

## THE IMPACT OF THE COVID-19 PANDEMIC ON MOOD: A LONGITUDINAL ANALYSIS OF ATTRIBUTIONAL STYLE AND SATISFACTION WITH LIFE IN STRESSFUL SITUATIONS

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### *Abstract*

*Learned helplessness may be the underlying cause of depression, a mood that was common among the general population during the COVID-19 pandemic. Decreased life satisfaction and increased frequency of daily hassles may have a bearing on the relationship between learned helplessness and depression in a pandemic context. A sample of 387 participants (190 men and 197 women) with a mean age of 24.48 (SD=8.46) completed the Attributional Style Questionnaire (ASQ), The Multidimensional Scale of Perceived Social Support (MSPSS), Survey of Recent Life Experiences (SRLE), Satisfaction with Life Scale (SWLS) and the Subjective Impact of the COVID-19 Pandemic. The longitudinal design of the study entailed a series of comparisons using independent t-test and ANOVA with repeated measures. In addition, data processing involved constructing an explanatory model (structural equation modelling - SEM) to explore key factors that contribute to the development of depressive disorders. We interpret depression during the pandemic from the perspective of negative attributional style, daily hassles, satisfaction with life and participants' subjective perception of the pandemic. The study helps to understand how learned helplessness contributed to mental health issues during the COVID-19 pandemic. The findings suggest that depression during the pandemic was causally driven by the maladaptive attributional style that may lead to misinterpretations of events that impact satisfaction with life. The study can inform health policies as well as future psychotherapeutic and clinical research.*

Keywords: helplessness; depression; daily hassles; satisfaction with life; COVID-19

### **Introduction**

Most likely, social media and various more or less official news channels rendered the debate about the pandemic, official (sometimes contradictory) communication, and restrictions (previously unencountered by younger people

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who did not live through the “age of communism”) almost unavoidable in many countries.

Maintaining social distance, closed schools, universities, and institutions, and family isolation are common measures to curb the spread of the virus that can effectively slow the spread of COVID-19 (Wu et al., 2020). China was the earliest country to adopt these measures and has achieved promising results in effectively curbing the spread of the epidemic (Kraemer et al., 2020). Nevertheless, the resulting changes in behavioural patterns and emotional functioning had a non-negligible impact on mental health (Browning et al., 2021). Studies have pointed out that the deterioration of mental health during the COVID-19 epidemic was not only rooted in fear of contracting the disease but was also associated with measures to curb the virus, such as social isolation (Xiao et al., 2020; Pellicano et al., 2022). College (and school) students during lockdown were faced with the routine of online learning, changes in assessment and examination approaches, and a new manner of interacting with teachers (Sahu, 2020; Vigil et al., 2020; Canet-Juric et al., 2021; Scarzello et al., 2022) and uncertainty about educational or professional prospects (Huang & Zhao, 2020; Marian et al., 2022), leading to higher levels of anxiety and symptoms of depression (Charbonnier et al., 2022; Akova, Kiliç, & Özdemir, 2022). On the other hand, certain symptoms that had remitted after psychological or psychiatric treatment worsened by re- or extended lockdown (Parker et al., 2022) and by reduced perception of social support (Marian et al., 2022; Ahrens et al., 2021).

In the classical conceptualization of hopelessness depression, people in complex situations feel that any effort aimed at constructive change (Alloy et al., 1988; Abramson et al., 1989) is doomed before it is even attempted (Shea & Hurley, 1964). Conversely, Seligman and other researchers conceptualised hopelessness as the conviction that everything that can be done has been done, which results in an inability to mobilize energy and effort (Shea & Hurley, 1964; Maier & Seligman, 1976; Marian, 2011). It is hardly surprising that challenging times (such as the pandemic of 2020-2022) may induce states of both hopelessness and helplessness resulting in potential psychopathological vulnerability. Furthermore, stressors may cause us to “rubber band” back to negative emotions from our own past, further compromising our mental wellbeing (Kanner et al., 1981; DeLongis et al., 1982; Lazarus, 1999).

The learned helplessness theory claims that individuals repeatedly experience frustrations but cannot change the situation; in other words, learned helplessness is “the internalisation of stable causes after failure” (Abramson et al., 1978). Individuals will lower their expectations of change when they learn that the behaviour will not lead to the desired outcome, resulting in a loss of motivation to respond to adverse situations proactively. After multiple failed attempts to influence a situation, individuals learn “response-outcome independence,” which is the basis for developing learned helplessness (Maier & Seligman, 1976). Studies from the COVID-19 pandemic have shown that frequent shelving or alteration of short and long term plans due to uncertainty

and instability in the development of the epidemic may cause intense feelings of helplessness (Beato, da Costa, & Nogueira, 2021; Xue et al., 2023). Other studies have shown that a lack of a sense of control over environmental events may also lead to learned helplessness (Overmier & Seligman, 1967; Fassett-Carman, Hankin, & Snyder, 2019). We believe that the uncontrollability of the aversive event, rather than the aversive event itself, leads to learned helplessness and seriously reduced well-being (Wanke & Schwabe, 2020).

We consider that stressful events as those that are seen as relevant as harmful or threatening for the individual, and therefore beyond the individual's capacity to respond appropriately. Therefore, not all events will be equally stressful for individuals in all circumstances. Included in the conceptualization of stress, daily hassles are considered in the literature as a process that unfolds and exerts its effects over time (Kanner et al., 1981; Wright et al., 2020).

Cumulatively, each simple hassle adds to the previous ones, generating a summum that could indicate a life-changing score only if they are important and meaningful to the person. The impact of a hassle depends on its cumulative effect or its content and meaning in the person's life. Unfortunately, such conditions were in place during the COVID-19 pandemic.

A limited number of studies have investigated common annoyances at a descriptive level without providing information on antecedents and consequences. On the other hand, longitudinal analyses of daily hassles have led to the idea that they are significantly connected with psychological symptoms. The findings of DeLongis et al. (1982) indicate a relationship between daily stress and mental illness, but do not allow for the examination of daily hassles as possible stressors impacting physical health. Nevertheless, the assumption that mental and physical illness have necessarily the same set of antecedents in the COVID-19 pandemic cannot be supported. Hypothetically, it may be beneficial to demonstrate the relationship between stress and mental illness in the pandemic by extending the predictions to physical health, as a common stressor may be identified. One hypothesis tested in pandemics (Wright et al., 2020; Klusmann et al., 2021; Hargreaves et al., 2021) was the relationship between daily hassles (as proximal factors) and physical health, downplaying the importance of major life events as distal factors. Also noteworthy is the distinction between a person's perception of the social environment (Marian et al., 2021) as a proximal variable and the characteristics of the environment (distal factors) that may or may not be perceived as such by the person.

Some of the longitudinal studies published in the last three years support the prevalence of mental health problems and an increase in the incidence of depression, anxiety or behavioural disorders during the pandemic. Other studies show that satisfaction with life (Marian, Oprea, & Dărăbăneanu, 2020; Brogårdh et al., 2021; Shpakou et al., 2022) and well-being (Kanekar & Sharma, 2020; Lades et al., 2020; O'Connor et al., 2021; Parker et al., 2022; Zaninotto et al., 2022) did not change during lockdowns, except for an increase in the frequency of loneliness (Bonsaksen et al., 2022; Stubbs & Achat, 2022). Depending on

research design, predictors frequently analysed in lockdowns were demographic and lifestyle variables in relation to age, gender, life without a partner, chronic disease, education level, income, occupation, etc. (Marian et al., 2021; Dale et al., 2022; Marian et al., 2022).

Previous studies have clearly shown that the effects of daily hassles are different, and that lack of control of even mildly aversive stimuli can lead to mood changes (*e.g.*, tension, stress, unhappiness, anxiety, and depression), and changes in the neuroendocrine and autonomic nervous systems in healthy subjects (Breier et al., 1987; Xue et al., 2023). Hypothetically, perhaps because control perception leads individuals to believe that future threats can be minimized (Marian et al., 2022; Mittelstädt et al., 2022). Few studies showed that participants tended to attribute feelings of helplessness to a loss of control over their lives, such as the instability of lockdown measures and uncertainty about the duration of the measures (Shaw, 2020; Zuo et al., 2021; Aguglia et al., 2021; Xue et al., 2023).

In conclusion, can contribute to feelings of helplessness and mental health problems, particularly depression. The instability and uncontrollability of the epidemic and the duration of the lockdown made people lose expectation and have lower satisfaction with life, against a backdrop of reduced social support that eventually induced depression.

## **Objectives**

In this study we explore the relationship between negative attributional style and depression in the pandemic, as well as the mediating role of life events and satisfaction with life in the onset and maintenance of depression. The subjective impact of the pandemic plays an important role in the development and maintenance of depression.

We examine how changes in attributional style, perceived social support, satisfaction with life and daily hassles occurred in people who reported SARS-Cov-2 infection in 2020, 2021 and 2022, during the pandemic. We also track changes of depression in individuals who had COVID-19 in 2020 and in individuals who did not have the disease but faced the restrictions pandemic-related restrictions.

The operationalisation of the concept of negative attributional style in the study is based on three sub-constructs: negative internal attributions, negative stable attributions and negative global attributions. We believe that reduced satisfaction with life is caused by negative attributional style, and by everyday hassles that have significant impacts on mood during the pandemic.

## **Method**

### *Participants*

The scales were administered to 387 participants aged 18-59 years ( $m=24.48$ ;  $SD=8.46$ ). Two samples were set up, generically referred to as the

“COVID-19 group” and “non-COVID-19 group”. The sample of 387 respondents is balanced in terms of gender and background (*see* Table 1).

### *Measures*

The theoretical model presented above was implemented by applying a three-tier scale package to respondents surveyed between 2021-2022.

*The Attributional Style Questionnaire* (ASQ; Peterson et al., 1982) was used to measure attributional style, which reflects the respondents' manifest tendency to select causal explanations for favourable or unfavourable events. The internal consistency was .82 for positive events and .72 for the negative events (Marian, 2010; Marian et al., 2021).

*Perceived social support* was measured with The Multidimensional Scale of Perceived Social Support (MSPSS), which contains three subscales (Zimet et al., 1988; Marian et al., 2021; Marian et al., 2022). The subscales relate to different sources of social support, such as family, friends and significant others. A good internal consistency of between .91 and .94 is indicated by the coefficients reported in previous surveys (Marian et al., 2021; Marian et al., 2022).

*Satisfaction with Life Scale* (SWLS; Diener et al., 1985) is based on a single factor (contains 5 items) and is widely used as a measure of satisfaction with life, which in turn is a component of subjective well-being (Marian et al., 2021; Marian et al., 2022). The survey scale is reliable in all published studies (Pavot & Diener, 2008; Caycho-Rodríguez et al., 2018).

*Recent life events* were measured using the Survey of Recent Life Experiences (SRLE; Kohn et al., 1992), which includes the following factors: social and cultural difficulties, time pressure, work, finance, social victimization, and social acceptability. The survey uses the short version of the SRLE (with 41 items) to measure problems accumulated over a period of time. The internal consistency of the total score was .90, in line with other previous studies (Kohn et al., 1992; Marian, 2011; Marian et al., 2021; Marian et al., 2022).

Respondents were asked about their *health status* before the onset of the pandemic and whether or not they were infected with SARS-Cov-2. The *subjective impact* of the pandemic was measured on a Likert scale from 1 (not at all important) to 7 (extremely important). Respondents were asked “How important is the current situation for you mentally and socio-economically” targeting the thinking, emotions, behaviour and social plan that might be fostering the depression-specific negative halo.

### *Procedure*

The survey scales were administered to voluntary research respondents from 2020 (during the lockdown imposed by the national authorities) onwards. The survey scales were created electronically and distributed in Google docs format. A non-probability sample was created in 2020 using the snowball sampling method. The participants were asked to recommend other potential respondents who might be willing to take part in the research. A large share of the respondents were from the western part of Romania, from both urban and

rural areas. The respondents were given a brief explanation of the purpose of the research and were assured of confidentiality. In addition, respondents who agreed to take part in the survey in 2020 were told that another phase of the research would follow after one year, which at that time was considered to be post-pandemic. In 2022, the respondents were asked to complete the survey scales again. On request, they were forwarded the results for the three years of the pandemic.

The researchers sought information on attributional style, daily hassles, perception of social support, satisfaction with life, subjective impact of the pandemic generated by the media (audio-visual media, social media, etc.), and depressive mood in people who had been diagnosed with COVID-19 or repeatedly tested positive, and in people who were infected with SARS-Cov-2.

The instructions required respondents to complete the scales according to how they perceived themselves during the pandemic, in particular, in situations where their freedom of movement was restricted.

#### *Data analysis*

We use a longitudinal design in the study, aiming to measure changes in a set of variables during the COVID-19 pandemic at three points in time (2020, 2021 and 2022).

Using structural equation modelling (SEM), the study aimed to develop a workable model of learned helplessness during the pandemic. A set of essential factors (*e.g.*, negative attributional style, daily hassles, satisfaction with life, subjective impact of pandemic, etc.) that influence depression in pandemic ultimately led to the development of an explanatory model. SEM is a method that allows testing specific hypotheses about the relationship between manifest variables in our study (Hoyle, 1995; Hair et al., 2006; Kline 2023). Furthermore, SEM allows the assessment of number of relationships between variables. At the comparative level, with independent t-test, and analysis of variance (ANOVA), the study focused on the differences between different groups (*e.g.*, gender, education level, marital status, etc.) in terms of depression reported in 2020. The study follows longitudinal changes in scores on the variables depression, satisfaction with life, daily hassles, and perceived social support over three years, in relation to the respondents' classification into the two groups: with and without COVID-19. In this case we used Repeated Measures ANOVA (looking for “within- and between-subjects effects”) and the W Mauchly test (to confirm that the assumption of sphericity was met). In the case of the negative attributional style that was measured in 2020 and 2021 we use the paired samples t-test. An important step was the correlational analysis of the relevant variables that can support the final SEM model.

Incomplete responses for 2020 and later years were eliminated in the first phase of the survey. Respondents who contracted COVID-19 or tested positive at least three times in 2020 were included in the study. Respondents who contracted COVID-19 in 2021 or 2022 were not included in the study, being actually removed from the study, as they were deemed to introduce bias into the

results. Only the healthy respondents who did not experience illness or test positive between 2020 and 2022 remained.

The research focuses on the longitudinal changes of the variables presented above during the pandemic and on the construction of the SEM model of learned helplessness.

The SEM model integrates manifest variables that can statistically support the study of the causal relationship between negative attributional style and depression. Statistically, in the SEM model we examined the goodness-of-fit coefficient that assesses the extent to which there is a fit between the theoretical model and the estimation parameters proposed in the study (Hoyle, 1995; Hair et al., 2006; Kline 2023). The model, implemented according to statistical requirements, used as indicators the chi-square/degree of freedom ( $\chi^2$ /df), goodness-of-fit index (GFI), adjusted GFI (AGFI), root mean square residual (RMR), root mean square error of approximation (RMSEA), the Tucker-Lewis Index (TLI), and comparative fit index (CFI).

## Results

### *Socio-demographic indicators*

In preparation for interpreting the data according to the objectives outlined above, the exploratory factor analysis (EFA) was used to check the accuracy of the recorded data. Also, the One-Sample Kolmogorov-Smirnov Test (Berger & Zhou, 2014) was applied to examine the data for normality of distribution, indicating that parametric statistical tests could be used.

Table 1 shows basic information on the sample of respondents aged 18 to 59 who agreed in 2020 to participate in the research ( $m=24.48$ ;  $SD=8.46$ ). The gender ratio is balanced (49.1% male and 50.9% female), indicating that the sample was adequately defined. The respondents were high school graduates (12.4%), college graduates (24.8%) and university students (62.8%). Marital status: 61.5% of respondents stated that they were single at the onset of the pandemic, 36.4% were married, and only 2.1% were divorced or widowed. 48.1% of the respondents were from rural and 51.9% from urban areas, a variable that is difficult to quantify accurately given the access to specific urban facilities.

Two clinical variables were relevant to the research: first, how respondents rated their health status in the first year of the pandemic, and second if they had coronavirus disease (COVID-19) in 2020. Thus, 19.6% of the respondents reported that they were in very good health, 70.5% that they were in good health, and 9.8% that they suffered of chronic diseases in the first year of the pandemic, which suggests that respondents were cautious about the possibility of having had COVID-19 during the pandemic. 71.6% of the respondents who had several tests reported that they were COVID free between April and September 2020, and 28.4% of the respondents reported that they had the disease without having been hospitalized without COVID-19 in the same period.

Table 1. Sample distribution and percentages in 2020

Variable	Category	N	%
Gender	1. Male	190	49.1%
	2. Female	197	50.9%
Education level	1. High school	48	12.4%
	2. College	96	24.8%
	3. Students (BA, MA)	243	62.8%
Marital status	1. Single	238	61.5%
	2. Married	141	36.4%
	3. Divorced	8	2.1%
Geographical distribution	1. Rural	186	48.1%
	2. Urban	201	51.9%
Health status in 2020	1. Very good	76	19.6%
	2. Good	273	70.5%
	3. Chronic diseases	38	9.8%
Coronavirus disease (COVID-19) in 2020	1. no	277	71.6%
	2. yes	110	28.4%

Aiming to eliminate potential biases and to clarify the differences between the subcategories included in the study, we conducted a series comparisons based on independent sample t-tests and one-way analysis of variance (ANOVA) in relation to depression (Table 2).

Table 2. Difference analysis of depression in the first phase of the pandemic (2020)

Variable	Category	Means/SD	t/F Value
Depression (2020)	Gender		
	1. Male	1.43 / 0.85	1,423
	2. Female	1.35 / 0.82	
Depression (2020)	Education level		
	1. High school	1.57 / 0.82	1,579
	2. College	1.37 / 0.82	
	3. Students (BA, MA)	1.33 / 0.84	
Depression (2020)	Marital status		
	1. Single	1.36 / 0.84	0,232
	2. Married	1.38 / 0.83	
	3. Divorced	1.19 / 0.65	
Depression (2020)	Geographical distribution		
	1. Rural	1.27 / 0.82	-2,326*
	2. Urban	1.47 / 0.83	
Depression (2020)	Health status in 2020		
	1. Very good	1.46 / 0.78	2,074
	2. Good	1.38 / 0.86	
	3. Chronic diseases	1.13 / 0.70	
Depression (2020)	Coronavirus disease (COVID-19) in 2020		
	1. no	1.19 / 0.79	-7.023***
	2. yes	1.82 / 0.77	

Note: \*p<.05; \*\*\*p<.001

The t-test on the variable “gender” reported by the research respondents showed no significant differences [t(385)=1.423; p=.155] thus supporting



homogeneity in terms of depression but also in terms of education [ $F(2, 386)=1.579$ ;  $p=.207$ ] or marital status [ $F(2, 386)=0.232$ ;  $p=.793$ ].

On the other hand, urban dwellers participating in the research showed higher levels of depression compared to those from rural areas [ $t(385)=-2.326$ ;  $p<.05$ ], probably due to the laxer lockdown restrictions in rural areas, where individual mobility was less limited.

No significant differences [ $F(2, 386)=2.074$ ;  $p=.127$ ] were found regarding depression but participants who had COVID-19 reported higher levels of depression in 2020 compared to those who didn't contract the disease [ $t(385)=-7.023$ ;  $p<.001$ ], probably due to the symptoms but also to the contradictory information transmitted by all media channels (press, TV, internet, etc.) where rather inaccurate yet insidious information was presented.

#### *Psychosocial changes during the COVID-19 pandemic*

To capture changes in scores at the three assessment time-points (2020-2022) we used repeated measures ANOVA for depression, life events, satisfaction with life, and perceived social support. The Mauchly test returned  $p>.05$  for all measures, so we can assume sphericity according to statistical rules.

Table 3 shows the changes in the study respondents' depression over the course of the pandemic in relation to their statements on whether or not they had COVID-19. The results indicate an increase of depression in participants who had COVID-19 [ $F(2, 385)=34.810$ ;  $p<.001$ ;  $\eta^2=.083$ ] between 2020 and 2022 and the recorded effect indicates an 8.3% dispersion of the results (Figure 1). No interaction of depression with the presence versus absence of COVID-19 was identified. However, we recorded differences between participants [ $F(2, 385)=55.859$ ;  $p<.001$ ;  $\eta^2=.127$ ] with respect to COVID-19, with higher values in participants who had the disease, with depression symptoms ranging from alarm levels to clinical intensity.

The measurement of recent life events in relation to COVID-19 indicates a greater frequency increase in the case of participants who reported infection [ $F(2, 385)=55.948$ ;  $p<.001$ ;  $\eta^2=.127$ ], as well as a significant increase in everyday distress over the three years. In Figure 1, we note a relative association of the distressing events with COVID-19 that is mostly due to movement restrictions and lifestyle changes (*e.g.*, working online, limiting freedom of movement). No significant differences between participants in terms of COVID-19 were identified [ $F(2, 385)=1.627$ ;  $p<.203$ ;  $\eta^2=.004$ ] indicating negative effects that generate distress with both psychological and somatic repercussions.

Table 3. Repeated measures ANOVA for the variables analysed in relation to COVID-19

Variable	COVID-19	M/SD	F	p	Post hoc
Depression 2020	without	1.19/0.79	34,810	.001	2020<2021 2020<2022
	with	1.82/0.77			
Depression 2021	without	1.31/0.83			
	with	1.98/0.86			
Depression 2022	without	1.37/0.82			
	with	2.01/0.84			

Table 3. Repeated measures ANOVA for the variables analysed in relation to COVID-19 - *continued*

Variable	COVID-19	M/SD	F	p	Post hoc
Life events 2020	without	72.73/14.28	55,948	.001	2020<2021 2020<2022
	with	73.67/14.92			
Life events 2021	without	76.87/18.11			
	with	80.99/20.12			
Life events 2022	without	80.07/15.08			
	with	81.23/15.94			
Satisfaction with life 2020	without	24.63/6.68	18,815	.001	2020=2021 2020>2022
	with	26.23/5.30			
Satisfaction with life 2021	without	24.79/5.50			
	with	25.13/5.18			
Satisfaction with life 2022	without	22.81/6.38			
	with	23.91/5.63			
Social support 2020	without	5.33/1.52	135,016	.001	2020>2021 2020>2022
	with	5.37/1.45			
Social support 2021	without	3.85/1.39			
	with	4.20/1.55			
Social support 2022	without	3.80/1.34			
	with	4.13/1.51			

Satisfaction with life (Diener, 1984) can be considered as the combination of feelings and attitudes about life, ranging from positive to negative, at a particular point in a person's existence. On the other hand, life satisfaction is one of the major indicators of well-being. We set out to capture how exactly life satisfaction was affected during the pandemic (in both healthy and COVID-19 infected individuals), given that the population was required to make radical changes in their personal and professional lives. Statistical data indicate significant changes in life satisfaction [ $F(2, 385)=18.815$ ;  $p<.001$ ;  $\eta^2=.047$ ] due to government-imposed limitations and restrictions (Figure 1), with no differences between people who had and who did not have COVID-19 [ $F(2, 385)=3.565$ ;  $p<.06$ ;  $\eta^2=.009$ ].

Some measures imposed during the state of emergency in 2020 and 2021 generated dysfunctional emotional reactions, as well as insularity or dilution of values (*e.g.*, educational in the case of students) affecting the well-being, which justifies the results obtained in the first part of the research.

Perceived social support measured during the pandemic shows [ $F(2, 385)=135.016$ ;  $p<.001$ ;  $\eta^2=.260$ ] a steady decline, indicating rather an alienation from family, friends and significant others. No correlation (Figure 1) between the perception of social support and infection or not with SARS-CoV-2 [ $F(2, 385)=1.730$ ;  $p<.178$ ;  $\eta^2=.004$ ] was identified, indicating that people were alienated regardless of context.

Only a few recent studies have assessed the role of perceived social support during the COVID-19 pandemic. Unfortunately, the role of perceived social support for mental health and related behaviours during the pandemic remains largely overlooked. Therefore, better understanding of the role played

by perceived social support is important for people who have faced radical anti-pandemic measures.

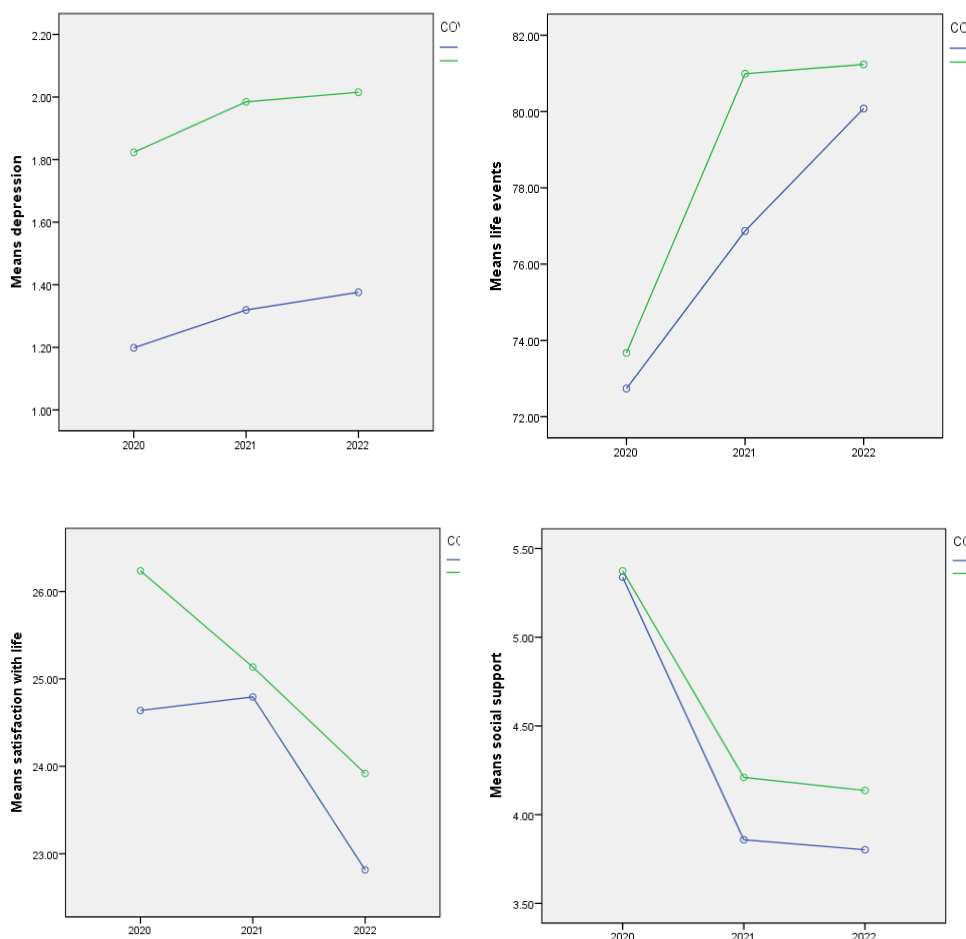


Figure 1. Graphical representation of depression, life events, satisfaction with life, and perception of social support during the pandemic (2020-2022)

However, there are very few studies on the role of negative attributional style in pandemics, such as how it might influence people's behaviour. In our study, the negative attributional style measured in 2020 and 2021 was stable in both healthy participants [ $t(276)=0.768$ ;  $p<.443$ ] and those who had COVID-19 [ $t(109)=1.821$ ;  $p<.071$ ], leading us to infer that it acts as a distal factor in generating depression-specific symptoms.

Consequently, the diathesis-stress model predicts that, even in the absence of negative life events, people who may manifest the depressogenic attributional style will be more likely to develop depressive reactions than people who do not manifest these attributional styles. The relevance of negative attributional style will be examined in the following sections, given that in most

previous studies it was not possible to conduct a longitudinal investigation under exceptional experimental conditions (e.g., COVID-19 pandemic).

*Measurement model*

We used SEM to analyse the causal relationships between the factors deemed to be relevant during the pandemic (Figure 2). In the first phases of the research we showed how the participants' scores changed in relation to the presence or absence of COVID-19, but also in relation to the restrictions the respondents were subjected to, which in some cases were factors that caused massive distress, with psychopathological impacts. The negative attributional style plays the role of a distal factor in sustaining and amplifying psychopathological behaviours, suggesting that it is a critical latent factor in the onset and maintenance of depression.

We tested the relationship between negative attributional style and depression, the mediating role of recent life events, satisfaction with life and the subjective impact of the pandemic. Given that relatively few participants reported SARS-CoV-2 infection (N=110), we decided to build a general explanatory model focusing on the impacts of socio-cognitive factors on depression during the pandemic.

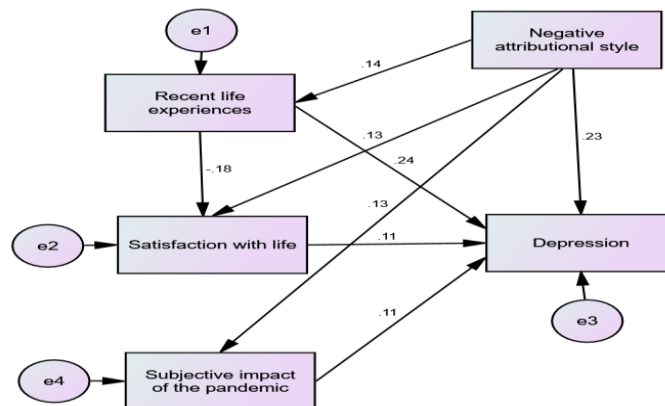


Figure 2. Overall structural model in pandemic context

We tested a set of concurrent models in the initial stage, by analysing whether each coefficient was within the acceptable range. The SEM evaluation indicators  $\chi^2 / df$ , GFI, AGFI, RMR, RMSEA, TLI and CFI were critical for assessing the model's goodness-of-fit (Table 4 and 5). Perception of social support and other constructs assessed in the research, which played an effective

explanatory role before the pandemic were eliminated, and the final model shown in Figure 2 was deemed viable.

In Tables 4 and 5 we present statistical indicators that show the model's high goodness-for-fit. Through the presented coefficients, the final model of the psychosocial mechanism of depression during the pandemic tests and confirms the learned helplessness model.

Table 4. Goodness-of-fit of the whole measurement model

Index	Whole measurement model	Recommended standards
$\chi^2/df$	75.741	>3
Goodness-of-fit index (GFI)	0.912	>.8
Adjusted goodness-of-fit index (AGFI)	0.815	>.8
Root mean square error of approximation (RMSEA)	0.077	<.08
Tucker-Lewis Index (TLI)	0.994	>.9
Comparative Fit Index (CFI)	0.948	>.9

Consistent with the learned helplessness model, we postulated that negative attributional style has a significant effect on depression, but also on the perception of recent life events. The path coefficient (Table 5) of negative attributional style was 0.23 ( $p < .001$ ) for action on depression, 0.14 ( $p < .001$ ) for everyday distressing events, and 0.13 ( $p < .01$ ) for the subjective impact of the pandemic measured in 2020.

The results indicate that recent life experiences have a significant negative impact on depression (0.24;  $p < .001$ ), but also on satisfaction with life, which is also reduced (-0.18;  $p < .001$ ) by the distal actions of the negative attributional style.

Table 5. Results of a t test of path coefficients

			Direct effect	Path coefficient	t value	p
Recent life experiences	<---	Negative attributional style	0.138	0.894	2.728	.006
Subjective impact of the pandemic	<---	Negative attributional style	0.127	0.056	2.508	.01
Satisfaction with life	<---	Recent life experiences	-0.182	-0.052	-3.615	.001
Satisfaction with life	<---	Negative attributional style	0.125	0.235	2.489	.01
Depression	<---	Satisfaction with life	0.110	0.018	2.302	.02
Depression	<---	Subjective impact of the pandemic	0.106	0.071	2.242	.02
Depression	<---	Negative attributional style	0.225	0.067	4.685	.001
Depression	<---	Recent life experiences	0.241	0.011	5.003	.001

Moreover, we postulated that reduced satisfaction with life will have a direct influence on depression (0.11;  $p < .02$ ) as an effect of the distal action of the negative attributional style, and of negative life events, as supported by the model shown in Figure 2.

The subjective impact of the pandemic on depression (0.11;  $p < .02$ ) indicates the reinforcement of a negative perception of the psychosocial plane, with elements that are overtly anxiogenic or involve isolation and alienation.

The 95% confidence level shows that the negative attributional style, recent life experiences, satisfaction with life and subjective perception of the pandemic have a direct effect on depression. On the other hand, an increase in the frequency of recent life experiences will lead to a change in people's overall satisfaction with life and life philosophy, with long-term consequences.

## Discussions

In this study we explored the temporal dynamics of psychosocial variables in the COVID-19 pandemic by specifically tracking mood changes, satisfaction with life, perceived social support, attributional style, and distressing events with potential impact on mental health. We also sought to develop an explanatory model of depression through the lens of the theory of learned helplessness.

In line with previous studies (Swendsen, 1998; Pierce et al., 2020; Wang et al., 2020; Brooks et al., 2020; Marian et al., 2022) we found that daily hassles had a high impact, confirming their major role in mental health impairment. In successive evaluations of daily hassles between 2020-2022 we found no differences between people who experienced illness (COVID-19) and those who were not infected with SARS-Cov-2, which is indicative of a proximal effect on mood. Although longitudinal studies theoretically and empirically support our arguments, other studies show that stressors were not relevant where anti-COVID-19 measures were more lenient (Ahrens et al., 2021) and therefore fewer cases of depression were reported.

Various policy and economic tools, including economic support, could have mitigated the negative effects of the pandemic so that the fear of job loss (Marian et al., 2021; Marian et al., 2022) or financial loss rates would have been much lower, which would presumably have mitigated the impact of the maladaptive attributional style on mood (or even depression).

Individuals who experienced many hassles in the 2020 and 2021 tend to use less direct coping mechanisms when they subsequently face stressors (Szabo & Marian, 2018). Beyond the direct disruptive effect of daily hassles, this could be another way in which their impact on well-being (O'Connor et al., 2021; Zaninotto et al., 2022; Stubbs & Achat, 2022) and depressed mood (Grey et al., 2020; Feng & Yin, 2021) is confirmed.

We did not find an increase in social cohesion and perceived social support in the COVID-19 pandemic, despite other cross-sectional studies claiming the contrary (Grey et al., 2020; Özmete & Pak, 2020; Li et al., 2021),

so this variable was not an adequate predictor of mental health. The tendency towards isolation and loneliness is more obvious in longitudinal studies (Zuo et al., 2021), though most studies argue that social support is important for individual development and mental health. We consider that people with higher levels of perceived social support might be more likely to believe that they would always receive necessary resources to solve problems, thus avoiding a negative attribution style or maladaptive inferences about negative life events, and generating positive expectation for the future (Shaw, 2020; Akova, Kiliç, & Özdemir, 2022).

Currently, studies are available on how COVID-19 restrictions influenced people's satisfaction with life and well-being (Pavot & Diener, 2008; Caycho-Rodríguez et al., 2018; Pop & Marian, 2022). In the early phase of the pandemic (2020), adults on average rated their well-being as high or even higher than in the same period of the previous year. Those who reported lower well-being levels in 2020 were more concerned about the negative health and social-economic consequences of the pandemic (Mertens et al., 2020; Brogårdh et al., 2021). We have no information (yet) on how the public health strategy influenced people's satisfaction with life during the three years of the pandemic. The results of the study show that satisfaction with life decreased between 2020 and 2022, with no noticeable differences between participants who had or had not contracted SARS-Cov-2 in 2020. The restrictions imposed during the first wave of the pandemic generated important changes, by shifting to online learning and teaching (Szabo & Marian, 2017; Vigil et al., 2020; Shpakou et al., 2022) or working online (Wanke & Schwabe, 2020; Marian et al., 2021). Consequently, satisfaction with life decreased slowly in the first year of the pandemic and more significantly in 2022. In line with previous studies (Marian, 2011; Shaw, 2020; Xue et al., 2023) we found that people most often attributed reduced performance to the stress associated with the pandemic.

In the second part of the research we present an explanatory model of depression through the lens of learned helplessness theory, in a pandemic context. Surprisingly, we did not identify any other explanatory models from this theoretical and applied perspective.

The SEM model analysis (Figure 2) shows that the negative attributional style is the distal factor in the occurrence of depression, with impacts even on the interpretation of everyday events and on satisfaction with life. In other words, people with a negative attributional style are acutely aware of life changes and tend to have lower personal well-being or satisfaction with life, with significant dispositional effects. The subjective impact of the pandemic, influenced by the negative attributional style, shows that people were inclined towards those "catastrophic" media reports that confirmed their depressed mood.

## Conclusions

Helplessness was induced during the pandemic by repeated (and failed) attempts to escape from a harmful situation, so that people learned that they had no control over their fate. Conversely to common stressful events, the traumatic COVID-19 pandemic experience is represented by a pervasive and intangible stimulus, determining a persistent crisis in exposed individuals (Aguglia et al., 2021).

In our study, we examine the clinical concept of learned helplessness from a psychosocial angle, to objectively understand how resilience influenced psychological well-being but also a relative shift towards depression during the pandemic. Starting from the conceptualization of learned helplessness (Abramson et al., 1978; Abramson et al., 1989; Marian, 2011; Marian, 2012; Aguglia et al., 2022), we consider that the loss of agency has negative motivational, cognitive and emotional effects.

In line with the diathesis-stress component of learned helplessness theory (Alloy et al., 1988; Abramson et al., 1989), we assumed that the attributional style would interact over time with negative life events in different life contexts, thus explaining frequent mood swings (Swendsen, 1998). Since attributional styles and perceived control types are conceptualised as general dispositional traits, we also assumed that these diatheses would present trans-situational generality. We suggest that depressogenic attributional styles are associated, in various life contexts, with stable and global attributions about the causes of negative events (Peterson et al., 1982; Alloy et al., 1988; Abramson et al., 1989; Swendsen, 1998).

This study aimed to examine self-reported satisfaction with life since the first wave of COVID-19 (2020), as well as perceived changes compared to the same period in the following year (2021). We also looked at whether perceived changes differed by gender, age, marital status, chronic illness, place of residence, etc.

Although we find that the maladaptive attributional style is a predictor of subsequent mood scores, causal relationships in the COVID-19 pandemic should be interpreted with caution. In terms of other methodological issues, the assessment of negative events was based on the participants' own assessment of the negativity (rather than an objective assessment), and the research methodology had no means of verifying the chronology of the self-assessments.

Future studies should explore theoretical aspects that have not yet been investigated from this perspective, but as the components of learned helplessness are clearly not of equal importance to all people in the pandemic context, the determinants of such individual variations will likely prove to be a key factor in understanding the experience of depressed and anxious mood. However, even if future studies will identify relevant factors and causal relationships, it is unlikely that the research methodology will be applicable to natural conditions such as the COVID-19 pandemic.



### *Implications*

The research has a series of theoretical and practical implications. The findings extend current knowledge regarding the relationship between the perceived impact of COVID-19, daily hassles, negative attributional style, satisfaction with life and social support in the general population. We present information on the central role of attributional style and the indirect effects of psychosocial variables in the relationship with depression during the pandemic.

People's perception and interpretation of the radical changes caused in their lives by the pandemic may be useful in helping us better understand dispositional changes and perceived psychological well-being based on latent attributional styles. Another important finding of this study is that the psychological impact of COVID-19 had a negative effect on life satisfaction as a function of participants' mental health status.

In practical terms, the results obtained during the three years of the pandemic support psychotherapeutic interventions aimed at developing optimism and cognitive-emotional skills, which are considered valuable for psychological well-being (Pop & Marian, 2022). In addition, the results provide essential information leading to the development of alternative approaches in pandemic management.

Implementing initiatives that take into account the impact on mental health can result in people having a positive attitude despite the hypothetical problems associated with drastic lifestyle changes (*e.g.*, COVID-19 pandemic). Screening and psychological counselling centres are another approach to helping people in special circumstances.

### *Limitations*

As a longitudinal study, the study has research value, however, some limitations should be considered when interpreting the results. The longitudinal design of the study does not preclude the determination of causality but it was extremely difficult to control respondents in the context of the pandemic. Consequently, the findings herein should be reinforced by studies using similar longitudinal research designs, to help establish causal relationships between the variables studied, which is extremely difficult to do now that the pandemic has been declared over.

Self-report can introduce questionable responses due to social desirability, impression (or self-presentation) management or other strictly personal factors. On the other hand, online sampling and snowball sampling have shortcomings compared to random sampling. Our samples were representative, but the relatively small number of participants (many dropped out over the years) did not allow us to create SEM models for people who had COVID-19 and those who never became infected. Perhaps obtaining an additional dataset would have helped us to capture more accurately the impact of the pandemic on mental health.

*Ethics statement*

This study was carried out in accordance with the recommendations of Code of Ethics of University of Oradea. In accordance with the Declaration of Helsinki, all participants gave written informed consent for their participation in the study.

*Conflicts of interest*

The authors declare no conflict of interest.

*Author contributions*

Authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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