Need for structure, loneliness, social media use, and body image as predictors of mental

health symptoms in the context of COVID-19

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Abstract

The coronavirus 2019 (COVID-19) pandemic has disrupted society as a whole and left a significant impact on the lives of many individuals, placing a strain on mental health across the globe. Previous research has found need for structure, loneliness, body image, and social media use, which have been exacerbated during the COVID-19 pandemic, to be separately implicated in many psychological issues. The current study examined how these risk factors (i.e., need for structure, loneliness, perceived body image, and social media exposure) predict mental health outcomes (i.e., social anxiety, depressive, and disordered eating symptoms) all together in the context of the COVID-19 pandemic. A total of 239 participants were included. Results revealed that need for structure, loneliness, and social media exposure were significant predictors of social anxiety. Results also identified loneliness, body image, and social media exposure as significant predictors of disordered eating and depressive symptoms. Last, when examined all together, the overall model for risk factors predicting mental health outcomes was significant, Wilks' Λ = .779, $F(3, 230) = 21.796$, p < .001, partial η^2 = .221. Loneliness and social media exposure were associated with mental health outcomes at high levels. These results emphasize the importance of talking with others, reaching out for support, and staying connected to reduce symptoms and improve mental health during the COVID-19 pandemic. Implications for continuing coping strategies are discussed.

Need for structure, loneliness, social media use, and body image as predictors of mental

health symptoms in the context of COVID-19

The coronavirus disease 2019 (COVID-19) has disrupted society as a whole and left a significant impact on the lives of many individuals, placing a strain on physical and mental health across the globe (Holmes et al., 2020). As the numbers of cases across the United States have risen, guidelines and precautions have been put into place to limit social contact and prevent the spread of the disease. Non-essential businesses have closed, schools have transitioned to an online format, and many people have suffered loss of livelihoods due to the growing pandemic. People have been facing exceptional difficulty compounded by separation from loved ones and disruption of routine, including eating patterns, and recent public health actions have made people feel isolated and lonely, which can be risk factors for depression and anxiety (Adhanom Ghebreyesus, 2020; Center for Disease Control and Prevention [CDC], 2020). No study to date has been able to examine the risk factors for social anxiety, depressive, and disordered eating symptoms simultaneously and how they have been exacerbated in the context of the COVID-19 pandemic. The aim of this study is to add more knowledge to the limited existing literature and examine how risk factors related to the pandemic, such as need for structure, loneliness, perceived body image, and social media exposure, predict social anxiety, depressive, and disordered eating symptoms.

Social Anxiety

Social anxiety, or social phobia, is described as an excessive or maladaptive reaction to social situations, when a person is exposed to unfamiliar people, or to situations that could make them feel embarrassed or humiliated (National Institute of Mental Health [NIMH], 2018). Individuals with social anxiety tend to worry that their behaviors will be negatively evaluated by

others, leading them to avoid social situations. COVID-19 has eliminated many face-to-face

interactions in an effort to protect physical health. As norms have changed and social

expectations are unclear, such as how to greet others when social distancing is enforced,

individuals may experience symptoms related to social anxiety. This study examines the

relationship between risk factors related to the pandemic and social anxiety symptoms.

Depression

The COVID-19 pandemic has introduced preventative measures to reduce the spread of

the disease, including increased social isolation and physical distancing. Social relationships and

connections are a vital part of the human experience. When they are lacking, research has shown

that social isolation and loneliness have been associated with depressive symptoms (Ge et al.,

2017). Major depressive disorder (MDD) is a common mood disorder that affects how a person

feels, thinks, and manages daily tasks or activities (NIMH, 2018). Symptoms of depression

include depressed mood; lack of interest or pleasure (anhedonia); significant weight loss or

weight gain, or increase or decrease in appetite; insomnia or hypersomnia; psychomotor

agitation; fatigue or loss of energy; feelings of worthlessness or inappropriate guilt; diminished

ability to think or concentrate; and recurrent thoughts of death or suicidal ideation (American

Psychiatric Association [APA], 2013). If feelings persist for more than two weeks for most of the

day, nearly every day, an individual may meet criteria for a major depressive episode. This study

examines the relationship between risk factors of the pandemic and depressive symptoms.

Disordered Eating

Disordered eating is a descriptive phrase that refers to a range of irregular or maladaptive

eating behaviors that do not yet meet criteria for an eating disorder (APA, 2013). However, a

person with disordered eating behaviors is still at risk for significant physical, mental, and

emotional stress. Some eating disorder behaviors include frequent dieting, anxiety towards

specific foods, or meal skipping; preoccupation with weight, food, and body image; feelings of

guilt or shame associated with eating; and chronic weight fluctuations (APA, 2013; Yu & Tan,

2016). Ramalho and colleagues (2021) found that the COVID-19 pandemic was associated with

disordered eating and psychological distress mediated the relationship. Increased time spent

using social media, loneliness, body dissatisfaction, and negative affect (mostly depressive

symptoms), which have been exacerbated during the COVID-19 pandemic, have been found as

potential risk factors for disordered eating (Abebe et al., 2014; Fernández-Aranda, et al., 2020).

This study aims to examine disordered eating as a mental health outcome with need for structure,

loneliness, perceived body image, and social media exposure as risk factors in the context of the

pandemic.

Need for Structure

Having a regular routine may help establish a certain degree of structure in an

individual's life. Need for structure is a way to simplify the world into a manageable form, which

may include establishing routines, reducing the amount of information needed to attend to, and

utilizing a social script when interacting with others (Neuberg & Newsom, 1993). The COVID-

19 pandemic has placed restrictions in daily activities and limited access to places that may assist

with emotional regulation (e.g., participating in sports, visiting a therapist) for individuals

(Fernández-Aranda et al., 2020). To prevent the spread of the disease, the public has been asked

to stay indoors, and with constraints placed on regular activity, disruption of routine and

structure may lead to heightened body image concern as well as disrupted eating patterns

(Fernández-Aranda et al., 2020; Rodgers et al., 2020). Studies have also found a significant

relationship between personal need for structure and anxiety (Neuberg & Newsom, 1993;

Prokopcáková, 2015). As the COVD-19 pandemic has disrupted regular routine for many individuals, this study examines lack of structure as a risk factor for social anxiety, depressive, and disordered eating symptoms.

Loneliness

Another risk factor that has been prominent during the COVID-19 pandemic is loneliness. Cacioppo et al. (2015) describes the feeling of loneliness as a discrepancy between the social relations an individual prefers and actual social experience. Loneliness is a subjective feeling and may be unique to each individual. Amidst the pandemic, physical restrictions have been put into place, including social distancing, quarantine, and isolation in order to prevent the spread of the disease (CDC, 2020). Loneliness is more likely in individuals experiencing social isolation or separation from their friends or family, which has increased during the COVID-19 pandemic (Fernández-Aranda et al., 2020). Several longitudinal studies have examined loneliness as a risk factor for depressive symptoms, social anxiety symptoms, and disordered eating behaviors (Hwang et al., 2020 Lim et al., 2016; Pritchard & Yalch, 2009). Hwang and colleagues (2020) found that although social distancing guidelines are necessary in order to prevent the spread of the disease, it may lead to loneliness and social isolation, which produce mental health repercussions. This study examines loneliness related to the pandemic as a risk factor for social anxiety, depressive, and disordered eating symptoms.

Body Image

Another risk factor that may be associated with mental health outcomes experienced during the pandemic is changes in body image. Body image is a multifaceted construct that refers to the attitudes towards one's body and actions to obtain what one perceives as ideal, which is usually conceptualized as the evaluation of attractiveness and feelings associated with body

shape and size (Grogan, 2006; Levitt & Ducaine, 2017). Sociocultural factors, such as media exposure, family or peer influence, and sports participation, and gender, can impact body concerns (Groetz, Levine & Murnen, 2002; Grogan, 2006; Rodgers, et al., 2020). Messages about body image are received almost daily for all genders. Body dissatisfaction is a known predictor of disordered eating, depressive, and social anxiety symptoms, and is associated with a number of other adverse mental health consequences (Abebe et al., 2014; Aderka et al., 2013; Ramalho et al., 2021).

This study aims to examine perceived body image, or body apperception, in the context of the pandemic and its relationship with social anxiety, depressive, and disordered eating symptoms. Negative body image is known to increase an individual's risk of developing behaviors associated with eating disorders, which are often comorbid with anxiety and depressive symptoms (Hrabosky et al., 2009; Manaf, Saravanan, & Zuhrah, 2016). In addition, Aderka and colleagues (2013) found that symptoms of social anxiety disorder are significantly associated with disturbances in body image and attitudes towards one's appearance. Individuals who self-report more positive body attitudes may experience greater subjective happiness (Swami et al., 2015); however, negative perceptions, feelings, and thoughts of one's body are linked to disordered eating behaviors, including weight-related concerns, dieting, and food restraints (Bucchianeri et al., 2013; Ramalho et al., 2021; Swami et al., 2015). No previous studies have examined perceived body image as a predictor for social anxiety, depressive, and disordered eating symptoms all together along with other risk factors.

Social Media Exposure

With increased social isolation and limited face-to-face interaction during the COVID-19 pandemic, media exposure has increased, which may pose as a risk factor for mental health

outcomes. Many daily activities have been modified to fit an online format, in order to follow social distancing guidelines. Numerous studies have assessed the social comparison theory and have shown evidence to support that media exposure could potentially impact mental health and body image perception (Sherman et al., 2017). Researchers believe that the social comparison theory occurs in the social context when an individual's self-understanding stems from standards observed between others (Forsyth, 2000). Sherman and colleagues (2017) found that the use of social media to determine appropriate or acceptable social behavior provides quantifiable measures of peer endorsements, which appeals to social media users. These sites include Instagram, Snapchat, TikTok, and Twitter, and by feeding into various media outlets, body image can be adversely affected.

If perceived social media standards are not met, perception of body image can be significantly diminished and result in potentially harmful behaviors to meet a perceived perfect-ideal (Dakanalis et al., 2014). Dakanalis et al. (2014) suggested that exposure to media-idealized images over a course of time was increasingly linked to individual well-being. Media exposure during the COVID-19 pandemic and body dissatisfaction could predict disordered eating patterns and concerns related to weight outcomes, including dieting, weight gain, and dietary restraints (Bucchianeri et al., 2013; Fernández-Aranda et al., 2020).

Body image ideals are often influenced by those on social media and misrepresented. In comparison to the actual population, the way in which bodies appear in media are often unrealistic and unattainable, and increased social media use may correlate with body dissatisfaction (Van der Meulen, 2017). Although social media is often viewed as a positive way to stay connected and interact with others, increased social media use is associated with negative

psychological well-being (Twenge, 2019). This study further examines the relationship between social media exposure and social anxiety, depressive, and disordered eating symptoms.

Rationale and Hypotheses

With little previous research done in the context of the novel COVID-19 pandemic, the present study aims to examine the relationship among need for structure, loneliness, perceived body image, and social media exposure (as predictors) and social anxiety symptoms, depressive symptoms, and disordered eating symptoms (as outcomes; see Figure 1). The global pandemic has highlighted the importance of several aspects of life that may have been overlooked prior to COVID-19, including the importance of social connection, support, and structure, which have all been disrupted during COVID-19. Although the outcomes of the proposed risk factors have been examined in previous studies separately, no other study to date has examined the predictors and outcomes all together in the context of the pandemic. The results of this study have important implications about understanding the relationship between risk factors experienced during the COVID-19 pandemic and social anxiety, depressive, and disordered eating symptoms. Based on the existing research, this study's hypotheses were:

1. Need for structure, loneliness, perceived body image, and media exposure predict social anxiety symptoms.

2. Need for structure, loneliness, perceived body image, and media exposure predict depressive symptoms.

3. Need for structure, loneliness, perceived body image, and media exposure predict disordered eating symptoms.

4. Need for structure, loneliness, perceived body image, and media exposure predict disordered eating symptoms, social anxiety symptoms, and depressive symptoms.

Methods

Participants

There was a total of 239 participants in this study, of which 19.7% ($n = 47$) were male, 79.1% ($n = 189$) were female, and 1.3% ($n = 3$) were non-binary or non-conforming. In this sample, 6.7% of individuals identified as Black or African American ($n = 16$), 10% identified as Hispanic ($n = 24$), 5.9% identified as Asian ($n = 14$), 67.8% identified as White or Caucasian ($n = 162$), 9.2% identified as Multiracial/Biracial ($n = 22$), and 0.4% identified as other ($n = 1$). The majority (83.3%, $n = 199$) of participants were current college students and 16.7% were not ($n = 40$). Of those who were college students, 98.5% were students at Stockton University ($n = 195$). The average age of participants in this sample was $M = 24.74$ ($SD = 11.14$). Refer to Table 1 for complete demographic information.

Measures

Demographic Questionnaire. Demographic questions included information about the participants' age, gender, race/ethnicity, education, place of residence, and mental health history.

COVID-19 Pandemic Experience. Participants were asked a series of questions regarding their COVID-19 pandemic experience. Examples include: "In the past 6 months, how much has the COVID-19 pandemic affected your: Daily Routine; Loneliness; Body Image; Social Media Exposure (Facebook, Twitter, Instagram, etc.)?"; and "Related to the COVID-19 pandemic, in the past 6 months, have you experienced any of the following: Feelings of anxiety; Feelings of depression; Changes in eating patterns (i.e., frequent dieting; feelings of guilt associated with eating; preoccupation with weight, food or body image)". Questions were intended to prime participants to think in the context of the COVID-19 pandemic.

Personal Need for Structure Scale (PNS). The Personal Need for Structure Scale

(Thompson et al., 2001) is a 12-point instrument used to assess an individual's preference for

known structure and familiar situations with three sub-scales: preference for orderliness,

discomfort with unpredictability, and disdain for ambiguity. Responses are recorded on a 6-point

Likert scale (1 = Strongly Disagree to 6 = Strongly Agree). Statements on the PNS Scale include

"It upsets me to go into a situation without knowing what I can expect from it", "I like being

spontaneous" (reverse-coded), and "I hate to change my plans at the last minute". Four of the

scale items were reverse-coded. Higher scores indicate higher need for structure and lower

flexibility and adaptability when it comes to unstable situations (Svecova & Pavlovicova, 2016).

The PNS Scale demonstrated good internal consistency in the original study (Cronbach's α =

0.84; Thompson et al., 2001). The scale in this study demonstrated acceptable internal

consistency (Cronbach's α = .74).

UCLA Loneliness Scale (ULS-8). The UCLA Loneliness Scale (Hays & DiMatteo,

1980) is designed to measure an individual's feelings of loneliness and social isolation. The

eight-item measure consists of responses on a four-point Likert scale, with each item rated as

either "I often feel this way", "I sometimes feel this way", "I rarely feel this way", and "I never

feel this way". The ULS-8 includes two reverse-scored, positively worded items (Item 3: "I am

an outgoing person", and Item 6: "I can find companionship when I want it"). Higher scores

indicate higher degrees of loneliness. Total scores range from 8 to 32. The ULS-8 demonstrated

good internal consistency previously (Cronbach's α = 0.82; Xu et al., 2018) and in this study

(Cronbach's α = .83).

Measure of Body Apperception Scale (MBA). Originally developed for breast cancer

patients, the Measure of Body Apperception Scale is an eight-item instrument that measures self-

reported appreciation of the body and how perceived body image relates to self-worth with two scale factors — reliance on physical appearance and reliance on body integrity (Carver, 2013; Carver et al.,1998). Examples of statements on the MBA scale include "It's important to me to look my best all the time" (physical appearance), "The idea of having surgery bothers me because it means doing damage to my body" (body integrity), and "I feel good about myself only if I know I look good to other people" (physical appearance). Participants respond on a four-point Likert scale how much they agree or disagree with each statement. The highest possible score is 32. Higher scores indicate lower body image, or negative perception of oneself. The MBA scale demonstrated acceptable internal consistency (Cronbach's α = 0.77; Jean-Pierre et al., 2013) and in this study (Cronbach's α = .77).

Social Networking Time Use Scale (SONTUS). Although it is a relatively new scale, the Social Networking Time Use Scale (Olufadi, 2016) is a standardized instrument that is used to measure the amount of time spent on social networking sites. An abbreviated version of the SONTUS that is relevant to the COVID-19 climate was used. The adapted questionnaire consisted of 25-items on a 6-point Likert scale of 1 (not applicable to me during the past week) to 6 (I used it most days this week). Participants were aked to indicate how often they use social networking sites like Facebook, Instagram, Twitter, Snapchat, TikTok, etc., during the past week in a set of situations and places. Examples of statements on the adapted SONTUS included "When you are at home sitting idly"; "When you are watching TV, news, sports, etc."; "When you are in bed about to sleep"; "When you are receiving a class lecture"; "When you need to reduce your emotional stress"; and "When you are online doing school or job-related work". Participants answered questions related to the following: Relaxation and Free Periods, Academic-Related Periods, Stress-Related Periods, and Motives for Use. Lower scores indicated

higher social media exposure. The original SONTUS demonstrated excellent internal consistency (Cronbach's α = 0.92; Olufadi, 2016). The abbreviated version in this study also showed excellent internal consistency (Cronbach's α = .95).

Eating Attitudes Test (EAT-26). The Eating Attitudes Test is a 26-item screening measure used to determine if an individual is experiencing abnormal eating behaviors (Garner et al., 1982). EAT-26 is not designed as a diagnostic tool for eating disorders. Responses are on a six-point Likert scale about symptoms occurring within the last six months (Always = 3, Usually = 2, Often = 1, Sometimes = 0, Rarely = 0, Never = 0). One of the items is reverse coded. Higher scores (above 20) indicate disordered eating behaviors (Banasiak et al., 2001). Sample items on the EAT-26 include "[I] Am terrified about being overweight", "[I] Feel extremely guilty after eating", and "[I am] Aware of the calorie content of foods that I eat". The EAT-26 demonstrated good internal consistency before (Cronbach's α = 0.87; Banasiak et al., 2001) and in this study (Cronbach's α = .83).

Social Phobia Inventory (SPIN). The Social Phobia Inventory (Connor et al., 2000) is a 17-item, self-reported measure used to evaluate an individual's fear, avoidance, and physiological discomfort in social situations (i.e., social events, being criticized, talking to strangers). Responses are on a five-point Likert scale from 0 (Not at all) to 4 (Extremely) and are about symptoms occurring in the last week. The assessment screens for social phobia and includes statements such as "I avoid talking to people I don't know" and "I am afraid of doing things when people might be watching". The highest possible score is 68, and a cut-off value of 19 may be used to differentiate participants with and without social phobia. Higher scores indicate more symptoms of social anxiety. Social anxiety symptoms are reflected through

different levels of scores for the SPIN, which demonstrated excellent internal consistency in the original study (Cronbach's α = 0.94; Connor et al., 2000) and in this study (Cronbach's α = .93).

Patient Health Questionnaire (PHQ-9). The Patient Health Questionnaire is a nine-item depression module used to measure and screen for depressive symptoms (Kroenke et al., 2001). Participants are asked about depressive symptoms experienced within the last two weeks, and responses are on a four-point Likert scale (Not at all = 0, Several days = 1, More than half the days = 2, Nearly every day = 3). Examples of statements on the PHQ-9 are: "Little interest or pleasure in doing things" and "Feeling tired or having little energy". Scores can range from 0 to 27. Scores below 10 indicate no depressive symptoms, and higher scores suggest more severe depressive symptoms, which may require further evaluation for diagnosis. The PHQ-9 demonstrated excellent internal consistency in the original study (Cronbach's α = 0.89; Kroenke et al., 2001) and in this study (Cronbach's α = .91).

Procedure

Participants were recruited through the Stockton University SONA system, and granted class credit as an incentive to participate. They signed a consent form and completed the survey through Qualtrics. This study was approved by the University's Institutional Review Board.

An additional recruitment method focused on recruiting individuals through social media venues, including Facebook, Twitter, and Instagram and inviting individuals via email to participate in the study. Anyone over the age of eighteen was eligible to participate. Participants who completed the study outside of SONA were invited to be entered in a raffle to win one of 30 $10.00 Amazon gift cards. The two incentives could not be combined. The participants were able to enter the raffle on a page separate from their completed responses. Their identity was not connected to their responses.

Data Analysis Plan

Descriptive statistics and correlations among all predictor (need for structure, loneliness, body image, and media exposure) and outcome variables (social anxiety, depressive, and disordered eating symptoms) were examined.

The first hypothesis was tested with a multiple regression analysis. Need for structure (PNS), loneliness (ULS-8), perceived body image (MBA), and media exposure (SONTUS) were entered as independent variables. Social anxiety symptoms (SPIN) was entered as the dependent variable.

The second hypothesis was tested with a multiple regression analysis. Need for structure (PNS), loneliness (ULS-8), perceived body image (MBA), and media exposure (SONTUS) were entered as independent variables. Depressive symptoms (PHQ-9) was entered as the dependent variable.

The third hypothesis was tested with a multiple regression analysis. Need for structure (PNS), loneliness (ULS-8), perceived body image (MBA), and media exposure (SONTUS) were entered as independent variables. Disordered eating symptoms (EAT-26) was entered as the dependent variable.

The fourth hypothesis was tested with a multivariate multiple regression. Need for structure (PNS), loneliness (ULS-8), perceived body image (MBA), and media exposure (SONTUS) were entered as covariates. Social anxiety (SPIN), depressive (PHQ-9), and disordered eating symptoms (EAT-26) were entered as the three dependent variables.

Results

All analyses were conducted using IBM SPSS Statistics 26. Means, standard deviations, and Pearson r correlations for each of the predictors (need for structure, loneliness, perceived

body image, and media exposure) and outcomes (social anxiety, depressive, and disordered

eating) appear in Table 3. All of the risk factors had statistically significant correlations with the

outcomes.

Hypothesis 1

A multiple regression analysis showed that need for structure (β = .239, p < .001),

loneliness (β = -.416, p < .001), and social media exposure (β = -.134, p = .017) were significant

predictors for social anxiety symptoms. Body image was not a significant predictor (β = .063, p =

.275). Overall, the model accounted for 37.4% of the variance in social anxiety symptoms, R^2 =

.374, $F(4,232)$ = 34.725, p < .001.

Hypothesis 2

A multiple regression analysis showed that loneliness (β = -.485, p < .001), body image

(β = .123, p = .033), and social media exposure (β = -.154, p = .006) were significant predictors

for depressive symptoms. Need for structure was not a significant predictor (β = .039, p = .488).

Overall, the model accounted for 37.6% of the variance in depressive symptoms, R^2 = .376,

$F(4,233)$ = 35.160, p < .001.

Hypothesis 3

A multiple regression analysis also showed that loneliness (β = -.138, p = .033), body

image (β = .253, p < .001), and social media exposure (β = -.161, p = .012) were significant

predictors for disordered eating symptoms. Need for structure was not a significant predictor (β =

.07, p = .278). Overall, the model accounted for 18.7% of the variance in disordered eating

symptoms, R^2 = .187, $F(4,233)$ = 13.440, p < .001.

Hypothesis 4

A multivariate multiple regression using the Multivariate General Linear Model function in SPSS was conducted, and the overall model for risk factors predicting mental health outcomes was significant, Wilks' $\Lambda = .779$, $F(3, 230) = 21.796$, p $< .001$, partial $\eta^2 = .221$. Univariate analyses showed that need for structure ($F(4, 232) = 54.21$, $p < .001$, partial $\eta^2 = .07$, $\beta = .45$, $t(4, 232) = 4.25$, $p < .001$), loneliness ($F(4, 232) = 18.02$, $p < .001$, partial $\eta^2 = .19$, $\beta = -1.23$, $t(4, 232) = -7.36$, $p < .001$), and social media exposure ($F(4, 232) = 5.73$, $p < .001$, partial $\eta^2 = .02$, $\beta = -.09$, $t(4, 232) = -2.3$, $p < .001$) were statistically significant predictors of social anxiety symptoms. Loneliness ($F(4, 232) = 74.89$, $p < .001$, partial $\eta^2 = .24$, $\beta = .45$, $t(4, 232) = -8.65$, $p < .001$), body image ($F(4, 232) = 4.6$, $p < .001$, partial $\eta^2 = .02$, $\beta = 1.2$, $t(4, 232) = 2.15$, $p < .001$), and social media exposure ($F(4, 232) = 4.6$, $p < .001$, partial $\eta^2 = .03$, $\beta = -.05$, $t(4, 232) = -2.71$, $p < .001$) were statistically significant predictors of depressive symptoms. Furthermore, loneliness ($F(4, 232) = 4.56$, $p < .001$, partial $\eta^2 = .02$, $\beta = -.28$, $t(4, 232) = -2.14$, $p < .001$), body image ($F(4, 232) = 14.91$, $p < .001$, partial $\eta^2 = .06$, $\beta = .37$, $t(4, 232) = 3.86$, $p < .001$), and social media exposure ($F(4, 232) = 6.47$, $p < .001$, partial $\eta^2 = .03$, $\beta = -.07$, $t(4, 232) = -2.54$, $p < .001$) were also statistically significant predictors of disordered eating symptoms.

Discussion

The global pandemic has highlighted the importance of several aspects of life that may have been disrupted during COVID-19. The present study examined how risk factors related to the COVID-19 pandemic (i.e., need for structure, loneliness, perceived body image, and social media exposure) predict mental health outcomes (i.e., social anxiety, depressive, and disordered eating symptoms). The hypotheses were largely supported. However, need for structure did not significantly predict depressive or disordered eating symptoms, and body image did not significantly predict social anxiety symptoms in the multiple regression models. When examined

all together, the results indicated an association between risk factors experienced during the COVID-19 pandemic and mental health outcomes.

This study indicated that individuals who reported higher need for structure, greater perceived loneliness, and increased social media exposure, also reported higher social anxiety symptoms. These findings are consistent with previous research (Aderka et al., 2013; Lim et al., 2016; Prokopčáková, 2015). However, body image was not found to be a risk factor. Despite having a moderate correlation with social anxiety symptoms on its own ($r = .29$, $p < .01$), body image did not predict social anxiety symptoms when need for structure, loneliness, and social media exposure were included. This finding was inconsistent with previous research that found reduced satisfaction of appearance and reduced feelings of attractiveness significantly associated with social anxiety symptoms (Aderka et al., 2013). The insignificance may be explained by the lack of social interaction experienced during the pandemic. As Cooper and colleagues (2020) proposed, the decrease in social contact during the COVID-19 lockdown restrictions may be associated with a decrease in social anxiety symptoms and individuals may be less concerned with their body image. One possible explanation is that people are more concerned with keeping their jobs, taking classes, and remaining healthy during the pandemic, and body image may not be as salient on their minds. With decreased face-to-face contact, individuals may be less preoccupied with their body image in social interactions as they would be in-person.

The present findings are also consistent with research by Neuberg and Newsom (1993) and Prokopcáková (2015), which indicated that individuals who prefer more structure in their lives may experience higher social anxiety symptoms. When compared with other mental health outcomes, the results indicated that personal need for structure was not a significant predictor for depressive or disordered eating symptoms. While having a moderate correlation with depressive

and disordered eating symptoms on its own ($r = .26, p < .01; r = .21, p < .01$, respectively), need

for structure did not predict depressive or disordered eating symptoms when loneliness, body

image, and social media exposure were included. Previous proposed models suggested that

disruption of routine and structure during the COVID-19 pandemic may lead to heightened body

image concern as well as disrupted eating patterns, which are often comorbid with depressive

symptoms (Rodgers et al., 2020). However, this was not found in the current study. Our findings

were also inconsistent with previous research by Haines and colleagues (2010), as well as

Ramalho and colleagues (2021), which suggested that with constraints placed on regular activity,

change of routine and structure may lead to heightened body image concern as well as disrupted

eating patterns. To the contrary, people who valued more structure did not report higher

disordered eating symptoms in this study. Although our finding was unexpected, one possible

explanation is that individuals have developed their own routines after a year into the pandemic.

Additionally, loneliness has been previously implicated as a potential risk factor for

mental health outcomes (Cacioppo et al., 2006; Lim et al., 2016; Pritchard & Yalch, 2009).

These findings were supported within this sample. Individuals who reported higher perceived

loneliness also had elevated social anxiety, depressive, and disordered eating symptoms.

Loneliness is more likely in individuals experiencing social isolation or separation from their

friends or family (Cacioppo et al., 2006). Physical distancing guidelines and self-isolation

mandates during the COVID-19 pandemic may be associated with increased social disconnection

and self-reported loneliness (Killgore et al., 2020). In the life of a college student, feelings of

loneliness may be intensified by being unable to visit friends, have social gatherings, or attend

club meetings. The observed effect sizes of loneliness as a risk factor are large, suggesting that

on a population level, it is likely to have a meaningful impact. Moreover, the pandemic may have

further exacerbated feelings of isolation. Reducing levels of loneliness is important in decreasing risk for social anxiety, depressive, and disordered eating symptoms.

Besides loneliness, social media exposure also posed as a significant risk factor associated with social anxiety, depressive, and disordered eating symptoms during the COVID-19 pandemic. This is consistent with Fernández-Aranda and colleagues' (2020) findings that increased time spent using social media, which has been exacerbated during the COVID-19 pandemic, is a potential risk factors for disordered eating and other mental health repercussions. Increased exposure to unrealistic or unattainable bodies or lifestyles, which are usually highlighted on social media, may explain negative mental health outcomes, including social anxiety, depressive, and disordered eating symptoms. In this sample, individuals who reported higher perceived loneliness and increased social media use, also demonstrated higher social anxiety, depressive, and disordered eating symptoms.

Finally, although this was a cross-sectional study, we did ask participants about perceptions of changes in daily routine, loneliness, body image, and media use during the COVID-19 pandemic, and the sample overwhelmingly reported that in the past six months, they had felt less connected, used more social media, experienced more disruption in schedules, and had more disturbances in body image (See Table 2). Based on self-report, these risk factors were indeed exacerbated during the COVID-19 pandemic. Therefore, we need to screen individuals for these risk factors, incorporate them in prevention and intervention programs, and reduce stigma about the mental health strain associated with the pandemic (Holmes et al., 2020).

Clinical Implications

Moving forward, individuals may benefit from implementing various healthy coping mechanisms to manage significant risk factors experienced during the COVID-19 pandemic. In

the short term, the CDC (2020) recommends reducing social media exposure and limiting phone, television, and computer screen time during idle periods. Taking breaks throughout the day and decreasing social media use may lower the risk for mental health symptoms over time. Too much or too little social media exposure may be associated with higher social anxiety, depressive, and disordered eating symptoms (Bucchianeri et al., 2013; Twenge, 2019). Helping individuals develop a schedule to avoid excessive social media exposure and balance daily social media intake may decrease the risk of developing mental health symptoms. In addition, remaining socially connected in moderation may also help lessen feelings of loneliness, which lower the risk for social anxiety, depressive, and disordered eating symptoms. Despite being advised to remain physically distant from others during the existing pandemic, our findings suggest that individuals should not isolate themselves socially. Talking with others, reaching out for support, and staying connected with online communities may mitigate feelings of loneliness and improve mental health symptoms (CDC, 2020).

Strengths, Limitations, and Future Directions

This study has several strengths and limitations. First, the findings help further our knowledge of risk factors and mental health in the context of the COVID-19 pandemic, as there is limited research on this novel experience. Second, this study contributes uniquely to the existing literature because it is the first to examine risk factors for social anxiety, depressive, and disordered eating symptoms separately and simultaneously in the context of the COVID-19 pandemic. Furthermore, the study provides information that is important to consider for both the short-term and long-term effects of the pandemic because it examines risk factors that may be targeted in prevention and intervention programs.

Despite efforts to diversify our sample and recruit more participants by extending recruitment to social media, the study was limited by lack of sample diversity. The sample included participants with a mean age of 24.74 and mostly consisted of college students (> 80%) and individuals who identified as women (>75%). In addition, 67.8% of the sample consisted of non-Hispanic White individuals. Possible implications for these limitations include differences in relevance of risk factors and prevalence of symptoms. For example, young female college students may display more body image concerns compared to a general population. Furthermore, this study primarily relied on self-reported measures that required participants to remember certain experiences in the context of the pandemic. If self-reported answers are exaggerated or not completely honest, they may contribute to skewed results in the analysis. Future studies should include a broader sample of men and women that are distributed across various age groups, gender, race, and ethnicity to gain a better understanding of the continuing effects of the COVID-19 pandemic as well as how the implementation of vaccines may have changed risk factors and mental health symptoms.

In conclusion, the COVID-19 pandemic has disrupted various aspects of life and has presented a number of unprecedented challenges. The results of this study in general support the notion that changes in need for structure, loneliness, body image, and social media use in the context of COVID-19 pose as risk factors for mental health. In addition, considering that the pandemic is still ongoing, these results point to the need for interventions for social anxiety, depressive, and disordered eating symptoms that encourage the need for more structure, social connection, positive body image, and mindful social media use. These findings suggest the importance of reducing stigma, maintaining social interactions in a safe way, creating schedules

to maintain structure, finding balance in social media use, and providing mental health resources

to reduce symptoms and improve mental health during the COVID-19 pandemic.

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Table 1

Demographics

	n	*%*
Gender	239	100
Female	189	79.1
Male	47	19.7
Non-Binary	3	1.3
Race	239	100
Black/African American	16	6.7
Hispanic	24	10.0
Asian	14	5.9
White/Caucasian	162	67.8
Native American/Pacific Islander	1	.4
Multiracial/Biracial	22	9.2
Education Level	238	99.6
High School Degree or Equivalent	61	25.6
Some College	110	46.2
2-Year Degree	24	10.1
Bachelor's Degree	28	11.8
Master's Degree	8	3.4
Doctorate	5	2.1
Other	2	.8
College Student	239	100

Current college student	199	83.3
Not a college student	40	16.7
Class Standing	198	82.8
First Year	75	37.9
Sophomore	42	21.2
Junior	41	20.7
Senior	36	18.2
Graduate Student	3	1.5
Other	1	.4
Depression Diagnosis	239	100
Have been diagnosed	49	20.5
Have not been diagnosed	190	79.5
Anxiety Disorder Diagnosis	239	100
Have been diagnosed	67	28.0
Have not been diagnosed	172	72.0
Eating Disorder Diagnosis	239	100
Have been diagnosed	15	6.3
Have not been diagnosed	224	93.7

Table 2

Pandemic Perceptions

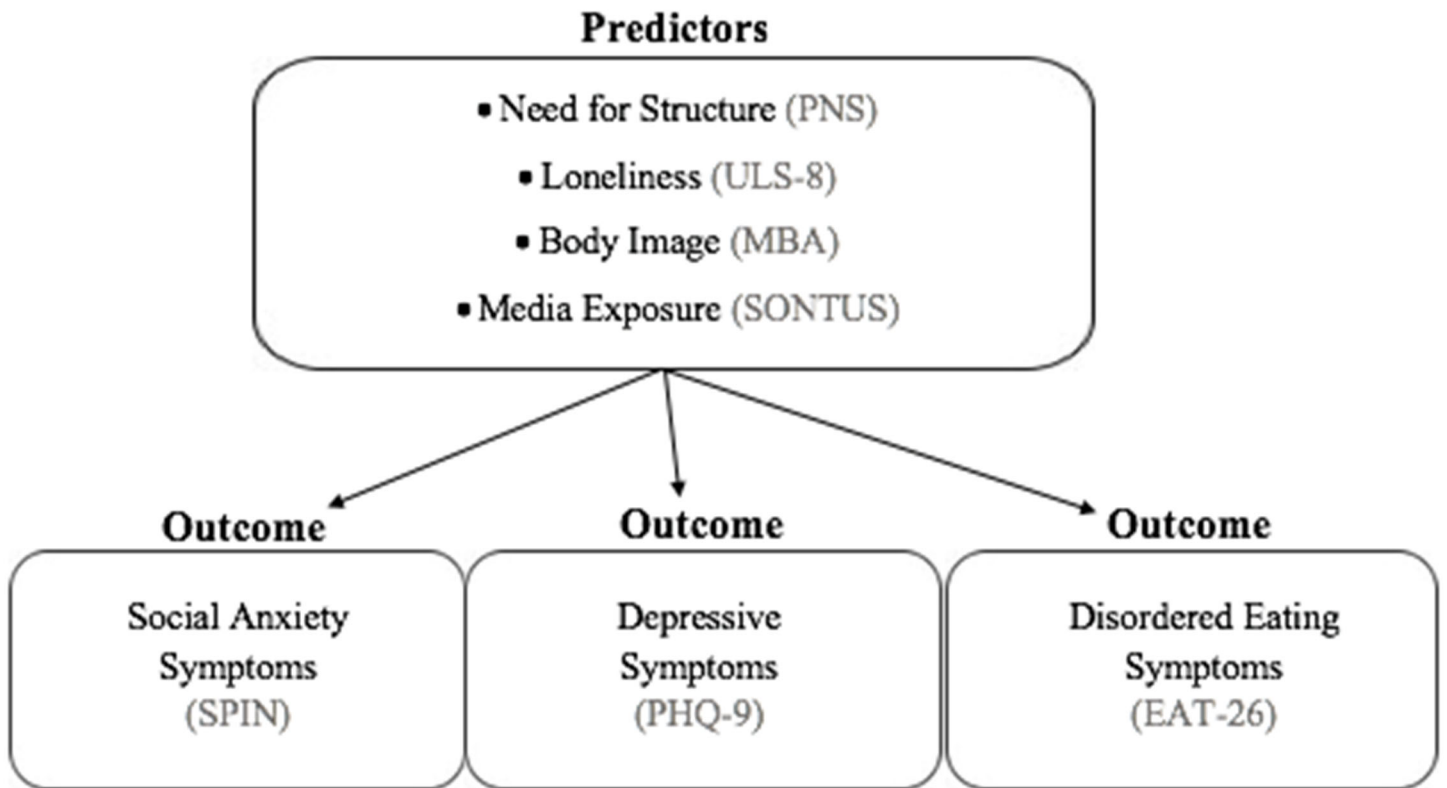|	*n*	*%*
COVID-19 Daily Routine Change	239	100
Somewhat, Very Much, Extremely	208	87
COVID-19 Loneliness Change	239	100
Somewhat, Very Much, Extremely	180	75.3
COVID-19 Body Image Change	239	100
Somewhat, Very Much, Extremely	154	64.4
COVID-19 Media Use Change	239	100
Somewhat, Very Much, Extremely	192	80.3

Table 3

Descriptive Statistics and Correlations

	M (SD)	1	2 [a]	3	4 [a]	5	6	7
1. Personal Need for Structure (PNS)	48.11 (7.53)	1	-.263**	.331**	-.134*	.385**	.225**	.209*
2. Loneliness (ULS) [a]	21.51 (4.9)		1	-.256**	.299**	-.536*	-.574**	-.271**
3. Body Image (MBA)	22.58 (6.85)			1	-.283**	.290**	.308**	.360**
4. Social Media Exposure (SONTUS) [a]	62.49 (21.71)				1	-.309**	-.339*	-.283**
5. Social Anxiety Symptoms (SPIN)	24.5 (14.55)					1	.541*	.320**
6. Depressive Symptoms (PHQ-9)	8.05 (6.62)						1	.420**
7. Disordered Eating Symptoms (EAT-26)	10.97 (9.99)							1

Note: *$p \leq .05$ level (2-tailed); **$p \leq .01$ level (2-tailed)

Note: [a] High score of ULS and SONTUS indicate low loneliness and social media use, respectively.

Figure 1

Proposed Model

Predictors

- Need for Structure (PNS)
- Loneliness (ULS-8)
- Body Image (MBA)
- Media Exposure (SONTUS)

Outcome

Social Anxiety
Symptoms
(SPIN)

Outcome

Depressive
Symptoms
(PHQ-9)

Outcome

Disordered Eating
Symptoms
(EAT-26)

Note. Summary of the pathways through which the COVID-19 pandemic may predict social anxiety, depressive, and disordered eating symptoms.