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DEPRESSION, ANXIETY, STRESS, AND COPING MECHANISM DURING COVID-19 PANDEMIC

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ABSTRACT. The current pandemic due to the COVID-19 virus has caught the entire world by surprise, on all aspects of life, from economic and work-related ones to education and online communication. Psychological health issues are not an exception to this rule, as people have been forced to either stay indoors during lockdown periods, or completely change their habits for longer periods of time. In this study, we investigated the effects of the pandemic on a sample of 241 adults, on several concepts. The study is relevant for understanding the factors that can contribute to maintaining a balance in life, especially in times of hardship.

Keywords: anxiety, coping, Covid-19, depression, stress.

Introduction

The impact of COVID-19 pandemic on mental health is greater for people with anxiety-related disorders. Wang et al. (2020) found that during the initial response to the pandemic outbreak in China, from 1210 respondents more than half (53.8%) rated the psychological impact of the outbreak as moderate or severe. In a study on 500 respondents from Hong Kong, Choi et al. (2020) found that 19% of them had experienced depression and 14% symptoms related to anxiety. In Ireland, more than 27,7% from 1041 respondents were screened positive for depression and generalized anxiety during the first week of

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lockdown measures (Hyland et al., 2020). It is important to note that these percentages are higher than similar reports from studies conducted before the COVID-19 pandemic. In another large study from China from multiple provinces, the results showed that the level of psychological distress was higher, 29.9% of the respondents experienced mild to moderate symptoms associated with depression (Qiu et al., 2020). These results are emphasized by a recent meta-analysis on studies conducted during the COVID-19 that screened for depression. Results showed that the prevalence of depression was 7 times higher, from 3.44% in 2017 to 25% in 2020 (Bueno-Notivol, 2021).

One explanation for higher depression, stress and anxiety during the COVID-19 lies in the information overload characterized by contradictory information issued by various international or local authorities (Choi et al., 2020). At the same time, a higher exposure to social media is another variable that can explain an increased level of anxiety (Choi et al., 2020; Gao et al., 2020). Asmundson et al. (2020) found that people with anxiety-related disorders were more predisposed to isolation reporting increased fear of contamination, xenophobia, or high-stress levels.

During the Covid-19 Pandemic, people have used all sorts of coping strategies, from problem focused strategies to emotion focused ones, socially supported strategies (Zacher & Rudolph, 2021), or avoidance coping ones (Carver et al., 1989). A study by Taylor et al. (2020) on people with a high level of stress regarding the strategies used for coping with COVID-19 showed that they preferred to be active in trying to cope with isolation. They tried to cope in an adaptive manner by setting a routine or connecting with other people online but also experienced maladaptive strategies such as over-eating or consuming drugs and alcohol (Taylor et al., 2020).

Related to the behavior of those who were in stressful conditions, Barziley et al. (2020) found that respondents reported more worries about others and not about themselves, fear that one of their family members will get Covid-19, and a fear about the possibility of spreading the virus. These prosocial behaviors when external circumstances are stressful are considered a form of resilience in the face of the pandemic outbreak, and a form of altruism for overcoming adversity (Barzilay et al., 2020; Southwick et al., 2005).

In a sample of adults from the Spanish general population results showed that following a balanced diet, not reading the news, engaging in a pleasant activity, and staying outdoors were predictors of a low level of anxiety and depression (Fullana et al., 2020). Among the factors that generated a high level of anxiety was the loss of job, symptoms associated with COVID-19, negative life events and following a treatment related to mental health problems in the last three months, as well as caring for a person (Fullana et al., 2020).

In a longitudinal study from Serbia during the emergency state due to pandemics that assessed the changes in four emotional states (worry, fear, boredom, and anger) for five weeks, results showed a decrease in all four emotional states over time, starting with worry, followed by fear and boredom (Sadiković et al., 2020). Being in an unfamiliar situation increases the degree of fear and worry, but at the same time new strategies of coping are emerging which modify behavioral reactions in relation to the negative circumstances (Sadiković et al., 2020).

Among the most predisposing factors to anxiety, stress and depression were the female gender, student status, and having physical symptoms (Wang et al., 2020). In a study conducted by Fitzpatrick, Harris, and Drawve (2020) on US sample adults, results showed that socially vulnerable respondents (women, unmarried, not working, or Hispanic) were the most prone to depression due to the lack of resources to help them to get through this period. Fear of COVID-19 was the most prevalent feeling having a direct influence on symptoms associated with depression (Fitzpatrick et al. 2020). Also, in Italy, during the initial phase of the COVID-19 pandemic, results from a study showed high levels of distress, females being more prone to increased anxiety, stress, and depression (Mazza et al., 2020). Losada-Baltar et al. (2020) obtained similar results on 1310 Spanish people where female participants reported higher distress associated with the COVID-19 outbreak. In another research, the authors have found that women are more predisposed to a high level of anxiety and depression, meaning that the impact of the COVID-19 pandemic is more powerful on women than on men (Özdin & Özdin, 2020).

The impact of rational and irrational beliefs on depression, anxiety and stress

In the ABC model of Rational Emotional Behavioral Therapy (REBT), people live positive or negative experiences developing rational and irrational beliefs about them (Balkis & Duru, 2019). Also, these beliefs have an impact on emotional, cognitive, and behavioral reactions (Balkis & Duru, 2019). Rational beliefs have an adaptive character, they are healthier and have a protective role in terms of response to stress, depression, or anxiety (David et al., 2005; Hyland et al., 2014; Balkis & Duru, 2019).

At the opposite pole are irrational beliefs that refer to the absolutist demands, catastrophizing thoughts, the need to be liked by others, or the lack of tolerance regarding tension or emotions (Balkis & Duru, 2019). Previous research showed that irrational beliefs are associated with depression, anxiety,

and symptoms related to post-traumatic stress disorder (Oltean et al., 2017; Vîslă et al., 2016; Balkis & Duru, 2019; Chan & Sun, 2020). Moreover, in a meta-analysis regarding the relationship between irrational beliefs and distress, results showed that overall irrational beliefs were positive associated with anxiety, depression, and stress (Vîslă et. al., 2016).

Rational beliefs can act as protective factors against negative experiences, current findings showing a positive association with happiness and optimism due to a greater acceptance of oneself and flexibility (Oltean et al., 2019). Related to COVID-19 pandemic the research is somehow limited regarding the effects of irrational beliefs on depression, anxiety and stress. A study done by Hashemi et al. (2020) found a significant indirect effect of irrational beliefs on fear of COVID-19, this finding being attributed to the fact that there may be some individual psychological variables, such as the level of sensitivity to anxiety that may lead to fear or other emotional reactions. Moreover, the effect of irrational beliefs through catastrophic thinking could be found in cases of suicide due to COVID-19 pandemic and also in the increased concern regarding mental health during the pandemic (Goyal et al., 2020; Gunnel et al., 2020; Mamun & Griffits, 2020).

Methodology and sampling

Participants

A total of 241 people responded to the questionnaire's items, with demographic factors as seen in Table 1 and as following: 16.5% males and 83.5 females, with age ranging from 18 to 78, a mean age of 30.34 (SD=10.63), with 87% coming from urban areas and 13% from rural ones. As for the marital status, 35% declared to be married, 60% not married and 5% have not declared any option.

Table 1. Demographics of the sample

Demographic		**N / (%)**
Age		18-78 (M = 30.34, SD = 10.63)
Gender identity		
	Males	40 / 16.5%
	Females	241 / 83.5%
Provenience		
	Urban	210 (87%)
	Rural	31 (13%)

Demographic		**N / (%)**
Marital Status		
	Married	85 (35%)
	Not married	145 (60%)
	Not replying	11 (5%)
Isolated with		
	Alone	30 (12.5%)
	Family	165 (68.5%)
	Partner / Friends	46 (19%)
Living during the Pandemic		
	Apartment	142 (58.7%)
	House	93 (38.4%)
	Other	7 (2.9%)
Now living in… area		
	Urban	42 (17.4%)
	Rural	199 (82.6%)
Education		
	Highschool	100 (41.3%)
	Faculty	81 (33.5%)
	Masters' / MBA	50 (20.6%)
	PhD	10 (4.5%)

Instruments

For this research, we used a set of four validated instruments: General Attitude Beliefs Scale (Lindner, Kirkby, Wertheim, & Birch, 1999), Brief Cope (Carver, 1997; Carver, Scheier, & Weintraub, 1989), Social Emotional Competences Development Inventory (Seal, Beauchamp, Miguel, Scott, Naumann, Dong, & Galal, 2012), and DASS21 (Lovibond & Lovibond, 1995). The purpose was to assess how people deal with the stress and anxiety triggered by the current worldwide pandemic, and the influence that their thinking style and social-emotional competences might have. We will briefly discuss each scale, in the interest of understanding their core measures and psychometrics.

General Attitude Beliefs Scale. This scale has good psychometric properties (Bernard, 1988), with a total of 26 items structured around 7 factors (Rationality, Self-Downing, Need for Achievement, Need for Approval, Need for Comfort, Demands for Fairness, Other Downing). The scale can be administered both individually and collectively, on a 5-points Likert scale, ranging from 1=strongly disagree to 5=strongly agree.

Brief COPE. The Brief-COPE scale is a self-report, 28 item measure, that assesses how effective or ineffective someone is at coping with stressful situations. The scale can be used to measure both how the general population copes with adversity such as bad personal news, and how patients deal with negative diagnosis news (Carver, 1997). Initial and subsequent analysis (Carver et al., 1989; Eisenberg, Shen, Schwarz, & Mallon, 2012), indicated two main factors for this scale: Avoidant Coping and Approach Coping, where the first factor shows a style that is less effective for managing anxiety, while the ladder is mainly associated with a better response to adversity and a more stable emotional response. Avoidant Coping includes the following subscales: Self-distraction, Denial, Substance use, Behavioral disengagement, Venting, and Self-blame, while the Approach Coping includes: Active coping, Emotional support, Use of informational support, Positive reframing, Planning, and Acceptance. There are two subscales, Humor and Religion, that do not load on either Avoidance or Approach coping.

Social Emotional Competences Development Inventory (SECDI). This instrument has 32 items, self-report inventory developed by Seal et al. (2012) that measures how people perceive themselves and how others might perceive them, measuring 8 competences (emotions, aptitude, empathy, monitoring, sociability, intimacy, initiative, and inspiration) on four factors (Self Awareness, Consideration of Others, Connection to Others and Influence Orientation). Self-Awareness is seen as the ability to understand your own emotions, to assess your strengths and weaknesses and to recognize your preferences, and it includes three categories: emotional self-awareness, a correct self-evaluation, and a tendency identification. A second factor is Consideration of Others, which includes empathy and monitoring your thoughts and actions. A third factor is Connection to Others and involves sociability and intimacy, namely the ease of building relations and communicating with trust and honesty. The fourth factor is Influence Orientation, which includes initiative and inspiration, or the ability to motivate and inspire others (Seal, Naumann, Scott, & Royce-Davis, 2011).

DASS21. The name of this scale is an acronym that stands for Depression Anxiety and Stress Scale and encompasses 21 items, along three axes (depression, anxiety, and stress). The scale has an excellent internal consistency of .94, very good convergent validity and diagnostic utility (Gloster, Rhoades, Novy, Klotsche, Senior, Kunik, Wilson, & Stanley, 2008).

Procedure

The study was approved by the Babeş-Bolyai University Ethical Committee (No. 2214/5.03.2021) and was conducted in compliance with the declaration of Helsinki. This research involved an anonymous survey administered online. There were no email addresses, names or personal identifiers requested. Data was collected in the months of April and May 2020, targeting adults from Romania, Europe. In the introductory part of the survey, we provided an informed consent, and the completion of the survey was considered as a consent for participation in the study. Participants in the study were found through convenience and snowball sampling, using methods such as personal contact, social media, and diverse professional networks.

Results

Distress in the Covid-19 Pandemic context

At the moment of the evaluation, a number of 158 respondents (65.6%) indicated an above average level of rationality on the GABS scale, while 29 respondents (9.9%) showed a very low or low level of rationality, and 54 respondents (22.4%) showed an average rationality. As for the level of irrationality, there were 112 respondents (46.5%) that had a very low or low level of irrationality, 75 (31.1%) of the respondents with an average level and 54 (22.4%) with a high or very high level or irrationality. The rest of the values for the scales that comprise the level of irrationality, can be seen in Table 2.

Table 2. Values for GABS scale

	Rationality	**Own global evaluation**	**Achievement**	**Approval**	**Comfort**	**Demand for justice**	**Others global evaluation**	**Irrationality**
Very low or low	29 12%	79 32.8%	64 33.2%	73 30,3%	113 46,8%	98 40,7%	74 30,8%	112 46,5%
Average	54 22.4%	98 40,7%	75 31%	83 34,4%	88 36,6%	57 23.7%	103 42,7	75 31,1%
High or very high	158 65.6%	64 26,5%	102 35,8%	85 35,3%	40 16,6%	86 35,6%	64 26,5%	54 22,4%

Coping strategies in the Covid-19 Pandemic

As for the data recorded on the Brief Cope scale, we have decided to divide the results in half - a lower half, consisting of answers of 1 and 2, and an upper half, consisting of answers of 3 and 4, as seen in Table 3. Since the scale does not have a clear cutoff point, we have decided upon this approach, to help gain clarity in comparison. A number of 72 respondents (30%) have engaged in an avoidance type of coping behaviors, whilst the majority of the respondents (70%) have scored in the lower half of the results on the Avoidance Coping subscale of the Brief Cope scale. Similarly, 62.7% of the respondents had results in the upper half of the scale. This shows that most of our respondents used strategies that are beneficial to them and engaged less in harming or avoiding behaviors. Regarding self-distraction, 69% of the respondents have used this strategy, while 65% have seeked emotional support. Also, the use of informational support can be seen in our study too, as 60% of the respondents have used this coping strategy.

In our sample, religion was not a strategy used by most of the respondents, instead humor was, with 71.4% of respondents using humor as a coping strategy. Although in this scale, humor is not included in either avoidance or approach scales, it is still a widely used self-protection strategy (Fritz, Russek & Dillon, 2017). Moreover, positive reframing was used by 82.2% of the respondents, planning by 75% of the respondents and acceptance coping by 85%.

Table 3. Respondent's values to Brief Cope scale

Subscale	Lower half	Upper half
Self-distraction (Avoidant)	66 (31%)	175 (69%)
Active coping (Approach)	37 (15.3%)	204 (84.7%)
Denial (Avoidant)	197 (82%)	44 (18%)
Substance use (Avoidant)	207 (86%)	34 (14%)
Emotional support (Approach)	84 (35%)	157 (65%)
Use of informational support (Approach)	97 (40%)	144 (60%)
Behavioural disengagement (Avoidant)	208 (86.3%)	33 (13.7%)
Venting (Avoidant)	103 (42.7%)	138 (57.3%)
Positive reframing (Approach)	43 (17.8%)	198 (82.2%)
Planning (Approach)	53 (22%)	188 (78%)
Acceptance (Approach)	36 (15%)	205 (85%)
Self-blame (Avoidant)	129 (53.5%)	112 (56.5%)
AVOIDANCE	169 (70%)	72 (30%)
APPROACH	90 (37.3%)	151 (62.7%)
Religion*	133 (55.2%)	108 (44.8%)
Humor*	69 (28.6%)	172 (71.4%)

*Humor and Religion are neither Approach or Avoidance coping

Coping strategies in the Covid-19 Pandemic

It is safe to say that no one was truly prepared for what the Covid-19 Pandemic brought, not just in terms of health and economic problems, but also in terms of socializing and dealing with emotional issues that otherwise might have not been noticed. The fact that roughly the entire world population had to work from home, avoid meeting with other people, and changing habits, meant that some might adapt better than others. And if social emotional competences are useful in normal times, then in times like the pandemic, they have become a must, and this can be best done in educational settings, that can teach children and adolescents such skills (Hadar, Ergas, Alpert & Ariav, 2020).

In the model proposed by Seal et al. (2011), the results achieved in the Social Emotional Competences Development Inventory (SECDI) are to be ranked from the highest to the lowest, where the value ranking first is considered a level of mastery, the one ranked second is a competence, third is a threshold and the last one is to be developed. As can be seen in table 4, the respondents have mastery in social awareness, namely in emotions control and the aptitude of identifying those emotions and knowing why they feel how they feel. Then, they have competences in empathy and monitoring, which belong to the factor - consideration of others.

Table 4. Mean values for the main factors and competences of SECDI

		Ranking order							
Factor	**Competence**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Self-Awareness	Emotions	29.31							
Self-Awareness	Aptitude		27.92						
Consideration of Others	Empathy			27.69					
Consideration of Others	Monitoring				27.23				
Consideration of Others	Intimacy					26.81			
Influence Orientation	Inspiration						23.78		
Connection to Others	Sociability							22.99	
Influence Orientation	Initiative								21.75
		Mastery		Competence		Threshold		Development	

They have the threshold for intimacy and inspiration. And the need for development is for sociability and initiative, which makes total sense, since one of the main characteristics of the pandemic was the inability to socialize and take new initiative, due to restrictions and unpredictability. Of course, there is

cautiousness needed when looking at these results, since the differences are not that large between the results for each category, except perhaps between the first and last two.

Depression, anxiety, and stress in the Covid-19 Pandemic context

These three psychological constructs (depression, anxiety, and stress) have been measured with DASS21 and the results can be seen in Table 5. In relation with depression, 50.2% (n = 121) of the sample had normal levels of depression and 21.6% (n = 52) moderate levels. Only 9.1% (n = 22) and 7.9% (n = 19) of the sample had experienced severe or extremely severe depressive symptoms. Regarding anxiety, 51% (n = 111) had normal levels, 10.4% (n = 25) had severe anxiety, and 5.8% (n = 14) of the respondents experienced extremely severe anxiety. As for stress, 51% (n = 123) had normal levels, 10.4% (n = 25) severe, and 5.8% (n = 14) extremely severe symptoms.

Table 5. Percentages of people experiencing depression, anxiety, and stress

	Depression	**Anxiety**	**Stress**
Normal	121 (50.2%)	111 (46%)	123 (51%)
Low	27 (11.2%)	35 (14.5%)	30 (12.4%)
Moderate	52 (21.6%)	33 (13.7%)	49 (20.4%)
Severe	22 (9.1%)	27 (11.3%)	25 (10.4%)
Extremely severe	19 (7.9%)	35 (14.5%)	14 (5.8%)

Correlational Analysis

Table 6. Pearson correlations, descriptive statistics, and α coefficients (N = 241)

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Measure**	**Mean**	**SD**	**α**
Age	-.151*	.002	-.137*	-.258**	-.011	.018	.061	-.215	-.223**	-.195**				
1. Avoidance coping		.158*	-.090	.799**	-.011	-.031	.393**	.557**	.480**	.474**	Brief Cope	25.44	4.88	.70
2. Approach coping			.355**	.548**	.400**	.312**	-127*	-.175**	.005	-.013	Brief Cope	36.79	5.23	.80
3. Self-Awareness					.655**	.491**	-.126*	-.240**	-.138*	-.132*	SECDI	57.24	9.04	.88
4. Consideration of Others						.328**	-.216**	-.227**	-.174**	-.181**	SECDI	54.93	8.23	.82
5. Connection to Others						.667**	-.185**	-.333***	-.132*	-.116	SECDI	49.80	9.86	.83
6. Influence Orientation							-.024	-.183**	-.051	-.080	SECDI	45.54	11.35	.88
7. Irrationality								.331**	.339**	.359**	GABS	22.67	4.17	.91

Variables	1	2	3	4	5	6	7	8	9	10	Measure	Mean	SD	α
8. Depression									.415**	.713**	DASS 21	17.39	4.31	.88
9. Anxiety										.648**	DASS 21	22.77	2.84	.85
10. Stress											DASS 21	22.08	5.13	.89

*p < .05, **p < .01.

Table 6 presents correlations between the studied variables, and also lists descriptive statistics and internal consistency coefficients (Cronbach Alpha).

Age indicated a significant and negative association with depression (*r* = - .21, p < .01), anxiety (r = -.22, p < .01) and stress (*r* = -.19 p < .01), meaning that the younger the age, the more prone someone is to experience those states, and they decrease as people advance in age. As expected, avoidance coping was significantly and positively associated with irrationality (*r* = .39, p < .01), depression (*r* = .55, p < .01), anxiety (*r* = .48, p < .01), and stress (*r* = .47, p < .01). The relation between irrationality and approach coping was significant yet negative (*r* = -.12, p < .05), showing that the lower the level of irrationality, the more someone will use an approach coping.

Approach coping was positively and significantly associated with self-awareness (*r* = .35, p < .01), consideration of others (*r* = .40, p < .01), connection to others (*r* = .41, p < .01) and influence orientation (*r* = .31, p < .01) and negatively significantly associated with the depression factor of DASS21 (*r* = - .17, p < .01) which means that the better someone is at coping the less prone is to become depressed.

Connection to others, which is characterized by sociability and intimacy, was significantly and negatively connected to depression (*r* = - .33, p< .01). Influence Orientation was negatively and significantly associated with depression (*r* = - .18, p < .01) which means that the more prone you are in taking initiative, trying new things, and motivating others to be inspired by your example, the less depressed you will be. Age was negatively associated with avoidance coping (*r* = - .15, p < .05), and positively associated with self-awareness (*r* = .13, p < .05). Irrationality was positively and significantly associated with depression (*r* = .33, p < .01), anxiety (*r* = .33, p < .01), and stress (*r* = .35, p < .01). Self-awareness, consideration of others and connection to others were negatively and significantly associated with irrationality (*r* = - .12, p < .05; *r* = - .21, p < .01; *r* = - 18, p < .01) and anxiety (*r* = - .13, p < .05; (*r* = - .17, p < .01; *r* = - .13, p < .05) (only in connection to self-awareness), showing that someone with a low level of irrational thinking can have a better control over emotions.

In terms of differences between men and women, we noticed no differences on any of the scales or subscales used in the study (Table 7). Because there was a big difference in the sample size regarding men and women, we randomized samples from the women group several times, and each time, the results indicated no differences from the men. Which means that both men and women used the same coping strategies and social-emotional competences. Also, the levels of depression, anxiety and stress are very similar for both genders.

Table 7. Gender differences

Scale/subscale	t	Sig.	Scale/subscale	t	Sig.	Scale/subscale	t	Sig.
GABS			B COPE			B COPE		
Rationality	.936	.352	Self-distraction	-.309	.758	Positive reframing	-.253	.801
Own global evaluation	-.730	.467	Active coping	-1.662	.100	Planning	-1.095	.277
Achievement	-.888	.377	Denial	-2.631	.010	Acceptance	.404	.688
Approval	-1.096	.277	Substance use	1.485	.142	Self-blame	1.523	.132
Comfort	-.812	.419	Emotional support	-.245	.731	Avoidance	.096	.924
Demand for justice	-1.031	.306	Use of info support	.073	.942	Approach	-.747	.457
Others global evaluation	.449	.655	Behavioral disengagement	1.223	.225	Religion	-1.305	.196
Irrationality	-.957	.341	Venting	-2.007	.048	Humor	2.384	.020
SECDI			SECDI			DASS21		
Self-awareness emotions	-1.173	.244	Connection with others – Sociability	-1.072	.287	Depression	.709	.480
Self-awareness Aptitude	-.622	.536	Connection with others – Intimacy	-2.974	.400	Anxiety	-.814	.418
Consideration of others - Empathy	-1.537	.128	Influence orientation - Initiative	.049	.961	Stress	-1.343	.183
Consideration of others - Monitoring	-2.133	.036	Influence orientation - Inspiration	-.356	.723			

Regression analysis of rationality/irrationality

Because we noticed a significant and positive association between irrationality and the concepts of depression, anxiety, and stress, we continued our analysis with an in-depth correlation analysis between all the dimensions of irrationality (need for achievement, need for approval, need for comfort, demand for fairness, self-downing, other downing) and the three previously mentioned concepts. Also, we noticed a negative and significant association between depression, anxiety and stress and rationality. Simply put, these data show what the REBT theory also proved, that if you approach a rational thinking style, then it is less probably to suffer from depression, anxiety, or stress and vice versa, an irrational thinking style will increase the likelihood of such problems.

Table 8. Correlation analysis or rationality/irrationality and depression, anxiety, and stress

Variables	1	2	3	4	5	6	7	8	9	10	11	Mean	SD
1. Rationality		-.240**	-.100	-.258**	-.276**	-.038	-.322**	-.159*	-.279*	-.241**	-.236**	15.95	2.23
2. Total Irrationality			.811**	.799**	.832**	.788**	.672*	.639*	.331**	.339**	.359**	60.48	13.01
3. Need of achievement				.548**	.626**	.599**	.472**	.322**	.336**	.318**	.346**	12.07	3.43
4. Need of approval					.616**	.569**	.502**	.480**	.195**	.260**	.265**	7.86	2.36
5. Need for comfort						.539**	.585**	.418**	.309**	.314**	.321**	10.71	2.82
6. Demand for fairness							.270**	.532**	.213**	.242**	.278**	13.07	3.32
7. Self-downing								.267**	.275**	.273**	.271**	8.98	2.75
8. Other downing									.150**	.108**	.121**	7.79	2.39
9. Depression										.713**	.736**	5.79	4.68
10. Anxiety											.747**	4.94	4.32
11. Stress												7.98	4.70

*p < .05, **p < .01

Then, we decided upon conducting multiple regression analysis to establish which of the irrational beliefs categories better predict depression, anxiety, and stress significantly. As can be seen in table 9, results show that depression was significantly predicted by the need for achievement (B = .363, *SE* = .094, *p* < .001) and self-downing (B = .255, *SE* = .117, *p* < .05). These two dimensions of irrational beliefs (need for achievement and self-downing) account for 13% of the variance for depression. Anxiety was significantly predicted by the need for achievement (B = .400, *SE* = .077, *p* < .001) and need for comfort (B = .290, *SE* = .119, *p* < .05). These two dimensions of irrational beliefs (need for achievement and need for comfort) account for 12% of the variance for anxiety. Stress was significantly predicted by the need for achievement (B = .326, *SE* = .106, *p* < .001) and need for comfort (B = .287, *SE* = .129, *p* < .05). These two dimensions of irrational beliefs (need for achievement and need for comfort) account for 14% of the variance for stress.

Table 9. Regression analysis for irrationality subscales and depression, anxiety and stress

		Depression		
Predictor	**B**	**SE**	**t**	**R^2 model**
Need for achievement	.363	.094	3.87**	13**
Self-downing	.255	.117	2.7*	
		Anxiety		
Need for achievement	.400	.077	5.18**	12**
Need for comfort	.290	.119	2.43*	
		Stress		
Need for achievement	.326	.106	3.08**	14**
Need for comfort	.287	.129	2.23*	

*p < .05; **p < .001

To investigate the research question about the relationship between cognitive processes and depression, anxiety and stress, a moderation analysis was performed using PROCESS macro in SPSS. The outcome variable of the analysis was the level of depression, anxiety and stress, the predictor variable was the level of irrationality, and the moderator variable was the level of rationality (Table 10).

Table 10. Moderation role of rational beliefs

	Depression			
Predictor	**B**	**SE**	**t**	**R^2 model**
Irrational beliefs (IB)	.36	.11	3.11**	17**
Rational beliefs (RB)	.57	.46	1.23*	
IB x RB	-.01	.00	.02	
	Anxiety			
Irrational beliefs (IB)	.26	.11	2.42**	12**
Rational beliefs (RB)	.31	.42	.72*	
IB x RB	-.01	.00	-1.5	
	Stress			
Irrational beliefs (IB)	.31	.11	2.65**	14**
Rational beliefs (RB)	.42	.46	.91*	
IB x RB	-.01	.00	-1.7*	

For the relationship between irrational beliefs and depression, the results of the moderation analysis showed that irrational beliefs (B = .36, SE = .11, p < .001), and the interaction effect of the irrational and rational beliefs was significant too (B = -.01, SE = .01, p < .05). Regarding the relationship between irrational beliefs and anxiety, the results of the moderation analysis indicated a significant effect of irrational beliefs (B = .26, SE = .11, p < .05), and the interaction effect between the irrational and rational beliefs. As for the relationship between irrational beliefs and stress, the results of the moderation analysis showed that irrational beliefs (B = .31, SE = .11, p < .001), and the interaction effect of the irrational and rational beliefs was significant too (B = -.01, SE = .01, p < .05).

As can be seen from figure 1, the results show that the relationship between irrational beliefs and depression / anxiety / stress is stronger when the level of rational beliefs is low.

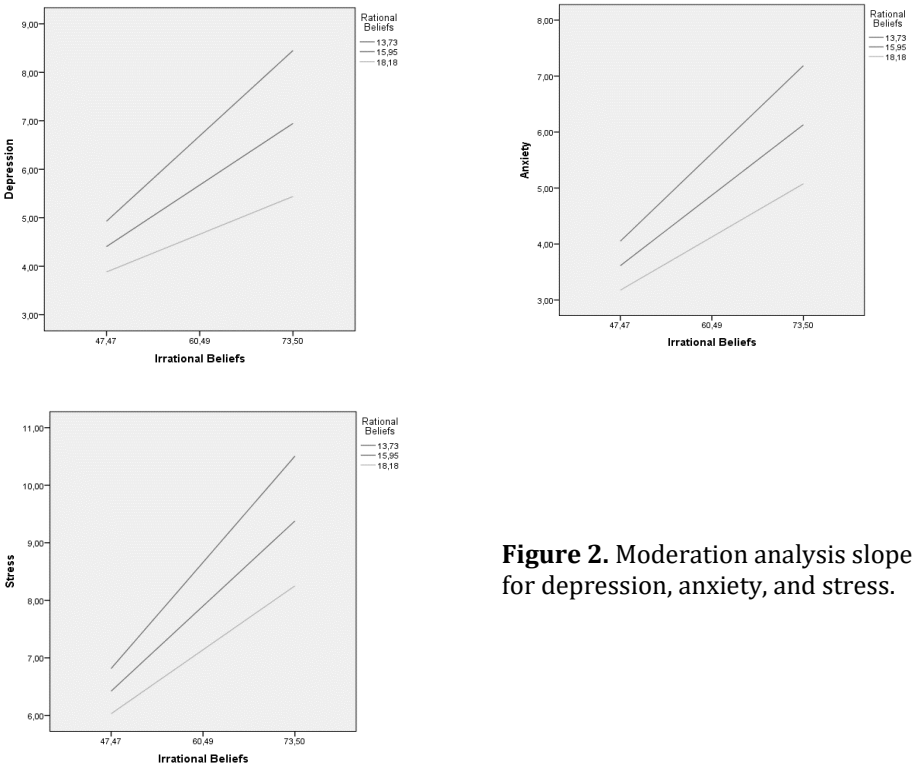

Figure 2. Moderation analysis slope for depression, anxiety, and stress.

Discussion

GABS scale

Related to GABS scale, results showed that most of the sample had an above average level of rationality (158 respondents or 65,6%), while 54 respondents (22.4%) indicated an average rationality. This is conclusive with the results achieved on the same scale on the level of irrationality, where almost half of the respondents (46.5%) experienced a very low or low level of irrationality, while 31.1% had an average level and 22.4% a high or very high level or irrationality. We remind the reader that this scale measures the general attitudes beliefs as seen in the Rational Emotive Behavior Therapy developed by Ellis (1979), on 7 factors (Rationality, Self-Downing, Need for Achievement, Need for Approval, Need for Comfort, Demands for Fairness, Other Downing).

Since we made the evaluation at the beginning of the pandemic, it is expected to have a lower level of irrationality and a high or moderate level of rationality in the respondents. Future investigations are needed to evaluate whether the level of irrationality has increased, now when more than one year has passed since the beginning of the worldwide pandemic.

Coping strategies

Most respondents used positive strategies in coping with Covid-19 and were less engaged in harming behaviors. Our results are conclusive with other recent studies (Park, Russell, Fendrich, Finkelstein-Fox, Hutchinson, & Becker, 2020) which unveiled that some of the main strategies for coping with the Covid-19 situation were self-distraction, active coping, and social-emotional support. Emotional support regards empathy, encouragement, and kindness (Saha, Torous, Caine, & De Choudhury, 2020) and is paramount in times of crisis, along with informational support, which is about information and guidance.

Positive reframing, planning and acceptance were three other types of approach coping strategies used by the participants in this study, and they are significantly and positively associated with reducing stress and adapting to aversive situations (Shanahan, Steinhoff, Bechtiger, Murray, Nivette, Hepp, Ribeaud, & Eisner, 2020). Positive reframing is the ability or behavior of perceiving in a positive light something that was previously seen as negative (Lambert, Fincham & Stillman, 2012) and was used by 82.2% of the respondents in our study. Planning is seen as a means of devising a strategy and considering the necessary steps to take, and in our study, it was used by 75% of the respondents, which is consistent with other studies on the topic (MacIntyre, Gregersen, & Mercer, 2020).

Acceptance coping is seen as a strategy that allows you to relate to uncontrollable events in an accepting manner, by learning to change the narrative concerning those events and adopting an adaptive response (Polizzi, Lynn & Perry, 2020). In our study, the acceptance coping was used by a large number of respondents (85%), thus proving that people turned to the right type of strategies to cope with the unknown and adapt to adversity (Linley & Joseph, 2004; Zhang, Chung & Bu, 2017).

It seems that religion is not seen as a strategy in coping with Covid-19 pandemic, in opposition with humor which acts as a mechanism of coping and has an important role in dealing with pandemic threat. Somehow, our results can be explained by Kranz et al. (2020) who found that higher levels of religiosity predict unreasonable behavior in relation to Covid-19 pandemic and emotional responses, which for our sample was not the case.

Depression, anxiety, and stress

Like other studies our results showed that severe and moderate levels of depression, anxiety, and stress are present but in our case for a low percentage of respondents (Alzueta et al., 2020; Wang et al., 2020). Half of the respondents experienced normal levels of depression, anxiety, and stress, which means that there are no concerns. Regardless of the results, it is important to remember that DASS21 is a quantitative measure of distress and not a measure for clinical diagnosis. Therefore, even a moderate level is still below a clinical threshold. With this information in mind, it is comforting to notice that a small proportion of the respondents have experienced depression, anxiety, or stress at an extremely severe level. This has to do, of course, with their approach coping style and social-emotional competences, which allow them to use specific coping strategies such as positive reframing and acceptance, or emotional regulation. This does not mean that people in the Covid-19 Pandemic have not been affected by the situation. Rather than, with the proper coping style and competences, any adversity can be overcome.

Correlational analysis and regression

Results showed negative association between age and depression, anxiety and stress and positive association between avoidance coping and irrationality, depression, anxiety, and stress. This is something to be expected because, compared to approach coping, this type of avoidance coping is less effective at managing anxiety and stress. Avoidance coping is comprised by the subscales of denial, substance use, venting, behavioral disengagement, self-distraction, and self-blame, most of which are also encountered in the concept of irrationality, as approached in the theory of Rational Emotive Behavior Therapy or REBT (DiGiuseppe, Doyle, Dryden, & Backx, 2013).

Approach coping was positively and significantly associated with subscales of self-awareness, consideration of others, connection to others and influence orientation, and negatively significantly associated with the depression factor of DASS21, which means that the better someone is at coping the less prone is to become depressed. This is also expected, since the approach coping encompasses scales of active coping, positive reframing, acceptance and seeking emotional control, which lead to a better response to adversity and better emotional responses. This is similar to other research which found that in coping with the pandemic, people are not passive but are putting all their efforts into making the context more tolerable (Taylor et al., 2020).

Moreover, connection to others was negatively correlated with depression, meaning that the more social respondents were to other people in general and in times of adversity such as the Covid-19 pandemic, the less prone they were to become depressed. Also, one of the SECDI subscale, the influence orientation which refers to the ability to motivate others was negatively associated with depression. These results are in line with previous research which showed that social connection has the potential to mitigate the negative psychological consequences of the pandemic (Tull et al., 2020; Wu, 2020).

In line with previous studies, we observed positive correlations between irrationality and depression, anxiety, and stress, meaning that the more someone is predisposed to irrational beliefs, the more they will face depression, stress and anxiety (Oltean et al., 2017; Vîslă et al., 2016; Balkis & Duru, 2019; Chan & Sun, 2020; Goyal et al., 2020). In the ABC model of REBT therapy, irrational beliefs refer to catastrophizing thoughts about the self. In the context of Covid-19 pandemic, among other factors the fear about personal health or the fear of infecting others or the stigma associated with having the disease can act as triggers for psychological stress which may develop anxiety and depression (Brooks et al., 2020; Rajkumar, 2020; Sanderson et al., 2020).

In relation to this the results of the regression analysis are congruent with data from other studies (Balkis & Duru, 2019), and the REBT theory (Ellis, 2003b). Also, they are expected in the times of novelty and uncertainty such as the Covid-19 pandemic when most of the world population was confined to work from home and adapt to a new reality of communication and telework. In this new reality, we see three main predictors for depression, anxiety, and stress, and those are the irrational beliefs of need for achievement, need for comfort and self-downing. Since everyone became their own boss in the work from home reality, we see no need for approval as a predictor for depression, anxiety, and stress, and the demand for fairness is lacking, since everyone is in the same situation. Also, other downing is also low or non-significant because there is no one to blame, except for the virus itself. Of course, we exclude from this equation the people that believe in the conspiracy theories, and which might consider others to blame for the whole virus situation.

Although worldwide an increase in the level of irrationality and other psychological problems was expected, our study shows that it is not the case. People managed to maintain their level of irrationality low and their level or rationality moderate or quite high. Also, we did not encounter an increase in the levels of depression, anxiety, or stress, investigated with DASS21. Only 9.1% experienced severe depressive symptoms, 5.8% experienced severe anxiety and 5.8% extreme stress, which is way below the general worldwide average.

Another variable is related to the area of living. For those living in urban areas, the COVID-19 pandemic is affecting more strongly the mental health status (Özdin & Özdin, 2020). Moreover, the environment in which the person is in isolation is another important factor. Those who lived alone had lower stress scores than those who lived with one or more other people (Taylor et al., 2020). On the contrary, we did not find any data to support the previous statement, and there were no differences between those who lived alone and those who lived with someone, in terms of depression, anxiety or stress. However, interesting enough is that we noticed a significant difference in the scores between those who lived alone and those who lived with someone in the same house, during the pandemic lockdown, namely that those living with other people used more often positive reframing ($t(239)=2.349$, $p=.05$) and experienced a higher level of rationality ($t(239)=2.065$, $p=.05$).

Also, the place that people were isolated in had a great importance. Those who lived in apartments experienced a stronger feeling of injustice, because they felt that a basic right was taken away, namely the right to travel or go outside their house. Those living in a house, experienced a much lower level of injustice or none. An independent-samples t-test was conducted to compare the level of general attitude beliefs, in two conditions - people living in apartments during the pandemic lockdown and people living in houses (with or without a yard). There was a significant difference in the scores for *need for justice* subscale, from the General Attitude Beliefs Scale (GABS): $t(239)=-3.323$, $p=.001$. Besides this, there were no other differences regarding the respondents, on the other scales and subscales.

Of course, there is caution when looking at these data, because of the lower number of respondents and the timing of the evaluation. It is possible that re-evaluating these concepts one year later, we will discover different values, with a possible increase in depression, especially for the categories of people that live marginalized from society, in remote areas or for elderly people. Also, an increase in anxiety and stress is expected because more time has passed than most of us have initially estimated it would, regarding the pandemic. We therefore intend to do this study again on a larger sample, to analyze whether things have changed one year later. Also, we are interested to discover what people have learned after living for one year with the Covid-19 virus and this sort of new world order.

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