF and PSQ.

Considering the anxiety, a hierarchical multiple regression analysis was performed to examine the amount of variance explained by the independent variables (Table 3). The final model in this study had F=8.043, p<.001 and was deemed suitable for the data. In the five-step search model of hierarchical regression analysis, the order of entry of independent variables in this study was as follows: factor Q4 of 16-PF, ST of PSQ, and factors C, Q1, and IM of 16-PF. In particular, the somatic tension (factor Q4), which reflects the level of tension and restlessness with respect to the last period of life, was entered first. The ST factor of the PSQ was entered

in Model 2, as well as the factor C in Model 3, the factor Q1 in Model 4, and the factor IM in Model 5. The hierarchical multiple regression analysis was performed in five steps. The regression equations of models 1 to 5 were statistically significant (F=22.601, p<.001; F=18.177, p<.001; F=16.581, p<.001; F=14.496, p<.001, F=12.949, p<.001, respectively). The variables added to Model 5 were Tension, Emotional Stability, Openness to Change, Image Management (respectively Q4, C, and Q1 factors of 16-PF), and Spare Time (ST of PSQ). Tension, emotional stability, and openness to change, together with the ability to take free time, explain a significant amount of variance in Anxiety (38.2%). The 3% more of variance is explained by the Image Management. The Q4 personality factor (β=0.28, p<.001) and the ST sub-scale of the PSQ (β=0.28, p<.001) have the greatest effect on Anxiety, followed by the factor C (β=-0.26, p<.001), the factor Q1 (β=-0.21, p=.002), and the factor IM (β=-0.18, p=.003).

Table 3. Hierarchical linear multiple regression analyses: predictors of Anxiety (Total score).

Model	Predictors	b	SE	β	t test	p
1	16-PF Factor Q4			$R^2 = .189^{***}$		
2	16-PF Factor Q4; PSQ Factor ST			$R^2 = .275^{***}$		
3	16-PF Factor Q4; PSQ Factor ST; 16-PF Factor C			$R^2 = .344^{***}$		
4	16-PF Factor Q4; PSQ Factor ST; 16-PF Factor C; 16-PF Factor Q1			$R^2 = .382^{***}$		
5	16-PF Factor Q4	0.54	0.16	0.28	3.27	.001
	PSQ Factor ST	0.69	0.20	0.28	3.47	<.001
	16-PF Factor C	-0.52	0.18	-0.26	-2.94	.004
	16-PF Factor Q1	-0.47	0.19	-0.21	-2.54	0.02
	16-PF Factor IM	-0.37	0.17	-0.18	-2.14	0.04
				$R^2 = .410^{***}$		

Note: All predictor variables are mean-centered. *Legend*: ***=*p*<.001; *b*=unstandardized regression coefficient; SE=standard error; *β*=standardized regression coefficient; 16-PF Factor Q4 (16-Personality Factors-Tension); PSQ Factor ST (P Stress Questionnaire-Spare Time); 16-PF Factor C (16-Personality Factors-Emotional Stability); 16-PF Factor Q1 (16-Personality Factors-Openness to Change); 16-PF Factor IM (16-Personality Factors-Image Management).

Also considering the depression, a hierarchical multiple regression analysis was performed to examine the amount of variance explained by the independent variables (Table 4). The final model in this study had F=17.284, p<.001 and was deemed suitable for the data. In the four-step search model of hierarchical regression analysis, the order of entry of independent variables in this study was as follows: factor Q4 of 16-PF, SD scale of PSQ, and factor H of 16-PF. In particular, the somatic tension (factor Q4) was entered first. The SD factor of the PSQ was entered in Model 2 and the factor H in Model 3. The hierarchical multiple regression analysis was performed in three steps. The regression equations of models 1 to 3 were statistically significant (F=29.788, p<.001; F=20.798, p<.001; F=17.284, respectively). The variables added to Model 3 were Q4, SD, and H. These personality traits along with the presence of stress-related physical disorders explain a significant amount of variance of Depression (35.3%). The Q4 personality factor (β=0.36, p<.001) has the greatest effect on Depression, followed by the SD scale (β=0.27, p=.002) and the H factor (β=-0.23, p=.008).

Table 4. Hierarchical linear multiple regression analyses: predictors of Depression (Total score).

Model	Predictors	*b*	SE	*β*	t test	p
1	16-PF Factor Q4			R² = .235***		
2	16-PF Factor Q4; PSQ Factor SD			R² = .302***		
3	16-PF Factor Q4	0.765	0.185	0.364	4.146	<.001
	PSQ Factor SD	0.769	0.242	0.268	3.177	0.002
	16-PF Factor H	-0.557	0.204	-0.234	-2.731	0.008
				R² = .373***		

Note: All predictor variables are mean-centered. *Legend*: ***=*p*<.001; *b*=unstandardized regression coefficient; SE=standard error; *β*=standardized regression coefficient; 16-PF Factor Q4 (16-Personality Factors-Tension); PSQ Factor SD (P Stress Questionnaire-Stress Disorders); 16-PF Factor H (16-Personality Factors-Social Boldness).

Considering the Somatization scale of the SQ, another hierarchical multiple regression analysis was performed to examine the amount of variance explained by the independent variables (Table 5). The final model in this study had F=12.898, p<.001 and was deemed suitable for the data. In the four-step search model of hierarchical regression analysis, the order of entry of independent variables in this study was as follows: C, O, and L factors of 16-PF and ST of PSQ. Emotional Stability (factor C) was entered first in Model 1. In Model 2 the factor O of 16-PF

was entered, the factor L in Model 3, and the ST scale of the PSQ in Model 4. The hierarchical multiple regression analysis was performed in four steps. The regression equations of models 1 to 4 were statistically significant (F=21.891, p<.001; F=16.198, p<.001; F=15.003, p<.001; F=12.898, p<.001, respectively). The variables added to Model 4 were Emotional Stability, Apprehension, and Vigilance (factors C, O, and L of 16-PF, respectively), and Spare Time (ST of PSQ). The personality traits (emotional stability, apprehension, and alertness) combined with the ability to relax, explain a significant amount of variance in Somatization (35.4%). The C (β=-0.27, p=.003) and O personality factors (β=0.27, p=.002) have the greatest effect on somatization, followed by the L personality factor (β=0.24, p=.007), and the ST scale of the PSQ (β=0.19, p=.003).

Table 5. Hierarchical linear multiple regression analyses: predictors of Somatization (Total score).

Model	Predictors	b	SE	β	t test	p
1	16-PF Factor C	**R² = .184***				
2	16-PF Factor C; 16-PF Factor O	**R² = .252***				
3	16-PF Factor C; 16-PF Factor O; 16-PF Factor L	**R² = .300***				
4	16-PF Factor C	-0.660	0.218	-0.271	-3.031	0.003
	16-PF Factor O	0.842	0.261	0.276	3.220	0.002
	16-PF Factor L	0.619	0.225	0.243	2.758	0.007
	PSQ Factor ST	0.570	0.260	0.185	2.188	0.031
		R² = .354*				

Note: All predictor variables are mean-centered. *Legend*: ***=*p*<.001; *b*=unstandardized regression coefficient; SE=standard error; *β*=standardized regression coefficient; 16-PF Factor C (16-Personality Factors-Emotional Stability); 16-PF Factor O (16-Personality Factors-Apprehensiveness); 16-PF Factor L (16-Personality Factors-Vigilance); PSQ Factor ST (P Stress Questionnaire-Spare Time).

Lastly, as to the hostility, the last hierarchical multiple regression analysis was performed to examine the amount of variance explained by the independent variables (Table 6). The final model in this study had F=8.043, p<.001 and was deemed suitable for the data. In the four-step search model of hierarchical regression analysis, the order of entry of independent variables in this study was as follows: Q4, A, C, and Q1 factors of the 16-PF. Somatic Tension (factor Q4) was entered first and then Warmth (factor A), the factor C, and the factor Q1 followed

respectively. The hierarchical multiple regression analysis was performed in four phases. The regression equations of models 1 to 4 were statistically significant (F=14.456, p<.001; F=10.601, p<.001; F=8.630, p<.001; F=8.043, p<.001, respectively). The variables added to Model 4 were Somatic Tension, Warmth, Emotional Stability, and Openness to Change (factors Q4, A, C, and Q1 of the 16-PF, respectively). With Somatic Tension, Warmth, and Emotional Stability a significant amount of variance of Hostility (21.4%) is understood. The 4.1% more variance of Hostility is explained by the factor Q1 (Openness to Change) of 16-PF in model 4. The personality factor A (β=-0.24, p=.009) has the greatest effect on the Hostility, followed by the factors C (β=-0.22, p<.02), Q4 (β=0.22, p=.03), and Q1 (β=-0.21, p=.003).

Table 6. Hierarchical linear multiple regression analyses: predictors of Hostility (Total score).

Model	Predictors	b	SE	β	t test	p
1	16-PF Factor Q4	**R² = .130***				
2	16-PF Factor Q4; 16-PF Factor A	**R² = .181***				
3	16-PF Factor Q4; 16-PF Factor A; 16-PF Factor C	**R² = .214***				
4	16-PF Factor Q4	0.399	0.179	0.218	2.231	0.028
	16-PF Factor A	-0.411	0.154	-0.244	-2.680	0.009
	16-PF Factor C	-0.422	0.182	-0.224	-2.320	0.023
	16-PF Factor Q1	-0.454	0.200	-0.206	-2.270	0.026
		R² = .255*				

Note: All predictor variables are mean-centered. *Legend*: ***=*p*<.001; *b*=unstandardized regression coefficient; SE=standard error; *β*=standardized regression coefficient; 16-PF Factor Q4 (16-Personality Factors-Tension); 16-PF Factor A (16-Personality Factors-Expansiveness); 16-PF Factor C (16-Personality Factors-Emotional Stability); 16-PF Factor Q1 (16-Personality Factors-Openness to Change).

4. Discussion

This study aimed to investigate the psychological well-being of a sample of Italian students at the University of Parma in a particular phase that was entering into the post-Covid period. In fact, the recruitment of the subjects and the administration of the tests began in April, in the same month in which the containment measures for Covid-19 were relaxed in Italy. Since April 1st, 2022, the university's courses were delivered fully in person, the obligation to attend was

restored, and in-person exams were back in place. The analysis of the literature carried out by the authors highlighted worrying results with respect to the mental health of students during the lock-down (Cavalera, 2020; Lima et al., 2020; Rajkumar, 2020; Rossi et al., 2020) as well as during the second and third wave of Covid-19 (Becerra-García et al., 2021; Bueno-Notivol et al., 2021). However, this study is first in discussing this new transition and phase during the pandemic and the struggle in returning to normality.

The results of our research confirmed the claims of previous authors about the effect of the pandemic on mental health (Pierce et al., 2020; Winkler et al., 2020). In fact, clinically significant scores emerged for all the global scales of the SQ. The sample exceeds the cut-off for anxiety, depression, and somatization as well as hostility. The subjects who took part in the study complain of anxious activation with somatic and physical distress, and mood alterations, both in a depressive and irritable sense. Contrary to what was expected, and what has been supposed by some authors (Aguilera-Hermida, 2020; Galvin et al., 2021; Kiraly et al., 2020; Islam et al., 2020; Papouli et al., 2020), the return to "normal life" has not generated an improvement in psychological well-being but has probably generated new environmental demands that students are trying to adapt to.

A necessary consideration regards the type of sampling. It is possible that our sample, although large and composed of students from various majors, is not completely representative of the students from the University of Parma because the students were all voluntarily participating in a clinical psychology study, in which their own psychological and/or emotional distress was a motivational factor. For these reasons we decided to compare, as past authors have done (Bolatov et al., 2021; Meda et al., 2020; Zurlo et al., 2022), the results of the SQ (for anxiety, depression, somatization, and hostility) of these subjects with those of a study dating back to 2019. However, the comparison made between psychopathological symptoms reported by the sample collected in 2022 with those of students who participated in a study in 2019 might be considered as a limitation of the study because of its non-longitudinal design, hence, our results can only be considered preliminary and not equal to longitudinal studies that may need to be implemented. The decision to compare the two groups of students was based on previous results obtained by other authors using the same statistical method and that is to compare two different groups of subjects but still pertaining to the same population. Indeed, the research conducted 3 years ago (pre-Covid-19) was also composed of volunteers who had been asked to participate in an observational study on anxiety and stress (which had very similar purposes to the post-Covid research). For this reason, the authors considered it possible to make a

comparison between groups to highlight the significance of the increase in pre-post pandemic symptoms. In fact, through this comparison it is possible to argue that there has been a significant increase in anxiety, depression, and somatizations. These data confirm previous studies that demonstrated how the pandemic actually decreased the psychological well-being of students (Cao et al., 2020; Galvin et al., 2021; Husky et al., 2020; Rusch et al., 2021). However, the worrying aspect is that this difference remains even in the submissive phase of the pandemic, which, as already mentioned above, should have favored the restoration of the level of psycho-physical health.

A further aim of this study was to investigate the role of some personality factors on the manifestations of distress. The literature includes numerous studies on psychological symptoms in a pandemic period and the role of external and internal factors that modulate their manifestations (Rainford et al., 2021; Volken et al., 2021). However, at present, few studies have evaluated the predictive role of stable personality traits (Baiano, Zappullo, The LabNPEE Group & Conson, 2020; Biondi et al., 2021).

By carrying out a descriptive analysis of individual factors, interesting aspects emerged in our sample. Considering the PSQ, it is possible to observe some behaviors of a lifestyle predisposed to the onset of stress-related physical disorders. First of all, problems, difficulties, and somatic complaints were referable to stress disorders (on Stress Disorders scale). In addition, a medium-high score emerged on the Spare Time scale which indicates the difficulty in "disconnecting" from commitments and the ability to relax following work/school activities. The absence of psychophysical recovery, necessary after psychophysiological activation, is one of the characteristics most found in patients suffering from stress disorders. However, it is also true that in recent years the measures to combat and contain the spread of the Covid-19 virus have significantly affected the free time and leisure activities for Italians citizens, as the government has severely limited their development.

Clinically significant characteristics also emerge from the analysis of the personality traits. The highest score is that of the Tension scale (Q4 factor), which indicated that the subjects who obtain high scores tend to be agitated and restless when they are made to wait (Sirigatti & Stefanile, 2001). A certain degree of tension can be channeled and motivate the action but an extremely high tension can lead to impatience and irritability. The source of the tension reflects both the characteristic tension of the person and the tension characteristic of his current life situation. In other words, it is possible that the pandemic has increased levels of tension and motivation for action, but it is also hindered and not adequately directed. Considering that the

factor Q4 may reflect the last period of life, it is possible to argue that Covid-19 is affecting not only the psychological state but also the subjects' stable traits. For instance, another factor of anxiety that emerges is Emotional Stability (factor C). This factor describes the level of emotional well-being and provides a measure of the ability to cope and adapt to everyday life and its challenges. In agreement with the authors, individuals with low scores may feel some lack of control over their lives. Generally, the factor C correlates with the validity scale (Image Management) as it is considered socially desirable to know how to adapt to life. In fact, our sample shows low score on the validity scale, indicating the willingness to admit emotional difficulties. This attitude could also be interpreted as a request for help from the examiner. Another trait of anxiety that emerges is Vigilance, which had a medium-high score and indicates that the subjects tend to maintain a high level of alertness and psycho-physiological activation. In addition to the traits of anxiety and neuroticism, other factors seem to be attributable to the domain of interpersonal and social relationships. In particular, the N and Q2 factors of 16 PF, are not within the normal range and means that these people are inhibited and cautious in social contexts while, at the same time, tend to affiliate. This aspect of ambivalence is generally frequent in introverted people where a certain dependence on some significant figures is associated with fear of new social contexts (Biondi et al., 2021). Furthermore, it could be said that in this sample neuroticism and introversion traits are the prevailing personality characteristics. Generally, these two personality traits are associated with a greater vulnerability to stress and a higher incidence of mental disorders (Arias et al., 2020; Ormel et al., 2012). As already mentioned above, it is possible to hypothesize that the volunteers who decided to participate in the study are the most sensitive and have suffered more than others during the pandemic period. However, it cannot be excluded that among the effects of the pandemic, and of all the government measures adopted, there are difficulties in managing emotions and an alteration of emotional-relational development that manifests with social withdrawal and privateness in interpersonal relationships.

In addition to these descriptive considerations, the main aim that has guided the present research concerns is the role of personality characteristics in the modulation of psychological symptoms. To our knowledge, only one study investigated the role of personality in predicting the emerging of psychopathological symptoms (Biondi et al., 2021). However, our research used a broader and more descriptive tool in order to identify all the personality dimensions regardless of the categorical approach. Indeed, the study by Biondi et al. (2021) had identified as risk factors for psychopathology certain internalizing traits (detachment, negative affect, psychoticism) that the DSM-5 (APA, 2013) considers pathological. Our regression analyses confirm that there is

an importance of personality traits on mental health. Considering anxiety, personality traits that can accentuate the symptoms are nervous tension, emotional instability, and a lack of openness to change. Furthermore, the validity scale is also a predictor of anxiety, and this means that an increase in anxious activation corresponds to a decrease in defenses aimed at offering a better self-image. With this all in mind, it is also true that the inability to devote time to leisure activities favors the maintenance of high levels of psychophysiological activation. This result highlights how important moments of leisure are to recover the psychophysical energies invested in work/school commitments. Furthermore, somatizations are also caused by personality traits such as emotional instability, apprehension, and alertness. Indeed, high levels of alertness and a high degree of worry and apprehension favor the maintenance of high levels of psychophysiological activation (Pruneti et al., 2021, 2022; Pruneti & Guidotti, 2022). Moreover, tension and emotional instability are involved in the modulation of the levels of hostility and irritability. In other words, high nervous tension, together with emotional instability and difficulty in adapting to new situations and changes, generates an alteration in the mood that is irritable. However, among these factors there is warmth. This result confirms what is already present in the literature about the effects of the manifestation or repression of emotions (Kline et al., 2008). In fact, reserved, detached, and nonsocial people tend not to express their emotions, especially the negative ones, such as anger. This tendency to control their anger does not correspond to an adequate management of emotions and generates further suffering (Apgáua & Jaeger, 2019). On the other hand, an alteration in mood oriented towards the depressive sense seems to have different predictors from those of hostility. In addition to the tension, which already predicts anxiety and hostility, the configuration of the introverted personality emerges. In particular, a decrease in social boldness corresponds to an increase in depressive manifestations. Thus, it is possible to argue that shy, cautious, and fearful in social settings people experience more intense depressive symptoms. Similarly, to what emerged with the manifestations of hostility, the importance of social involvement and support as a protective factor against mood changes also emerges in the case of depression. In the case of mood drop, it seems that people suffer more of it if they experience discomfort, lack of self-esteem, and embarrassment in social contexts. These data assume further importance given the current phase of the pandemic. In fact, the resumption of face-to-face activities has once again put shy and insecure people in difficulty.

Overall, the best predictor of psychological symptoms (anxiety, depression, and hostility) was found to be nervous tension. It seems that the psycho-physiological hyper activation does not correspond to an adequate channeling of energies. It is possible to hypothesize that the

pandemic has disrupted people's plans and that it will take some time before regaining management over the environment and one's life. However, it is important to underline that the authors of 16-PF (Sirigatti & Stefanile, 2001) highlight a positive aspect of the Q4 factor (Nervous tension). They underline that this trait can reflect the motivational drive of subjects to act, therefore it can be addressed in functional way. In accordance with some authors, it is possible to notice how emotions and feelings take on different meanings along a continuum that goes from acting to symptomatic masks (Boeker & Northoff, 2018; Bourlot, 2020; Merlo, 2019; Riley, 2019; Settineri & Merlo, 2020; Settineri et al., 2019a, 2019b). It is the clinical psychologist's responsibility to set goals and help people direct their suffering/motivation. In this study, the participants were given the opportunity to receive a clinical response and to discuss with the psychologist the eventual need to undertake a psychological intervention. Specifically, this was possible for a part of the sample, as 30% of them booked a second appointment to discuss the results of the tests. In addition, about a third of this minority was sent to a mental health specialist. Therefore, we tried to accommodate the request for help, wherever possible.

At the same time, other personality traits modulate the manifestation of psychological symptoms. For example, among the predictors of anxiety, hostility, and somatization there is the factor of emotional stability, which corresponds to emotional self-regulation skills. Furthermore, both anxiety and hostility are predictors to openness to change. Therefore, between the causes of the two emotions characterized by high levels of arousal there is the tendency to mental rigidity and the rejection of new situations. Finally, specifically with regard to the mood alterations, social involvement and participation seem to play an important role. As for hostility, it seems that the symptoms are accentuated in people who do not express and do not share them. On the other hand, in the manifestation of depressive symptoms it seems that personality traits such as social withdrawal, embarrassment, and low self-esteem affect more.

However, one of the main limitations of the present research concerns the ad hoc sampling which therefore is not representative of the general population of students at the University of Parma therefore only risk factors (and not protective factors) were described. Despite this important methodological limitation, some clinical considerations emerge nonetheless. In fact, considering the sample of overall suffering people, it was possible to identify the risk factors that favored their approach to mental health professionals. In addition, different categories of individuals vulnerable to stress were described among these people because different personality

characteristics emerged that lean more toward conditions characterized by anxious hyper activation or, on the contrary, to hypo activation typical of depressive syndromes (Cosentino et al., 2018; De Vincenzo et al., 2022).

Although these are preliminary data, highlighting the personality traits involved in the manifestation of distress, they allow identification of the stable factors that characterize individuals, regardless of their period of life. For this reason, it is important to carry out a trait analysis when people are experiencing periods of high stress (as in the case of the pandemic) in order to identify the category of people most suffering and who possess those characteristics that further accentuate their psychological distress which, in turn, may hinder adherence to medical indications considering that psychologically distressed people could perceive less fear of getting infected and be exposed to harmful and dangerous behaviors (Veronese et al., 2021).

In conclusion, a small historical review is necessary. Considering that the term "stress" was firstly described by Selye in 1936 as a general condition with nonspecific symptoms that favors the adaptation of the organism to the request of the environment, it is possible to consider the Covid-19 pandemic as a stressor in all respects. Indeed, the stress response is called General Adaptation Syndrome (GAS) precisely to emphasize that it supports the coping mechanism (Selye, 1956, 1998). More specifically, the GAS occurs in three phases. In the first phase (alarm), there is the activation of the Sympathetic Nervous System (SANS) in which the body mobilizes energy resources and directs them towards a fight or flight behavior. In the second phase (adaptation), the body tries to adapt to the new situation. Here there is an overproduction of stress hormones (i.e., cortisol), and the body organizes itself to adapt and cope with the stimulus. Finally, in the third phase (exhaustion), there are two possible outcomes: the extinction of the stress response or a condition of functional exhaustion that occurs when the exposure to the stimulus continues for a long period and the organism does not have the resources to resist and/or adapt further (Frisone et al., 2021; Kemeny, 2003; Rice, 1999; Selye, 1956). Furthermore, for many stress theorists the definition of a stimulus configuration as unwanted would not be sufficient to induce a stress reaction. Instead, the situation would need to be one that demanded a coping response. This demand is often said to depend on the situation's being defined as a threat to one's psychological or physical well-being (Cohen, 1985; Frisone et al., 2021; Lazarus, 1966; Sells, 1970). Briefly, Sells (1970) argues that stress arises when: (a) one is called on to respond to a situation for which one has no adequate response and (b) the consequences of failure to respond effectively are important to one. Some specific effects of a continual inability to control important events are suggested by Seligman (1975) who argues that continual exposure to events one can do nothing about frequently results in a psychological state of

helplessness. This state of helplessness includes a lessening in one's perception of control over outcomes and a decrease in one's motivation to initiate new responses. Extreme effects of helplessness include fear, anxiety, depression, and physical diseases (Frisone et al., 2021).

To summarize, it is possible to sustain that the Covid-19 pandemic has blocked some individuals in the second phase of the GAS. In agreement with the DSM-5 (APA, 2013), psychological symptoms that appear in response to stressful events fall within the definition of the Adjustment Disorder that occurs when a person who has recently been exposed to one or more sources of stress fails to adapt and develops abnormal emotional and behavioral responses. Indeed, the two core symptoms are the failure to adapt and preoccupations but the clinical manifestation can greatly change according to individual differences. For instance, the DSM-5 (APA, 2013) identifies different facets of this condition including depressed mood, anxiety, and conduct disorders (O'Donnell et al., 2019). From a clinical point of view, these are precisely the psychopathological symptoms that clinical psychologists usually investigate and whose analysis is only the starting point toward a path of psychological change. For some people, the Covid-19 pandemic represented a crisis and a source of activation (Settineri & Merlo, 2020) that may have generated an openness to suffering and probably the search of meaning. These factors usually represent a crucial node of the human state as well as the "engine of change".

5. Conclusion

Consistent with previous studies, our work has confirmed that the levels of psychological suffering have increased following the pandemic and that, despite the gradual de-implementation of the measures to contain the infection, a return to pre-Covid levels is not yet observable. Furthermore, it is possible to argue that even the return to "normal life" may have created changes and new demands to which it is necessary to adapt. Moreover, for some people, this may have generated a greater alteration of the psychological balance than others may. Precisely with respect to this point, our research wanted to offer its own contribution. Given that only two studies have focused on the predictive power of personality traits, in the present study the focus is precisely on this aspect. Personality traits related to neuroticism and introversion seem to be the most involved. This aligns with the existing literature on vulnerability to stress. However, it cannot be ruled out that the pandemic and the restrictive measures have precisely solicited those risk factors related to the onset of mental disorders. In fact, it is possible to argue that the last two years have altered people's lives and have strongly hindered the sociality and development of emotional-relational skills of young adults. However, it is also possible that the sample in our study is mostly made up of those people vulnerable to

stress who seek psychological help. In any case, knowing that there are personality factors predicting the manifestation of psychological distress facilitates clinicians in their practice. The results suggest that a preliminary assessment with two short tests (PSQ and 16-PF) might effectively identify people at greater risk of developing mental health problems and targeting mental health professionals. Therefore, it would be useful to implement counseling services in schools and universities in order to intercept those vulnerable people. In addition, intervening on risk factors might slow down the onset of mental disorders. Nonetheless, it is necessary to intervene if there are really periods of high stress, such as this of the pandemic, to intercept even the hidden demand and encourage adherence to psychological interventions.

Informed Consent Statement: All data were handled in accordance with the ethical standards established in the 1964 Helsinki Declaration. Subjects 'anonymity was preserved, and the data obtained were used solely for scientific purposes.

Data Availability Statement: The data presented in this study are available upon reasonable request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

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