

1. Title Page

The need for accessible mental health interventions for young adults in the COVID-19 pandemic:

A student psychologists' perspective and rapid systematic review

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Key points (98 words)

Question: What mental health interventions for young adults of the general population during the COVID-19 pandemic exist?

Findings: In this rapid systematic review, eight different interventions, of which six were web-based, to address mental health problem among young adults during the pandemic were identified. All interventions were effective in reducing depression and anxiety symptoms, as well as stress.

Meaning: Although there is sparse research on respective interventions, they are promising in counteracting the potential development of mental disorders. Therefore, we propose a concept for an innovative and cost-effective web-based platform to structure and raise awareness for existing measures.

2. Abstract (324 words)

Importance: Although young adults are on average less affected by the physical consequences of COVID-19 infections, showing less severe disease progression and lower mortality risk, they suffer strongly from the mental health impact of the pandemic.

Objective: We, a group of psychology students experiencing these impacts, aim to provide an overview of the existing literature on prevention and intervention efforts to effectively reduce the development of, or suffering from, mental health problems in young adults (18-35) during the COVID-19 pandemic.

Evidence Review: A rapid systematic review was conducted to identify studies focusing on the implementation of mental health interventions for young adults of the general population during the COVID-19 pandemic. Literature was searched with Pubmed and Web of Science on June 17, 2021. The quality of each study was assessed by two reviewers with the Standard Quality Assessment Criteria for Evaluating Primary Research Papers.

Findings: Of N = 76 records initially screened, eight studies met the inclusion criteria. Six applied web-based interventions, of which four were randomized controlled trials. Interventions were based on Cognitive Behavioral Therapy approaches (n = 5), mindfulness practices, logo-autobiography, and synergistic thinking methods. The interventions varied in length from single sessions to multiple sessions over a period of up to 10 weeks. All interventions were effective in reducing depression and anxiety symptoms, as well as stress with small to medium effect sizes and a symptom reduction up to 78.9%. With only three studies being of high quality, the overall quality was low.

Conclusions and Relevance: Research on mental health interventions for young adults in the general population during the pandemic is sparse. However, all interventions resulted in symptoms reductions and thus have been shown to be effective ways of counteracting the potential development of mental disorders during times of uncertainty, with high levels of stress, such as during a pandemic. Therefore, we propose a concept for an innovative and cost-effective web-based platform to structure and raise awareness for existing measures.

Keywords: mental health, intervention, young adults, COVID-19, pandemic, depression, anxiety, prevention

3. Text

Introduction

The outbreak of the severe acute respiratory syndrome coronavirus 2 (hereafter: COVID-19) at the end of 2019 poses one of the greatest challenges our society faced in the 21st century. Nearly 200 million infections with COVID-19 and more than 4 million associated deaths have been recorded worldwide across all populations since January 2020 (<https://covid19.who.int>). The uncertain developments during this pandemic, together with fear of infection, social distancing, restrictions of personal freedom, financial insecurity, and information overload are significant stressors that can dramatically increase the risk of developing mental health problems in the population. Meta-analytic results from 43 studies with more than 70.000 participants during the first wave of the pandemic showed that depression and anxiety symptoms have amplified compared to before the pandemic ¹. During the second wave of the pandemic (starting in September 2020), the proportion of individuals receiving a first-time diagnosis of at least one mental disorder increased to 32.9% as compared to 20% in November 2017. Although young adults have a lower risk for severe disease progression and mortality, they seem to be the ones most affected by the psychological consequences ². Younger age has been consistently identified as a risk factor in respective studies focusing on the general population (e.g., ³⁻⁶).

With increasing severity of the pandemic and its consequences, several cross-sectional and longitudinal studies have been conducted to assess the impact of pandemic-related restrictions and lockdowns on the mental health of young adults. During the first lockdown between April and May 2020, young adults (18-30 years) reported higher psychological distress as compared to older

ones (e.g., in Belgium ⁷; Switzerland ⁸). Besides reporting worse living conditions and fewer social contacts due to the lockdown, young adults also had higher levels of anxiety, depression, and uncertainty regarding their future than older people ⁷. The results of population-based studies conducted in Europe indicate that those aged 18-24 years were at the highest risk for developing symptoms of depression and anxiety during the first lockdown compared to older age groups (e.g., in UK ⁹⁻¹¹; Ireland ¹²; Spain ¹³). Longitudinal results from a large cohort in England between March and August 2020 showed that depression and anxiety symptoms peaked at the onset of the lockdown and decreased over time, while being continuously highest among young adults ¹⁴. Similarly, Australian adults reported having higher levels of depression, anxiety, and stress than older people ¹⁵. Further, 18-24-year-olds in the US showed increased use of substances as coping strategies for emotional and COVID-19 related stress, and increased serious suicidal ideation during the pandemic as compared to older people ¹⁶. The prevalence of internet addiction disorder also increased during the pandemic, particularly among young adults ^{17,18}.

However, it remains unclear why the mental health of young adults is disproportionately more affected by the pandemic compared to older adults. First of all, independent of the risk of contraction, all individuals in the general population must comply with lockdown measures equally to contain the spread of the virus and protect public health, and thus are affected by the same social distancing measures ¹⁹. With loneliness being a risk factor for developing mental health problems in general ²⁰, it is not surprising that increased loneliness due to pandemic restrictions might affect the mental health particularly among 18- to 30-year-olds, as they were already more likely to feel lonely before the pandemic ²¹. Furthermore, concerns about life stability, especially

with regard to the loss of employment, financial insecurity, and the uncertainty regarding a successful completion of education may also have mental health consequences ²², especially for young adults at the beginning of their professional education or career, or for those trying to enter the labor market ²³. During times of financial uncertainty, young adults might become financially dependent again on parents or guardians, which may affect self-esteem and increase general distress ²⁴. Globally, the majority (77%) of young adults with employment worked in informal jobs in the beginning of 2020, which were particularly affected by COVID-19 ¹⁹. With one out of six aged 18 to 29 years having lost their jobs since the beginning of the pandemic and self-reported difficulties ending educational or training programs due to pandemic restrictions ²⁵, negative effects of financial and job insecurities on mental health may have a particularly severe impact ^{26,27}. First studies confirm this impact in the general population (e.g. ^{23,28–30}). Further, missing out on significant life events such as graduation, working experiences abroad, celebrating the beginning of adulthood, and starting university or a first job, as well as changes in daily routines, such as working out or sleeping patterns, are likely to have negative mental health impacts.

During the first year of this pandemic, the mental health of youth and young adults has not been a focus of global and local decision makers. However, with the dramatic increase in mental health problems and the potential long-lasting effects in post-pandemic times, immediate action is required. We, a group of Psychology students in Germany, experiencing the mental health impact of the pandemic, aim to provide a systematic review following the PRISMA guidelines of existing literature on interventions to effectively reduce the development of, or suffering from, mental health problems in young adults during the COVID-19 pandemic. In addition, we provide a

suggestion for making intervention and prevention programs easily available and accessible, and eventually used by young adults. These efforts promise effective and cost-efficient implementation for current and future global mental health crises.

Methods

Search strategies and selection criteria

In this rapid systematic review, we searched two databases, PUBMED and Web of Science, to identify studies conducting mental health interventions during the COVID-19 pandemic specifically for young adults, in the age range of 18-35 years. Studies were included, if they (1) included individuals of the general population aged 18-35 or participants who were classified as students or young adults, (2) implemented a mental health intervention, (3) were conducted during the COVID-19 pandemic, and (4) reported at least one measurable psychological outcome score.

PUBMED was searched using the following keywords: ((covid* OR corona* pandemic) AND (young adults OR students OR youth) AND (mental health OR depression OR anxiety)) AND (intervention [Title] OR prevention [Title]). Forty-three records could be identified. Web of Science was searched using the same keywords: (TS=(covid OR corona pandemic) AND TS=(young adults OR students OR youth) AND TS=(mental health OR depression OR anxiety) AND TI=(intervention OR prevention).

This search yielded a total of 33 records. The literature search was conducted on June, 17th 2021. In total, $N = 76$ publications were included for screening. After removal of 20 duplications, titles and abstracts were screened and further 28 records were excluded, as they included non-eligible cohorts, were reviews or opinion papers. In the full-text screening, another 20 records were removed, as they were not COVID-19-related ($n = 5$) or did not implement an intervention ($n = 15$).

Finally, a total of 8 articles were included in this review. For an overview of the selection process, see **Figure 1**.

- insert Figure 1 here -

Quality assessment of selected studies

The methodological quality of all included studies was evaluated using the checklist and overall rating (*Kmet score*) for quantitative studies from the *Standard Quality Assessment Criteria for Evaluating Primary Research Papers* by Kmet and colleagues³¹. First, all papers were evaluated independently by two authors (RPR, LFFS). Ratings for the study by Yeager and colleagues³² differed considerably. As this paper was the only preprint of studies included in the review, it was excluded before calculating the inter-rater-agreements for the initial assessment. A high inter-rater-agreement (Cohen's Kappa $\kappa = .72$; ³³) for the three categories (fully met, partially met, did not meet criterion) was achieved on the level of the single ratings (see **Table 1**). Across the studies' overall scores (*Quality Score*, see **Table 2**), the agreement was good (Intra-Class-Correlation $ICC3_{single} = .78$, ³⁴). Differing ratings were resolved through discussions by reviewers, with final quality ratings shown in **Table 1**. A third rater (FK) assessed the pre-print by Yeager and colleagues³² and resolved the remaining disagreements. Altogether, the quality of the examined studies ($M_{Kmet\ score} = 0.69$; $SD_{Kmet\ score} = 0.12$) is low, resulting in a mean Kmet score well below the criteria for high-quality studies (Kmet score > 80%, ³⁵). Out of the 8 studies, only three met this criterion, with one reaching the threshold for very high-quality studies (Kmet score > 90%). However, two out of three high-quality studies, including the very high-quality study, were non-randomized trials

where the criteria of randomization and blinding were not applicable. The overall quality ratings are included in **Table 2**, presenting the results of the systematic review

- insert Table 1 here -

Results

The rapid systematic review resulted in a total of eight studies included – for a study summary, see **Table 2**. The minimum mean age reported was 19.8 years³⁶ and the maximum mean age was 31 years³⁹. Two studies included individuals up to 40 and 54 years of age^{36,40}, respectively. Four studies were randomized control trials (RCT^{32,39,40,42}), while the others had no controlled or randomized design. While two studies took place as in-person seminars^{40,41}, all other interventions were online or app-based, and self-administered (i.e., participants decided on when to do the intervention). Five out of eight interventions were Cognitive-Behavioral-Therapy (CBT)-based^{37,38,40,42} or included elements of CBT, such as behavioral activation and cognitive restructuring³⁹. The other interventions used mindfulness practices^{36,38}, logo-autobiography⁴¹ and a synergistic mindset intervention³². The length of the interventions varied between approximately 40 minutes for a single intervention³⁹ and five 1.5-hour sessions⁴². Drop-out rates varied between 13% and 50%. The longest follow-up of all included studies was 4 weeks⁴¹.

In all studies focusing on anxiety, stress and depression, reductions in following the intervention were recorded^{36–38,40–42}. In the study of González-García and colleagues³⁶, mean stress levels decreased from 23.30 to 19.73 (Perceived Stress Scale [PSS-10]) and mean anxiety levels (State-

Trait Anxiety Inventory [STAI]) from 31.62 to 26.79 after the intervention. In participants with high anxiety and depression at baseline, symptom decreased by about 15% post-intervention ³⁷.

Gabrielli and colleagues³⁸ reported with about 10% symptom reductions, a similar pattern of intervention success. Mean depression scores (measured with the Center for Epidemiology Studies Depression Scale [CES-D-10]) decreased from 1.42 to 0.65 at four weeks follow-up measurement ⁴¹. Yeager and colleagues³² showed reductions of 0.97 scale points in anxiety symptoms (Generalized Anxiety Disorder Scale [GAD-7]) post intervention, but only in students with a negative mindset at baseline. Furthermore, in one study, improvements in secondary control as well as perceived negative impact of the COVID-19 crisis on quality of life were identified ³⁹.

The effect sizes of the intervention on reduction of stress, anxiety and depressive symptoms varied between Hedges' $g = 0.5$ ³⁶ and Cohen's $d = 1.0$ to 1.5 ³⁷. According to Cohen's interpretation, small to medium effect were found for the reduction of anxiety regarding COVID-19 as well as one's own health, anxiety sensitivity, and somatosensory amplification after a video-based Cognitive-Behavioral program ⁴⁰. A short single intervention yielded an improvement in secondary control and perceived negative impact of the crisis on quality of life with small to medium effect sizes of $d = 0.25$ and $d = 0.5$, respectively ³⁹. Similarly, another single session intervention improved generalized anxiety symptoms with an effect size of $g = 0.30$ ³².

Clinically relevant symptoms could be reduced by up to 78.9% ³⁷. High rates of perceived usefulness of intervention were reported in two studies, with 87.9% ³⁶ and 88.0% ³⁹, respectively.

Moreover, 80.0% of participants in the experimental group rated online interventions as a good alternative to face-to-face interventions ⁴⁰.

- insert Table 2 here –

Discussion

The COVID-19 pandemic has been identified as a major risk factor for mental health burden among young adults ^{7,43–50}. Especially in young adults, first studies indicate associations between poor mental health during the pandemic and increased substance use ^{48,51–53}, as well as increased use of media, especially social media ^{7,54,55}. Stressors perceived by young adults during this pandemic are multifold ⁵⁰, including uncertainty and fear for loved ones, academic and economic stressors, isolation, lack of social support, misinformation, and lack of physical activity and exercise. Therefore, many researchers and official organizations have called for immediate action and intervention at the beginning and throughout the pandemic (e.g., ^{44,50,56–58}). Given the extensive evidence on the impact of the pandemic on young adult mental health, as well as the persistence of the pandemic and life-restricting measures, millions of young people globally are now at risk of developing mental health problems, experiencing exacerbation of existing problems, and suffering long-term post-pandemic. In order to respond adequately now and to be prepared for future large-scale health crises, it is imperative to have an in-depth understanding of the extent of respective mental health risks and to deal with them successfully by means of interventions.

This rapid systematic review aimed to identify mental health interventions targeted specifically at young adults during the COVID-19 pandemic. To date, there has been very little research on designing and implementing interventions for young adults specifically during the first year of this pandemic. Only eight studies were considered suitable. Interestingly, however, all studies reported an improvement of mental health symptoms, independent of the length of the intervention (ranging from one session to up to 10 sessions), or type of intervention (online, app, self-administered, group-based). These findings confirm the ameliorating effects of online/app-based mental health interventions reported in the literature (e.g., ^{59–62}). Given that the pandemic is still ongoing and the overall follow-up period in the included studies is very short, longitudinal results are needed to investigate whether these positive effects can be sustained over time.

In the last years, there has been a rapid increase in the use of online and digital mental health services and interventions, with promising and, in some cases, long-lasting effects on reductions of mental health problems ⁶³, with therapeutic effects similar to that of face-to-face therapies ⁶⁴. The COVID-19 pandemic, inevitably, led to a massive increase in the use of prescribed online interventions and therapy programs ^{65–67}. Rauschenberg and colleagues ⁶⁸ reviewed 83 studies on the feasibility, use, and benefits of online interventions for mental health concerns in the general population during the pandemic. The interventions demonstrated usability, safety, acceptance, and effectiveness, and were particularly promising when they included aspects of social interaction. Among students with mild or moderate mental health problems, such as depression, anxiety, and stress disorders, online psychological support systems are highly accepted and

feasible ^{69–71}. However, it is unclear whether help-seekers are aware of the existence of such online/digital support systems.

Several countries reported a massive increase in the use of psychological crisis helplines across all ages, with a particular high need among young adults (e.g., ^{72–75}). Hence, with a (increasing) deterioration in people's mental wellbeing during the pandemic, more people are now seeking help through digital services ^{65–67}. However, as shown by one exemplary survey, only about 8% of the adults in the UK use available online services to directly support their mental health during COVID-19 ⁷⁶. Therefore, the existing disparity, accessibility and dissemination of information about respective online services must be improved.

Prevention and Intervention: A synthesizing website

As this article and other studies (e.g., ^{3,4,42}) indicate, there are great concerns about mental health deterioration of young adults during this pandemic. Here, we urge fellow researchers and law makers to address these concerns quickly and efficiently. There is an urgent need for easily accessible mental health interventions to tackle psychological problems and mental health crises, but we also need long-term prevention programs to strengthen resilience and general functioning ^{77,78}. Most of the tools for achieving these goals are already present: online interventions can be an effective and inexpensive alternative or supplement to therapy that is delivered using more traditional modes, overcoming barriers that may prevent people from accessing treatment ⁷⁹. The outcome of internet-delivered treatments is generally, but especially in younger people, very promising ^{59–61}. Therefore, available interventions need to be synthesized and structured in an easy

and user-friendly manner. This would reduce the burden to find the right individualized self-care application in a complex digital environment ⁸⁰. However, synthesis alone will not solve the problem. Psychoeducation and awareness of the availability of such services must be assured ^{81–84}.

We therefore propose the development of a *web-based platform* maintained and integrated in cooperation with city councils, at which young people may find any kind of information related to mental health concerns, but also general mental well-being, which is especially important during large-scale health crises, such as a pandemic. **Figure 2** shows an example of the composition of the website. It should include various subpages on specific topics that have been found to primarily impact young people's well-being and connect them with evidence-based intervention suggestions. For example, mental well-being would include topics like loneliness, coping with anxiety or depression, or sleeping issues ⁸⁵ but also common aspects of maintaining a daily routine or work-life-balance ⁸⁶. Furthermore, the website would include clinical and personal assessments in forms of *voluntary quizzes* and interactive *Chatbots* that may be completed or interacted with upon personal demand or in response to a question of how the person is feeling today. For example, a college student who completes a quiz could find out that their primary challenge concerns stress and anxiety regarding the management of their workload, and could thus, based on their item-responses, be forwarded to the web-based mindfulness intervention. Importantly, however, this website would also contain information on local sport clubs, community centers, arts sessions, opportunities for volunteering and others. Activity in these domains are part of the prevention program as they strengthen resilience, social integration and physical well-being. The

website could present a collection of activities offered in a city, with active links to the provider web pages.

- insert Figure 2 here -

To further amplify the potential positive effect of such an informational website, we suggest cooperating with educational institutions (e.g., schools, universities, youth community centers, general practitioner's practices) to inform young adults about the existence of such a platform and to motivate them to use it for individualized support or intervention. This should also be done preventively, as emotional distress before the pandemic was considered one of the major risk factors of higher emotional distress during COVID-19 ⁸⁷. Additionally, this platform would include links to reliable sources (e.g., RKI-Website Germany, WHO-Website, Center for Disease Control USA) that provide neutral, unbiased information in cases of emergencies, similar to the current pandemic.

Conclusion

The current COVID-19 pandemic still has various repercussions on the daily lives of millions of people. One of the most affected domains in the general population is mental health. Up until now, young adults have not truly been considered in pandemic-related decision-making policies, due to their reduced risk for a severe course of COVID-19. Now, there is ample evidence that young people are among those highest affected by mental health consequences of the COVID-19 pandemic. The negligence of this specific age group needs immediate action. In this rapid

systematic review, we provided an overview of the existing literature on mental health interventions for young adults (18-35) during the COVID-19 pandemic. In general, the research on mental health interventions for young adults is sparse. Interestingly, however, all the interventions that we identified had a positive impact on several aspects of mental health, such as depression, anxiety, and stress. Digital mental health interventions are expected to gain importance in the future, as they seem to be effective and efficient. Currently, however, they lack feasibility due to poor implementation and accessibility for young adults. Thus, we suggest the development of a website which connects psycho-educative information about mental health issues with information about locally available interventions, contacts, resources, and direct links to web- or app-based interventions. We propose the use of optional quizzes on the website to identify the individuals' personal areas of need. In this way, young adults would have the possibility to easily access relevant information about mental health and resources, all combined in one place. Finally, further research is needed to identify optimal strategies of assuring effectiveness, dissemination and accessibility of available mental interventions and prevention programs for the general population. Awareness for the consideration of young adults' needs in future crisis policies needs to be increased.

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5. Tables

Table 1. Standard Quality Assessment Criteria for Evaluating Primary Research Papers

	Primary research studies								
Element (number)	González-García et al. (2021) ³⁶	Bantjes et al. (2021) ³⁷	Gabrielli et al. (2021) ³⁸	Wasil et al. (2021) ³⁹	Shabahang et al. (2021) ⁴⁰	Cho & Jang (2021) ⁴¹	Yeager et al. (2021) ³²	Shabahang (2020) ⁴²	% missing / incomplete
Study question (1)									12.5
Study design (2)									12.5
Sample selection (3)									37.5
Sample descriptions (4)									62.5
Randomization (5)									33.3
Blinding of investigators (6)									100.0
Blinding of participants (7)									100.0
Outcome defined and robust measurement (8)									12.5
Sample size (9)									37.5
Systematic analysis (10)									37.5
Variance estimates (11)									12.5
Confounding									62.5

controlled (12)									
Sufficiently detailed results (13)									12.5
Conclusions supported by results (14)									25.0

Note. All papers were first evaluated independently by two raters (LFFS; RPR) which agreed upon the final ratings after a discussion about the disagreements. The paper of Yeager et al.³² is a pre-print and was assessed after consulting an additional third rater (FK). Blue = fully met criterion, grey = not applicable, light blue = partially met criterion, white = did not meet criterion.

Table 2. Identified studies on mental health interventions for young adults during the COVID-19 pandemic

Authors	Quality Score (in %)	Country	Sample	Design	Intervention	Outcome Measure	Timepoint during pandemic	Finding
González-García, M. et al. (2021) ³⁶	75	Spain	n = 66 first year psychology students; mean age 19.83 (range: 18-25 years), SD = 1.49	Pre-post within-subjects design	<u>Duration:</u> 16 days, total 428.28 min <u>Intervention:</u> online training, mindfulness - and compassion-based intervention <u>Content of intervention:</u> minilectures and home assignments (formal mindfulness and compassion practices), guided meditations, self-reflection exercises	Stress (PSS), anxiety (STAI), and self-compassion, feasibility of the intervention (self-compassion SCS)	April, 30 - May, 15	- Confirmation of intervention feasibility; 87.9% rated the intervention as useful - Intervention significantly decreased stress ($g = 0.5$, $p < .001$) and anxiety ($g = 0.6$, $p < .001$) levels and increased self-compassion ($g = 0.7$, $p < .001$)
Bantjes, J. et al. (2021) ³⁷	91	South Africa	n = 175 students at baseline, n = 125 at follow-up, mean age 22.7 (range: 18-54 years), SD = 4.9	Pre-post design	<u>Duration:</u> 10 weeks, weekly session 60-70 minutes long <u>Intervention:</u> Online-Workshop, cognitive-behavioral therapy program, group setting <u>Content of intervention:</u> 5 themes, each theme spanning 2 workshops: you feel the way you think, planning to succeed, hacks to boost your mood, building mastery, avoiding meltdowns	Anxiety and depression (GAD-7 PHQ-9), satisfaction with treatment	Unknown; During the lockdown in South Africa	Significant decrease of symptom severity (anxiety and depression), stronger decrease for students with moderate to strong symptom severity before intervention ($d = 1-1.5$, $p < .001$) Decline in rates of clinically relevant symptoms (67.7%-78.9%), high satisfaction rates (86.1%) with intervention

Gabrielli, S. et al. (2021) ³⁸	86	Italy	n = 71 students, mean age 20.6 (range: 18-34 years), SD = 2.4	mixed methods proof of concept study, no control group	<u>Duration:</u> 4 weeks, in total 8 session, twice a week, each session 10 min long <u>Intervention:</u> online/ app-based intervention, psychoeducational chatbot (Atena), teaching healthy-coping strategies based on cognitive behavioral therapy, positive psychology, and mindfulness techniques <u>Content of intervention:</u> combination of conversations and audiovisual clips delivered by chatbot	- Anxiety and stress symptoms (GAD-7, PSS) - mindfulness: (FFMQ) - User Engagement: (UES-SF)	mid october - november 2020 (second wave in italy)	Significant decrease of anxiety symptoms in participants with extreme generalized anxiety scores ($t = 0.94$, $p = .009$), decrease of stress symptoms in all participants after intervention ($t = 2.00$, $p = .05$) Significant increase in two mindfulness-subcales (describing and non-judging, $p < .05$), attrition rate of 42%, whereby lower attrition rates could be found in people with higher symptom severity
Wasil, A. R. et al. (2021) ³⁹	75	USA (Pennsylvania)	n = 263 students, mean age 31.04 (no range described), SD = 1.86	RCT, randomization to one of those three modules; pre-post design	<u>Duration:</u> single intervention, individual timing, among completers median time spent on the program was 39.2 min <u>Intervention:</u> digital, self-administered single-session intervention COMET (Cognitive Elements Toolbox) <u>Content of intervention:</u> behavioral activation, cognitive restructuring, gratitude	Depressive symptoms (PHQ-2), anxiety symptoms (GAD-2), acceptability of intervention (AIM - perceived utility of intervention, secondary Control), adapted SCSC, negative impact of COVID-19 crisis, ability to handle COVID-related lifestyle changes	March 30th to April 6th 2020	Significant improvement in secondary control ($d_z = 0.5$, $p < .001$) and perceived negative impact of the COVID-19 crisis on quality of life ($d_z = 0.25$, $p < .001$), 88% rated intervention as helpful
Shabahang, Aruguete, et al. (2021) ⁴⁰	82	Iran	n = 150 college students (n=75)	RCT with waitlist, pre-post	<u>Duration:</u> 3 weeks, 3 times per week, each session 15-20 minutes long	Pretest: CVAQ, SHAI, ASI-3, SSAS; Posttest: CVAQ, SHAI, ASI-3, SSAS + for	March/ April 2020	Significant reduction of COVID-19 anxiety ($F = 139.22$, $p < .001$), health anxiety ($F = 42.97$, $p < .001$), anxiety sensitivity ($F = 40.47$, $p < .001$) and

			intervention; n= 75 waitlist control group) with severe Covid-19 anxiety, mean age 24.7 (range: 18-40 years), SD = 5.4	comparison	<u>Intervention:</u> video-based cognitive-behavioral program <u>Content of intervention:</u> a self-help package containing 9 video clips and a 25-page online booklet based on CBT protocols for health anxiety, combination of cognitive-behavioral, social, educational strategies including e.g. positive appraisal, non-catastrophic beliefs and less-threatening explanations	participants of the intervention group: EPSI, Source Credibility Scale, a satisfaction item, alternative to traditional face-to-face service item		somatosensory amplification ($F= 38.74$, $p<.001$) in intervention group compared to controls with small to medium effect sizes, 80% rated intervention as a beneficial alternative to face-to-face intervention
Cho, S., & Jang, S. J. (2021) ⁴¹	68	South Korea	n = 22 college students, mean age 21.5 (no range described), SD = 2.84	Non-randomized controlled study, pre-post-follow up design	<u>Duration:</u> 6 weeks, once a week, each session 90 minutes long <u>Intervention:</u> logo-autobiography for college students (LAC), group sessions <u>Content of intervention:</u> self-introduction, exploring the unique self, encounters in my story, my crises and choices, self-transcendence in my stories, making a tree of the meaning in life	Perceived stress (PSS) Depression (CES-D-10), Meaning of life (PIL-K)	July–December 2020	Significantly lower perceived stress after intervention (Wald's test = 8.86, $p= .003$) and 4 weeks-follow up (Wald's test = 4.35, $p<.002$) compared to controls Significantly lower depression scores in intervention group compared to controls post intervention (Wald's test = 4.35, $p= .037$), significantly higher meaning of life scores after intervention (Wald's Test = 23.65, $p<.001$) and 4 weeks-follow up (Wald's Test = 13.19, $p<.001$) compared to controls
Yeager et al. (2021) ³²	54	USA	n = 341 undergraduate students (no age described)	RCT	<u>Duration:</u> single session, 30 minutes long <u>Intervention:</u> self-administered online synergistic Mindsets Intervention	General Anxiety Disorder-7 (GAD-7)	Spring 2020 (January: Intervention - mid April: post-assessment)	Reductions in generalized anxiety symptoms among adolescents who reported negative mindsets prior to intervention ($\beta= -0.191$, $p=.014$) with effect size of .30; No effect among adolescents with positive prior mindsets

					<u>Content of intervention:</u> targets growth and stress- can-be-enhancing mindset by overcoming negative patterns of appraisal			
Shabahang, R. (2020) ⁴²	71	Iran	n = 150 college students (age range: 18- 30 years)	RCT with waitlist, pre–post design	<u>Duration:</u> 2 weeks, 5 sessions per week, each 90 minutes long <u>Intervention:</u> online, group- based cognitive-behavioral therapy <u>Content of intervention:</u> reduction of hypervigilance, amplification, false safety- seeking behaviors	Symptoms of anxiety (SHAI), Somatosensory amplification (SSAS), Symptoms of depression (BDI-II)	Beginning of 2020	Significant reductions in health anxiety ($F = 53.44, p < .001$), somatosensory amplification ($F = 12.69, p < .001$), and depression ($F = 56.57, p < .001$) for the experimental group

Note. AIM = Acceptability of Intervention Measure; ASI-3 = Anxiety Sensitivity Index-3; BDI-II = Beck Depression Inventory–Second Edition; CES-D-10 =Center for Epidemiologic Studies Depression Scale; COMET = Common Elements Toolbox; CVAQ = Covid-19 Anxiety Questionnaire; EPSI = Experience of Parasocial Interaction Scale; FFMQ = Five Facet Mindfulness Questionnaire; GAD-2 = Generalized Anxiety Disorder 2-item scale; GAD-7 = Generalized Anxiety Disorder Scale; n = sample size; PHQ-2 = Patient Health Questionnaire-2; PIL-K = Korean version of the Purpose-In-Life questionnaire; PSS-10 =Perceived Stress Scale; RCT = randomized controlled trial; SCS = Self-Compassion Scale; SCSC = Secondary Control Scale for Children; SD = standard deviation; SHAI = Short Health Anxiety Inventory; SSAS = Somatosensory Amplification Scale; STAI = State-Trait Anxiety Inventory; UES-SF = User Engagement Scale-Short Form