Predicting the role of coping factors on pandemic-related anxiety

Iman Askari[1] · Lara Wenglorz[2] · Frederik Jan Gajewski[3] · Michaela Jänner[1] · Alicia Vetter[1] · Amir Askari[4] ·
Samaneh Askari[5] · Zsuzsánna Balázsy[1] · Silke Bramer-Ugur[1] · Dirk Reinermann[1] · Thorsten Nolting[1] ·
Eva Meisenzahl[1] · Milenko Kujovic[1]

Abstract

The year 2020 saw the emergence of a worldwide pandemic caused by the novel coronavirus COVID-19. Measures against further spread of the virus were taken nearly everywhere in the world. Many countries also imposed social distancing rules and lockdowns on their population. This situation has caused a lot of fear and insecurity, along with reactance and even unrest in some countries. In this study, we measured the psychological concepts of resilience, reactance, positive schemas, social solidarity, and anxiety among psychiatric patients and in how far these factors influence their psychopathological anxiety during the pandemic. The aim was to better understand in what ways these factors influence pandemic anxiety to be able to reduce its negative psychological effects. Findings show a significant effect of positive schemas and social solidarity on the level of pandemic anxiety in a sample of psychiatric patients, but no correlation between resilience or reactance and pandemic anxiety. Based on these insights, the inclusion of positive schemas and social solidarity for therapy should be considered. Looking deeper into the relation between positive schemas and pandemic anxiety could provide insight into the different ways that schemas influence people's anxiety and determine whether some of them are particularly important.

Keywords Resilience · Reactance · Social solidarity · Positive schemas · Pandemic-related anxiety

✉ Iman Askari
drimanaskari@gmail.com

Lara Wenglorz
larawenglorz@googlemail.com

Frederik Jan Gajewski
freddygajewski@web.de

Michaela Jänner
Michaela.Jaenner@lvr.de

Alicia Vetter
Alicia.Vetter@lvr.de

Amir Askari
dramiraskari.iran@gmail.com

Samaneh Askari
s.askari756@gmail.com

Zsuzsánna Balázsy
Zsuzsanna.Balazsy@lvr.de

Silke Bramer-Ugur
Silke.Bramer-Ugur@lvr.de

Dirk Reinermann
Dirk.Reinermann@lwl.org

Thorsten Nolting
Thorsten.Nolting@lvr.de

Eva Meisenzahl
Eva.Meisenzahl@lvr.de

Milenko Kujovic
Milenko.Kujovic@lvr.de

[1] LVR-Klinikum Düsseldorf, Kliniken der Heinrich-Heine Universität, Düsseldorf, Germany

[2] University of Twente, Enschede, Netherlands

[3] University of Duisburg-Essen, Essen, Germany

[4] Iranian Institute of Schema Therapy, Tehran, Iran

[5] Sorayesh and Agahi Institute, Tehran, Iran

Introduction

In 2019, the novel coronavirus COVID-19 was discovered. Due to its high contagiousness, it quickly spread, causing a worldwide pandemic of the disease SARS-CoV-2. Practically all countries in the world were forced to take measures against the virus, often including a temporary shutdown of schools and universities, bars and restaurants, retail shops, as well as the cancellation of concerts, sports matches, etc. People were asked or forced to stay at home, socially isolate themselves from people of other households, and limit contact to others to an absolute minimum (WHO, 2020). The pandemic attacked one of the strongest factors in maintaining mental health – social exchange (BPtK, 2020).

From a societal perspective, the regulations executed under the term "lockdown", including the shutdown of many places for social meetings, lead to economic consequences that keep persisting. On the individual level, all regulations were based on the compliance with strict "social distancing" rules, forcing people to keep distance of at least 1.5 m to others and preventing all physical contact. Strategies were inconsistently discussed and executed in all sixteen federal states of Germany over a period of twelve months, leading to confusion and insecurity in the German population. The situation was slightly relieved over summer, and most shutdowns and restrictions were facilitated (BMG, 2020). However, starting in autumn 2020, a second wave of COVID-19 infections arose almost all over the world. In Germany, the numbers of new infections began to increase drastically again in early October (RKI, 2020), and the German government reacted with a series of new regulations for a lighter lockdown (BMG, 2020). The reapplied measures which were taken to reduce social events and shut down gastronomy and entertainment were not accepted by some parts of the population, who shortly after organized demonstrations without abiding by the rules of keeping distance to others and wearing a mask in crowds (Wieser et al., 2020).

Apart from confusion, insecurity about the future, and fear of infection, many people were already suffering from anxiety due to the social isolation, often accompanied by frustration, boredom, financial loss, stigma, and even post-traumatic stress symptoms (Brooks et al., 2020). The German cohort study NAKO "COVID-19 Pandemic: psychosocial effects on the general population" (NAKO Gesundheitsstudie, 2020) carried out by the Federal Ministry of Education and Research (BMBF) investigated 159,562 subjects over the period of four weeks in May 2020 and found that the psychological strain caused by the pandemic, the long isolation and continuous insecurity about the future led to higher numbers of stress and anxiety symptoms in Germany during the first lockdown until May 2020. Depressive and anxiety symptoms especially increased within participants below the age of 60, particularly in young women. Stress symptoms increased likewise for all genders, particularly in participants within the age group of 30 to 50 (Schwetje, 2020). Similar association of gender and increased anxiety were previously reported elsewhere (Yalçın et al., 2022).

Rationale of this Study

As stated above, the impact of the pandemic and the following lockdowns and limitations heavily influence people's mental wellbeing. Therefore, learning more about the underlying mechanisms, predicting factors (such as solidarity and resilience) and consequences of pandemic anxiety on mental health is prioritized in research to date (Holingue et al., 2020; Hofmeyer & Taylor, 2021; Brooks et al., 2020). Recent studies have investigated the impact of mental wellbeing during the pandemic, among them studies which looked at the levels of mental distress in healthy adults without a mental disorder (Holingue et al., 2020). For example, Hofmeyer and Taylor (2021) investigated anxiety due to the COVID-19 pandemic in a healthcare setting looking at anxiety levels of healthcare workers and thus, suggested optimal behavior of healthcare workers in leading positions to deal with anxiety levels. However, these articles looked at mentally healthy samples. The pandemic's impact on people that already suffer from mental disorder will most likely be even more severe. For instance, Brown et al. (2020) described the pandemic as "a protracted communal stressor that is expected to affect the content, incidence, and severity of psychotic symptoms, both among those who have and those who are at risk of developing a psychotic disorder "(Kopelovich & Turkington, 2021, p.32).

The COVID-19 pandemic has had a noticeable impact on the mental wellbeing of the German population in all areas of the society. Therefore, we must develop preventive measures against social distress in the most diverse areas of society. The purpose of this study is to identify clinical and psychological predictors that influence pandemic anxiety. Four clinical-psychological dimensions were used as predictors, which are briefly explained below: Resilience, Reactance, Positive Internal Schemas and Capacity for Solidarity.

This study aims to identify psychological predictors with an influence on the anxiety caused by the pandemic. This way, we hope to determine and clarify which factors influence pandemic-related anxiety the most, and it will open opportunities to reduce it by dealing with the predicting factors, e. g. in therapy. Each of the four examined factors will be introduced hereinafter.

Reactance

Psychological reactance is often defined as an "unpleasant motivational arousal that emerges when people experience a threat to or loss of their free behaviors "(Steindl et al., 2015, p. 205). Free behavior usually describes the freedom to decide where you want to go, what you want to buy, or simply the freedom to say "No "to something (Steindl et al., 2015). Reactance depends on the significance of the freedom under threat (Steindl et al., 2015). In the current situation, many countries were forced to impose lockdowns and cancellations and to close shops, bars, and restaurants. Usually, reactance leads to actions to restore one's freedom (Rains, 2013). Thus, in many countries (e. g. Germany), the sudden prolonged limitation of personal freedom led to public unrest and demonstrations (Frei et al., 2021), other countries like France even saw violent riots. Therefore, looking at people's tendency to act reactantly might bear valuable information when attempting to understand the psychological impact of the pandemic. High reactance might relate to a high perceived threat of one's freedom because of the pandemic and that would lead to pandemic anxiety.

Social Solidarity

The term social solidarity describes a phenomenon that can often be observed after critical events such as terror attacks or other criminal events, but also after natural hazards like earthquakes (Hawdon & Ryan, 2011). People often come together at the event's location, place down candles or flowers and comfort each other. This solidarity is believed to benefit survivors and victims, as it focuses the attention on the damage that the event inflicted on the whole community, while also showing that the affected people are not alone (Collins, 2004; Hawdon & Ryan, 2011). The pandemic faced society with a challenge that can only be mastered by cohesion within a country, asking people to act solidary and responsibly for the whole country. Restrictions were based on the aim to protect risk groups and spread the number of COVID infections over a longer period (Güner et al., 2020). Thus, people need to rely on other responsibility and the measures asked people to restrict themselves without receiving an immediate benefit from it (Güner et al., 2020). People who are willing to act solidary might develop less fear due to the pandemic.

Resilience

The concept of psychological resilience is described as the ability to recover quickly from the psychological effects of an adverse event (Bonanno et al., 2010). It is as the ability to remain psychologically healthy or stable despite witnessing or experiencing an adverse event (Bonanno, 2004). Being resilient is shown to be negatively correlated with having anxiety (Yildirim, 2019). This correlation can be especially observed in times where negative life events occur. Therefore, one could well argue the massive changes due to the pandemic as a drastic experience in one's life that needs adaptation (Yildirim, 2019). Thus, being resilient may well be an important predictor for developing less fear during the pandemic and have higher levels of psychological well-being, respectively.

Positive Schemas

The concept of positive schemas developed within the approach of Schema Therapy. It assumes that people acquire schemas over the course of their life, most of them in early childhood. These schemas are classified as adaptive (positive) and maladaptive (negative) and mainly serve the purpose of fulfilling an individual's basic needs (Young, 1999). Positive schemas can be understood as a set of beliefs, memories, cognitions and bodily reactions about oneself or the relationship one has with others (Louis et al., 2018). The positive schemas are developed as a reaction to the fulfilment of our core emotional needs. It is based on the idea that each person possesses four core emotional needs (autonomy, connection and acceptance, realistic limits and self-control, spontaneity, and play) that need to be met in order to develop positive schemas. They reflect sets that were build up due to life experiences and the personal interpretations of these. Thus, they highly influence how we behave, think, or feel in certain situations (Videler et al., 2020). As the positive schemas have influenced the way individuals think and how they react, it is assumed that they could also influence the way people react during the pandemic and how they deal with pandemic-related anxiety.

Hypotheses

As explained above, it is expected that each of the predictors influence anxiety in their own way. The following hypotheses were derived:

1. Higher scores in reactance lead to higher pandemic anxiety.
2. Higher scores in social solidarity lead to less pandemic anxiety.
3. Higher scores in resilience lead to less pandemic anxiety.
4. Higher scores in positive schema lead to less pandemic anxiety.
5. There is difference between several age groups with pandemic anxiety and coping factors.
6. There is a difference between male and females with pandemic anxiety and coping factors.

Method

Participants

Originally, 94 subjects participated in the study. Inclusion criteria comprised sufficient knowledge of German, age between 18 and 65 years, participation in inpatient or outpatient clinical treatment, and the ability to give informed consent. In total, seven participants had to be excluded from the sample. Data of 87 subjects (56 female, 31 male) from the inpatient and outpatient population in LVR-Klinikum Düsseldorf (a clinic for psychiatry and psychotherapy) was included in the sample. 85 participants had an educational degree in form of a school graduation, university degree or a training. The participants were diagnosed according to ICD-10 during their treatment in LVR Klinikum Düsseldorf by experienced psychiatrists and psychotherapists (see Tables 1, 2). The recruitment process of this field study started on 9th November 2020 during the second wave of the pandemic and ended on 5th March 2021 during the second lockdown in Germany. All patients who met the inclusion criteria were asked to voluntarily participate in the study by filling out the survey.

Table 1 Sociodemographic characteristics of the sample split by gender

Characteristics	Male (n = 31) (36.05%)	Female (n = 56) (65.12%)	Total (n = 87)
Marital Status			
Single	13 (41.94%)	30 (53.57%)	43 (50%)
Partnered/married	14 (45.16%%)	12 (21.43%)	26 (30.23%)
Divorced/Separated/Widowed	4 (12.90%)	13 (23.21%)	17 (19.77%)
Employment			
Employed	15 (48.39%)	27 (48.21%)	42 (48.84%)
Retired	2 (6.45%)	3 (5.36%)	5 (5.81%)
Student/in training	2 (6.45%)	13 (23.21%)	15 (17.44%)
Unemployed	11 (35.48%)	12 (21.43%)	23 (26.74%)
Highest educational level			
No educational level	1 (3.26%)	1 (1.79%)	2 (2.33%)
School graduation	19 (61.29%)	32 (57.14%)	51 (59.30%)
Vocational training	7 (22.58%)	17 (30.36%)	24 (27.91%)
University degree	4 (12.90%)	5 (8.93%)	9 (10.47%)
Treatment			
Inpatient	15 (48.39%)	29 (51.79%)	44 (51.16%)
Outpatient	1 (3.23%)	1 (1.79%)	2 (2.33%)
Day-care hospital	15 (48.39%)	26 (46.43%)	41 (47.67%)
Diseases			
None	21 (67.74%)	39 (69.64%)	60 (69.77%)
Cardiovascular diseases	3 (9.68%)	3 (5.36%)	6 (6.98%)
Diabetes mellitus	0 (0%)	0 (0%)	0 (0%)
Chronic respiratory diseases	1 (3.23%)	4 (7.14%)	5 (5.81%)
High blood pressure	7 (22.58%)	7 (12.50%)	14 (16.28%)
Housing situation			
Alone	8 (25.81%)	27 (48.21%)	35 (40.70%)
With partner	16 (51.61%)	14 (25%)	30 (34.88%)
With parents	1 (3.23%)	5 (8.93%)	6 (6.98%)
Shared flat	6 (19.35%)	8 (14.29%)	14 (16.28%)
Satisfaction with financial situation			
Very satisfied	0 (0%)	5 (8.93%)	5 (5.81%)
Satisfied	7 (22.58%)	23 (41.07%)	30 (34.88%)
Moderate	16 (51.61%)	9 (16.07%)	25 (29.07%)
Little	1 (3.23%)	11 (19.64%)	12 (13.95%)
Not at all	7 (22.58%)	7 (12.5%)	14 (16.28%)

Numbers reflect the number of participants answering "yes" to the category

Table 2 Diagnoses of patients based on ICD-10

Diagnoses	Mood (affective) disorder total (*n* = 83)	Comorbidity personality disorder (*n* = 12)	Comorbidity anxiety disorder (*n* = 7)	Comorbidity other (*n* = 16)
Moderate episode	11	2	2	1
Severe episode	24	5	2	3
Severe episode with psychotic symptoms	1	1	0	0
Recurrent depressive disorder, current episode moderate	9	2	2	3
Recurrent depressive disorder, current episode severe without psychotic symptoms	26	2	1	7
Recurrent depressive disorder, current episode severe with psychotic symptoms	2	0	0	1
Bipolar affective disorder, current episode severe depression without psychotic symptoms	2	0	0	0
Bipolar affective disorder	2	0	0	1
Other (without depressive episode)	6	0	0	0

Comorbidity other includes panic disorder, schizoaffective disorder, alcohol and substance abuse and mixed and other personality disorders

Patients who were already in treatment at the starting point of the recruitment process were invited to participate in the study, new patients were recruited during the intake of their treatment.

Material

Following a short demographic questionnaire, five questionnaires were used for data collection in this study.

First, the Overall Anxiety Severity and Impairment Scale (OASIS; Norman et al., 2006; Hiller et al., 2018) modified to measure pandemic-related anxiety rated on a 4-point Likert-scale (minimum score 0 und maximum 20) was used. In this case, the participants were asked to report pandemic-related anxiety, for example: "How much did your anxiety interfere with your ability to do the things you needed to do at work, at school, or at home?". The analyses showed good internal consistency and adequate convergent and discriminant validity, as well as sensitivity to change (González-Robles et al., 2018). Exploratory and confirmatory factor analyses supported a unidimensional structure. The five OASIS items displayed strong loadings on the single factor and had a high degree of internal consistency. OASIS scores demonstrated robust correlations with global and disorder-specific measures of anxiety (Campbell-Sills et al., 2009).

Second, the newer version of the Questionnaire of Reactance (Merz, 1983), modified by Hong and Faedda (1996), measures psychological reactance (e.g., "I become angry when my freedom of choice is restricted.", "Advice and recommendations usually induce me to do just the opposite."). The scale is composed of 11 items rated on a 5-point Likert-scale (minimum score 11 und maximum 55)

covering the "generalized" motivation of producing and experiencing psychological reactance. The test-theoretical values meet the requirements demanded of a psychological measure.

Third, social solidarity was measured with the Social Solidarity Scale (Hawdon & Ryan, 2011) which entails six items (e.g., "I am proud to be a member of my community.", "People work together to get things done for this community."), rated on a five-point Likert scale (minimum score 6 und maximum 30). Regarding psychometric properties, it exhibited good construct validity and reliability (Hawdon & Ryan, 2011).

Fourth, the Resilience Scale (Resilienzskala RS-11) (Schumacher et al., 2005) measures resilience in 11 items which are rated on a 7-point Likert-scale (minimum score 11 und maximum 77). Example items include "Usually, I manage everything somehow." or "I have enough energy to do everything I have to do". The newly developed RS-11, conceptualized as an unidimensional scale, is shown to be a reliable and valid instrument that allows an economic assessment of resilience (Schumacher et al., 2005).

Lastly, the German version of the Young Positive Schema Questionnaire (YPSQ, Louis et al., 2018, German validation by Paetsch et al., 2021) measures positive schemas of oneself over the last year. Identical to the original version (Louis et al., 2018), the German YPSQ is a 56-item self-report measure of 14 EAS. Items are rated on a 6-point scale ranging from "Completely untrue of me" to "Describes me perfectly" (minimum score 56 und maximum 336). Regarding psychometric properties, the German YPSQ exhibited satisfying factorial validity, construct and incremental validity, and internal consistency (Paetsch et al., 2021).

Procedure

Ethical consent was given by the Ethical Review Board at the Medical Faculty of Heinrich-Heine-Universität Düsseldorf on July 20th, 2020. After giving their informed consent, the participants completed the questionnaires in single appointments of approximately 30 minutes, taking place at various locations of LVR-Klinikum Düsseldorf.

Data Analysis

Data was analyzed using SPSS 27. Pearson correlations were computed between all four independent variables (positive schemas, reactance, solidarity, and resilience) and the dependent variable (pandemic anxiety). An independent t-test was calculated to investigate whether gender was to be considered a confounding variable. To assess differences between age groups (18–35, 36–52, 53–70) regarding pandemic anxiety, a one-way ANOVA was conducted.

Based on significant correlations between all factors, simple linear regressions were conducted to investigate whether the independent variables (social solidarity, positive schemas) can predict the dependent variable (pandemic anxiety).

To investigate the effects of the interaction of multiple predictors (positive schemas, reactance, solidarity, and resilience) on the outcome variable (pandemic anxiety), a stepwise multiple linear regression was performed.

Due to the exploratory nature of this study, no alpha adjustments were calculated; level of significance was defined as $p < 0.05$.

Results

Results showed five significant correlations between the variables of interest. Pandemic anxiety was significantly negatively correlated with positive schemas ($r = -.22$, $p < .05$; see Table 2), and social solidarity ($r = -.22$, $p < .05$). There was no significant correlation between pandemic anxiety and the other factors of reactance and resilience. Between positive schemas and social solidarity, the correlation was moderate and positive ($r = .31$, $p < .01$), Between positive schemas and resilience, there was a high positive correlation

($r = .54$, $p < .01$). Both positive correlations could give rise to a relationship between positive schemas and solidarity and resilience. Lastly, there was a significant negative correlation between reactance and solidarity ($r = -.25$, $p < .05$).

Results for the independent t-test between female participants ($n = 56$) and male participants ($n = 31$) showed no significant difference in pandemic anxiety, $t(85) = -.755$, $p = .452$. The one-way ANOVA yielded a significant difference on positive schemas between age groups, $F(2/84) = 5.43$, $p < .01$). Tukey post-hoc analysis revealed a significant difference between the youngest age group (18–35 years) and the middle age group (36–52 years) ($p < .05$), as well as between the youngest age group and the oldest age group (53–70 years) ($p < .05$). Between the middle age group and the oldest group, no significant difference in positive schemas was found ($p = .805$). For all other factors, no significant difference was found (see Tables 3, 4).

The stepwise linear regression revealed significant results with positive schemas as a predictor for pandemic anxiety, $F(1/83) = 5.36$, $p < .05$).

A multiple regressions yielded significant results for positive schemas as a predictor for pandemic anxiety $F(1/84) = 4.88$, $p < .05$ and significant results for social solidarity as a predictor for pandemic anxiety $F(1/84) = 4.45$, $p < .05$, see Table 5).

Discussion

The aim of the study was to investigate the influence of predicting factors, such as positive schemas, resilience, reactance and social solidarity on pandemic anxiety in a sample of psychiatric patients.

The hypothesis that higher scores in reactance lead to higher pandemic anxiety had to be rejected. As hypothesized, the study showed a negative relationship between social solidarity and pandemic anxiety. Higher scores in the Positive Schemas questionnaire also lead to less pandemic anxiety. Although resilience was hypothesized to negatively influence pandemic anxiety in people, this hypothesis could not be supported. Interestingly, people with higher positive schemas possessed higher social solidarity and were more resilient, with people in the age from 36 to 70 having

Table 3 Pearson correlations between pandemic anxiety, positive schemas, reactance, social solidarity, and resilience

Factor	M (SD)	1.	2.	3.	4.	5.
1. Pandemic anxiety	7.86 (5.2)	1				
2. Positive schemas	204 (42.54)	−.221*	1			
3. Reactance	29.65 (9.55)	−.103	−.123	1		
4. Social Solidarity	20.20 (6.50)	−.224*	.308**	−.248*	1	
5. Resilience	44.99 (11.83)	−.122	.536**	−.027	−.026	1

*significant on level of 0.05; ** significant on level of 0.01*

Table 4 Statistical analyses

Statistical procedure	Variable/target	Variable/predictor				
Stepwise linear regression	Pandemic anxiety	Positive schemas	$R = .246$	$R^2 = .061$	$F = 5.355$	$df = (1/83)$
			$\beta = -.031$	$\beta = -.246$	$t = -2.314$	**$p = .023$**
Independent t-test Group (Male, Female)		Pandemic anxiety	$t = -.755$	$df = (84)$	$p = .452$	
		Positive Schemas	$t = 1.846$	$df = (85)$	$p = .068$	
		Reactance	$t = .841$	$df = (84)$	$p = .403$	
		Social solidarity	$t = .616$	$df = (85)$	$p = .539$	
		Resilience	$t = -.043$	$df = (85)$	$p = .966$	
One-way ANOVA (Age)		Pandemic anxiety	$F = .085$	$df = (2/83)$	$p = .918$	
		Positive schemas	$F = 5.431$	$df = (2/84)$	**$p = .006$**	
		Reactance	$F = 1.058$	$df = (2/83)$	$p = .352$	
		Social solidarity	$F = 2.014$	$df = (2/84)$	$p = .140$	
		Resilience	$F = 1.016$	$df = (2/84)$	$p = .366$	

Age was divided into three subgroups ranging from 18 to 35, 36–52, and 53–70 years of age

Table 5 Regression

Statistical procedure	Variable/target	Variable/predictor				
Linear regression (enter)	Pandemic fear	Positive schema	$R = .221$	$R2 = .049$	$F = 4.878$	$df = (1/84)$
			$B = -.028$	$Beta = -.221$	$t = -2.073$	**$p = .041$**
Linear regression (enter)	Pandemic fear	Social solidarity	$R = .224$	$R2 = .050$	$F = 4.454$	$df = (1/84)$
			$B = -.181$	$Beta = -.224$	$t = -2.110$	**$p = .038$**

significantly more positive schemas compared to younger patients (18–35). Finally, no gender effect could be found in any of the constructs.

As revealed, positive schemas seem to have an influence on the level and development of the anxiety that is caused by the pandemic. Given that people with more positive schemas showed less pandemic anxiety, it can be assumed that possessing a set of positive schemas can serve as a protective factor against developing anxiety. In accordance with this finding, Keyfitz et al. (2013) argue that a low level of positive schemas can lead to a higher vulnerability to anxiety. This is also in line with O'Byrne et al., 2021 who found that PSQ scores predicted measures of anxiety and depression driven by the pandemic in a sample of university students. Building on the finding of positive schemas having a protective function against anxiety during the pandemic, further notion is given on how to help people build positive schemas. As schemas can be understood as patterns of memories, beliefs, and reactions to oneself or to others leading us to a certain behavior, positive schemas help us develop adaptive behavioral patterns (Paetsch et al., 2021). Therefore, it is evident that possessing a set of positive schemas contributes to having less anxiety. Still, most research and therapy focus on negative, maladaptive schemas. However, negative schemas and positive schemas are considered two separate and distinct constructs, not lying on the same spectrum (Videler

et al., 2020). Thus, the current findings recommend a shift of focus towards the work and establishment of positive schemas during therapy, as a valuable resource activation for people to build up protection against developing anxiety during the time of the pandemic. Insights from the SARS pandemic in 2003 still show negative long-term effects on people's mental health years after the outbreak (Canet-Juric et al., 2020). Thus, it is to expect that the impact of the COVID-19 pandemic will be present over the following years and that people will either seek psychiatric help on their own or be admitted to a clinic. This underlines the importance of promoting positive schemas within clinical treatment to create a buffer against the anxiety and persistent changes coming along with the COVID-19 pandemic.

The second main finding is that people who possess more social solidarity show less pandemic-related anxiety. Possible explanations arise when considering the Social Solidarity Scale. As most items focus on being part of a community, people who feel as a member of society to a greater part may experience the pandemic as a circumstance that is affecting the whole society. This might influence their perception of anxiety that is caused by the pandemic. A possible reason could be that people tend to develop greater fear if they feel that they are alone with a situation. Similar results were obtained by Liekefett and Becker (2021) existential needs, a new created measure of future anxiety and worries, was

related to perceived threat and engagement of self-protecting behavior. Conversely identification, group efficacy and concern for risk groups induced group protecting behavior, emphasizing the importance of social affiliation. Here it is to mention that, although social solidarity and pandemic anxiety were correlated, the regression only revealed positive schemas to be a predictor of pandemic anxiety. However, there was a strong relationship between positive schemas and social solidarity showing that people who possess more positive schemas are also higher in social solidarity. Therefore, future therapy that focuses on positive schemas can indirectly influence social solidarity. Looking more closely at the positive schemas, it turns out that especially the schemas of social belongingness could automatically influence social solidarity which underlines the assumption of social solidarity having an indirect influence on pandemic anxiety. Nevertheless, these are plausible explanations that still require further exploration in future research.

While the results could not demonstrate resilience to be a predictor of pandemic anxiety in a psychiatric sample, a study by Mosheva et al. (2020) found alternative results with resilience being a protective factor against anxiety. Furthermore, the importance of resilience in the context of the impact of the COVID-19 pandemic is underlined by Vinkers et al. (2020). As they considered resilience in general as well as in psychiatric patients, they argue that the controllability of a situation highly influences if, and how, people can handle the effects of crisis situations. Thus, a possible explanation for the findings of the current study could be the fact that loneliness promoted through quarantine regulations, fear of contamination, or health-related threats are even more challenging for people with a psychiatric disorder (Vinkers et al., 2020). Thus, it can be assumed that the impact of the pandemic are occupying people to such a high extent that a moderate level of resilience, as demonstrated in this study, cannot protect against the effects in the population of psychiatric patients. Still, all aforementioned research argues in favor of promoting resilience training within patients, especially respecting the thought that the effects of the pandemic will certainly burden us over the upcoming years.

Limitations

First, the gathered data relied on self-report questionnaires, thus running the risk of being inaccurate or prone to bias (Van de Mortel, 2008; Benítez-Silva et al., 2004). With regard to the study sample of people diagnosed with a mental disorder, the risk of an exaggeration bias is expected to be higher than in a comparable healthy sample. There might have been participants who found themselves in an unfavorable phase or mood at the moment of completing the questionnaires. Furthermore, the questionnaire instruction of measuring anxiety asked only for anxiety that was specifically related to the pandemic. Looking at the participants' condition and current state, it could be assumed that some participants might have had difficulties differentiating between pandemic-related anxiety or anxiety because of their current phase of life. However, data can still be considered reliable because the perception of anxiety relies on subjective feeling.

Future Research

Considering the unexpected outbreak of the pandemic and the massive consequences it has had on the whole world, the COVID-19 pandemic has become an emerging subject in a great number of studies, including several target groups and investigated factors. Thus, placing the findings into the context of previous studies dealing with the COVID-19 or similar pandemics gives rise to the following recommendations. First, several studies underline that effects of the pandemic on people's mental health are considerably heavier for people who already live with a mental health condition (Liu et al., 2020; Hao et al., 2020). Moreover, Nasrallah (2020) discussed if and how to integrate treatment of stress and anxiety caused by the pandemic into already established treatment for mental disorders in psychiatric patients. The authors suggest strategies for stress management to be introduced to the patients along with treatment as usual. For example, mindfulness-based interventions (Yalçın et al., 2022) might improve resilience since mindfulness is related to reduced anxiety/depression scores. Similarly, Behan et al. 2020 suggested that such interventions could decrease pandemic triggered anxiety and distress. However, to date, there is no specific recommendation on how to combine both demands. For future research it is highly recommended to investigate the combination of treating mental health effects caused by the pandemic with usual treatment. Looking at the current findings, a promising opportunity could lie in the investigation of promoting positive schemas, social solidarity, and resilience training.

Conclusion

To conclude, findings show an influence of positive schemas and social solidarity on the level of pandemic anxiety in a sample of psychiatric in- and outpatients. The inclusion of positive schemas and social solidarity for individual and group therapy should be considered to implement these findings. Against the expectations, the study could not detect any influence of people's reactance or resilience on their pandemic anxiety. Looking deeper into the relation between positive schemas and pandemic anxiety could give rise to how different schemas influence people's anxiety and determine whether some of them are particularly important. Deeper knowledge on its relation could be used to

implement units about positive schemas and how to promote them into the treatment of psychiatric in- and outpatients with the aim of lowering pandemic anxiety.

Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

The authors confirm that the present research complies with ethical guidelines.

Declaration of Interest None.

References

Benítez-Silva, H., Buchinsky, M., Man Chan, H., Cheidvasser, S., & Rust, J. (2004). How large is the bias in self-reported disability? *Journal of Applied Econometrics, 19*(6), 649–670.

Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist, 59*, 20–28.

Bonanno, G. A., Brewin, C. R., Kaniasty, K., & La Greca, A. M. (2010). Weighing the costs of disaster: Consequences, risks, and resilience in individuals, families, and communities. *Psychological Science in the Public Interest, 11*, 1–49.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *Lancet, 395*, 912–920.

Brown, E., Gray, R., Monaco, S. L., O'Donoghue, B., Nelson, B., Thompson, A., & McGorry, P. (2020). The potential impact of COVID-19 on psychosis: a rapid review of contemporary epidemic and pandemic research. *Schizophrenia research, 222*, 79–87.

Bundesministerium für Gesundheit (2020). Coronavirus SARS-CoV-2: Chronik der bisherigen Maßnahmen. Retrieved from: https://www.bundesgesundheitsministerium.de/coronavirus/chronik-coronavirus.html. Accessed 10 July 2021.

Bundespsychotherapeutenkammer. (2020). *Corona-Pandemie und psychische Erkrankungen*. BPtK-Hintergrund zur Forschungslage.

Campbell-Sills, L., Norman, S. B., Craske, M. G., Sullivan, G., Lang, A. J., Chavira, D. A., et al. (2009). Validation of a brief measure of anxiety-related severity and impairment: The overall anxiety severity and impairment scale (OASIS). *Journal of Affective Disorders, 112*(1–3), 92–101.

Canet-Juric, L., Andrés, M. L., Del Valle, M., López-Morales, H., Poó, F., Galli, J. I., Yerro, M., & Urquijo, S. (2020). A longitudinal study on the emotional impact cause by the COVID-19 pandemic quarantine on general population. *Frontiers in Psychology, 11*, 2431.

Collins, R. (2004). Rituals of solidarity and security in the wake of terrorist attacks. *Sociological Theory, 22*, 53–87.

Frei, N., Schäfer, R., & Nachtwey, O. (2021). Die Proteste gegen die Corona-Maßnahmen. *Forschungsjournal Soziale Bewegungen, 34*(2), 249–258.

González-Robles, A., Mira, A., Miguel, C., Molinari, G., Díaz-García, A., García-Palacios, A., et al. (2018). A brief online transdiagnostic measure: Psychometric properties of the overall anxiety severity and impairment scale (OASIS) among Spanish patients with emotional disorders. *PLoS ONE, 13*(11), e0206516.

Güner, H. R., Hasanoğlu, İ., & Aktaş, F. (2020). COVID-19: Prevention and control measures in community. *Turkish Journal of Medical Sciences, 50*(SI-1), 571–577.

Hao, F., Tan, W., Jiang, L., Zhang, L., Zhao, X., Zou, Y., Hu, Y., Luo, X., Jiang, X., McIntyre, R. S., Tran, B., Sun, J., Zhang, Z., Ho, R., Ho, C., & Tam, W. (2020). Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry. *Brain, Behavior, and Immunity, 87*, 100–106.

Hawdon, J., & Ryan, J. (2011). Social relations that generate and sustain solidarity after a mass tragedy. *Social Forces, 89*(4), 1363–1384.

Hiller, T. S., Freytag, A., Breitbart, J., Teismann, T., Schöne, E., Blank, W., Schelle, M., Vollmar, H. C., Margraf, J., Gensichen, J., & für die Jena-PARADISE Study Group. (2018). Die Jena Angst-Monitoring-Liste (JAMoL) - ein Instrument zur evidenzbasierten Behandlung von Panikstörung mit oder ohne Agoraphobie in der Hausarztpraxis. *Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen, 131*, 28–37.

Hofmeyer, A., & Taylor, R. (2021). Strategies and resources for nurse leaders to use to lead with empathy and prudence so they understand and address sources of anxiety among nurses practising in the era of COVID-19. *Journal of clinical nursing, 30*(1–2), 298–305.

Holingue, C., Badillo-Goicoechea, E., Riehm, K. E., Veldhuis, C. B., Thrul, J., Johnson, R. M., & Kalb, L. G. (2020). Mental distress during the COVID-19 pandemic among US adults without a pre-existing mental health condition: findings from American trend panel survey. *Preventive medicine, 139*, 106231.

Hong, S. M., & Faedda, S. (1996). Refinement of the Hong psychological reactance scale. *Educational and Psychological Measurement, 56*(1), 173–182.

Keyfitz, L., Lumley, M. N., Henning, K. H., & Dozois, D. J. A. (2013). The role of positive schemas in child psychopathology and resilience. *Cognitive Therapy and Research, 37*(1), 97–108.

Kopelovich, S. L., & Turkington, D. (2021). Remote CBT for psychosis during the COVID-19 pandemic: challenges and opportunities. *Community Mental Health Journal, 57*(1), 30–34.

Liekefett, L., & Becker, J. (2021). Compliance with governmental restrictions during the coronavirus pandemic: A matter of personal self-protection or solidarity with people in risk groups? *British Journal of Social Psychology, 60*(3), 924–946.

Liu, D., Ren, Y., Yan, F., Li, Y., Xu, X., Yu, X., Qu, W., Wang, Z., Tian, B., Yang, F., Yao, Y., Tan, Y., Jiang, R., Tan, S. (2020). Psychological impact and predisposing factors of the coronavirus disease 2019 (COVID-19) pandemic on general public in china. Available at SSRN: https://ssrn.com/abstract=3551415 or https://doi.org/10.2139/ssrn.3551415

Louis, J. P., Wood, A. M., Lockwood, G., Ho, M.-H. R., & Ferguson, E. (2018). Positive clinical psychology and Schema therapy (ST): The development of the Young positive Schema questionnaire (YPSQ) to complement the Young Schema questionnaire 3 short form (YSQ-S3). *Psychological Assessment, 30*(9), 1199–1213.

Merz, J. (1983). Fragebogen zur messung der psychologischen reaktanz [A questionnaire for the measurement of psychological reactance]. *Diagnostica, 29*(1), 75–82.

Mosheva, M., Hertz-Palmor, N., Dorman Ilan, S., Matalon, N., Pessach, I. M., Afek, A., Ziv, A., Kreiss, Y., Gross, R., & Gothelf, D. (2020). Anxiety, pandemic-related stress and resilience among physicians during the COVID-19 pandemic. *Depression and Anxiety, 37*(10), 965–971.

NAKO Gesundheitsstudie (2020). Nako Studie veröffentlicht erste Ergebnisse zur COVID-19 Pandemie: psychosoziale Auswirkungen auf die Bevölkerung. https://nako.de/wp-content/uploads/2020/11/PM_COVID-19-Fragebogen_2020_11_24_final.pdf. Accessed 10 July 2021.

Nasrallah, H. A. (2020). During a viral pandemic, anxiety is endemic: The psychiatric aspects of COVID-19. *Current Psychiatry, 19*(4), e3–e5.

Norman, S. B., Hami Cissell, S., Means-Christensen, A. J., & Stein, M. B. (2006). Development and validation of an overall anxiety severity and impairment scale (OASIS). *Depression and Anxiety, 23*(4), 245–249.

O'Byrne, R., Cherry, K. M., Collaton, J., & Lumley, M. N. (2021). The contribution of positive self-schemas to university students' distress and well-being. *International Journal of Cognitive Therapy, 14*(3), 436–454.

Paetsch, A., Moultrie, J., Kappelmann, N., Fietz, J., Bernstein, D. P., & Kopf-Beck, J. (2021). Psychometric properties of the german version of the young positive schema questionnaire (YPSQ) in the general population and psychiatric patients. *Journal of Personality Assessment*, 1–10.

Rains, S. A. (2013). The nature of psychological reactance revisited: A meta-analytic review. *Human Communication Research, 39*(1), 47–73.

Robert Koch Institut (2020). Täglicher Lagebericht des RKI zur Coronavirus-Krankheit-2019 23.11.2020 – aktualisierter Stand für Deutschland. Retrieved from: https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/Nov_2020/2020-11-23-de.pdf?__blob=publicationFile. Accessed 10 July 2021.

Schumacher, J., Leppert, K., Gunzelmann, T., Strauß, B., & Brähler, E. (2005). Die Resilienzskala – ein Fragebogen zur Erfassung der psychischen Widerstandsfähigkeit als Personenmerkmal. *Zeitschrift für Klinische Psychologie, Psychiatrie und Psychotherapie, 53*(1), 16–39.

Schwetje, S. (2020). Groß angelegte Gesundheitsstudie - Erste Welle setzte Deutschen psychisch zu. *ntv Nachrichtenfernsehen GmbH*. Retrieved from: https://www.n-tv.de/wissen/Erste-Welle-setzte-Deutschen-psychisch-zu-article22122751.html. Accessed 10 July 2021.

Steindl, C., Jonas, E., Sittenthaler, S., Traut-Mattausch, E., & Greenberg, J. (2015). Understanding psychological reactance. *Zeitschrift für Psychologie, 223*(4), 205–214.

Van de Mortel, T. F. (2008). Faking it: Social desirability response bias in self-report research. *The Australian Journal of Advanced Nursing, 25*(4), 40–48.

Videler, A. C., van Royen, R. J., Legra, M. J., & Ouwensm, M. A. (2020). Positive schemas in schema therapy with older adults: Clinical implications and research suggestions. *Behavioural and Cognitive Psychotherapy, 48*(4), 481–491.

Vinkers, C. H., van Amelsvoort, T., Bisson, J. I., Branchi, I., Cryan, J. F., Domschke, K., & van der Wee, N. J. (2020). Stress resilience during the coronavirus pandemic. *European Neuropsychopharmacology, 35*, 12–16.

Wieser, J., Geiler, J., Weiss, J. (2020) Keine Masken, kein Abstand: So chaotisch verlief die Demo gegen Corona-Maßnahmen in Berlin. Retrieved from: https://www.tagesspiegel.de/berlin/keine-masken-kein-abstand-so-chaotisch-verlief-die-demo-gegen-corona-massnahmen-in-berlin/26306090.html. Accessed 10 July 2021.

World Health Organization (2020). Coronavirus disease (COVID-19) advice for the public. Retrieved from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public. Accessed 10 July 2021.

Yalçın, İ., Can, N., Mançe Çalışır, Ö., Yalçın, S., & Çolak, B. (2022). Latent profile analysis of COVID-19 fear, depression, anxiety, stress, mindfulness, and resilience. *Current Psychology, 41*(1), 459–469.

Yildirim, M. (2019). Mediating role of resilience in the relationships between fear of happiness and affect balance, satisfaction with life, and flourishing. *Europe's Journal of Psychology, 15*(2), 183–198.

Young, J. E. (1999). *Cognitive therapy for personality disorders: A schema-focused approach* (rev ed.). Professional Resources Press.