The Impact of Covid-19 Related Stress on Mental Health, Body Image and Disordered Eating Levels Among Third-Level Education Students; Gender Differences

Name: Lauren Buckley

Student Number: x19418282

Supervisor: Dr. Michelle Kelly

BA (Hons) Psychology

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Abstract

Aims: The current study examined the impact of Covid-19 related stress on depression, anxiety, disordered eating and body image, as the current literature demonstrates that Covid-19 and its related stressors are having detrimental effects on individuals, specifically among third-level education students. The study sought to provide a deeper understanding of the consequences of the pandemic on third-level students' psychological outcomes within an Irish context, while also examining gender differences in Covid-19 related stress levels and body image. **Method:** 151 participants took part, the survey was comprised of demographical questions, the Patient Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder Assessment (GAD-7), the Eating Disorder Examination Questionnaire Short (EDE-QS), the Body Image States Scale (BISS) and a modified version of the Covid-19 Student Stress Questionnaire (CSSQ). **Results:** Hierarchical linear regressions revealed that Covid-19 related stress significantly predicted depression, anxiety, body image and disordered eating levels. Significant gender differences were found, where females exhibited higher Covid-19 related stress levels and poorer body image outcomes. **Conclusion:** The findings showcase that Covid-19 related stress is still functioning as a contributor to aversive psychological outcomes, even as Ireland is returning to normality. Implications of the findings and future research directions are further discussed.

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Literature Review

The World Health Organisation (WHO) announced a global pandemic during March of 2020, due to the rapid transmission of Covid-19 throughout the world (WHO, 2020). Strict mitigation measures, such as lockdowns were introduced to help contain the virus (Alfano & Ercolano, 2020). Researchers anticipate that Covid-19 will have a detrimental impact on individuals, as past occurrences of quarantine, epidemics and natural disasters provide an insight into the possible negative psychological consequences of the current pandemic (Brooks et al., 2020; Esterwood & Saeed, 2020). The following literature review will discuss how Covid-19 is impacting individuals with a focus on mental health, body image, disordered eating and specifically its effects on college students.

As a result of the emergence of Covid-19, the world was put in a vulnerable state, as the virus poses a threat to individuals' physical health (Huang et al., 2020). It is also important to consider the impact of these unprecedented times on individuals' psychological states. The pandemic introduced a host of new stressors. Researchers have outlined them as primary stressors, which are disease-related stressors, for example, the mortality of a family member due to Covid-19. The other stressors are known as secondary stressors, which include isolation, disruption to daily life and financial issues (Zheng et al., 2021). It is anticipated that these stressors will have detrimental effects on psychological outcomes and potentially lead to an increased risk of suicide (Esterwood & Saeed, 2020; Xiong et al., 2020). Elbogen and colleagues (2021) found that Covid-19 related stress symptoms were associated with suicidal thoughts, demonstrating the importance of understanding the role of Covid-19 related stress during the pandemic. These new pandemic-related stressors observed are very important to monitor, as general stressors are linked to poor mental health (Lester, 2014; Wahab et al., 2013) and previous

research before the pandemic has shown how detrimental stressors such as isolation can be for mental health (Hawryluck et al., 2004; Matthews et al., 2015).

The pandemic has caused a surge of research, which has sought to examine the outcomes of Covid-19. Past studies have shown how impactful stressful situations are for individuals' psychological health, as exposure to stressful life events is associated with eating disorders (Lie et al., 2021), depression (Hetolang & Amone-P'Olak, 2017) and suicidal ideation (Liu & Miller, 2014). In cases of situations comparable to Covid-19, past virus outbreaks provide an important insight into the implications that may follow the current pandemic (Chau et al., 2021; Esterwood & Saeed, 2020). As a result of the Severe Acute Respiratory Syndrome (SARS) outbreak, healthcare workers suffered from chronic stress, depression and anxiety a year after the epidemic ended, psychiatric morbidities were also sustained among SARS survivors from the general population after a year (Lam et al., 2009; McAlonan et al., 2007). Similarly for the Ebola epidemic, Ebola survivors experienced long-term mental health effects (Bah et al., 2020). The previously outlined epidemics are similar to the current pandemic, as they involved the spreading of a virus, mitigation measures and aversive psychological outcomes (Bah et al., 2020; Esterwood & Saeed, 2020; Wilder-Smith, 2021). In comparison to previous outbreaks, Covid-19 is impacting the world on a more global level compared to SARS, which infected 8,096 individuals (WHO, 2003) and Ebola, which infected 28,616 individuals (WHO, 2016), as Covid-19 has infected over 352 million individuals (WHO, 2022). The higher infection rates are believed to occur as a result of the timing of transmission and the asymptomatic rate of Covid-19 (Wilder-Smith, 2021). The previously mentioned outbreaks demonstrate the importance of understanding the impact of the current pandemic on mental health.

Mental Health and Covid-19

A substantial amount of research has been carried out concerning how Covid-19 is shaping individuals' mental health and the consensus is that the pandemic is a serious detriment to mental health (Chekole & Abate, 2021; Saragih et al., 2021). The evidence links Covid-19 to a deterioration in mental health across many different contexts, as psychological distress, depression and anxiety levels increased among individuals in Canada (De France et al., 2021), Poland (Chodkiewicz et al., 2021), France (Husky et al., 2020), Italy (Amendola et al., 2021) and Spain (Rodríguez-Rey et al., 2020). The pandemic is also impacting different sub-groups (Facer-Childs et al., 2021; Hawke et al., 2021; Ma et al., 2021), specifically college students (Li et al., 2021). Being impacted by the stressors imposed, it is predicted that this group will be particularly affected in the context of the pandemic (Sahu, 2020; Yang et al., 2021; Zhai & Du, 2020), as prior to the pandemic, college students were increasingly considered a vulnerable group, due to their poor mental health (Bruffaerts et al., 2018). The pandemic also introduced major stressors to college students, including disruption to the education system, limited travel and fear of contagion, which are believed to significantly impede students' mental health and socialisation (Cao et al., 2020; Fruehwirth et al., 2021; McLafferty et al., 2021).

In a meta-analysis and systematic review (Li et al., 2021), it was observed that students' mental health suffered significantly due to the pandemic, providing evidentiary support for the predictions previously outlined. Many studies recorded a higher prevalence of depression, anxiety and stress among college students during the pandemic (Kecojevic et al., 2020; Wang et al., 2020a; Li et al., 2021) and other studies have established significant relationships between Covid-19 related stress and poor mental health outcomes (Fruehwirth et al., 2021; Karing, 2021), this showcases how vulnerable college students are in the context of the pandemic. It is clear that

the pandemic is having significant effects on college students' mental health, however, the studies are subject to limitations and gaps in the current states of knowledge. The majority of studies carried out on college students examine the effects of Covid-19 at the beginning of the pandemic during critical periods (Coughenour et al., 2020; Kecojevic et al., 2020; Son et al., 2020; Wang et al., 2020a) and the emerging research regarding the potential long-term outcomes of the pandemic is scarce and have produced mixed findings (Bourmistrova et al., 2022; Rogowska et al., 2021). Researchers have identified that it is vital to continue researching whether the effects of Covid-19 persist as the pandemic continues (De France et al., 2021; Son et al., 2020; Wang et al., 2020a). Further research is therefore necessary to analyse the mental health of students when the pandemic is exiting critical periods, to understand if the Covid-19 related stressors produce lasting effects, as past virus outbreaks have produced long-term effects on individuals' mental and physical wellbeing (Lam et al., 2009; McAlonan et al., 2007).

Another limitation outlined by Li and colleagues (2021), is that the effects of Covid-19 on mental health can depend on the individual's country of origin. Chinese individuals had better mental health outcomes compared to non-Chinese individuals. The authors believe this was due to the strict policies imposed in China, which helped control the pandemic efficiently, ultimately resulting in an increase in individuals' confidence and a decrease in the negative psychological implications (Lau et al., 2020; Li et al., 2021; Pan et al., 2020). In relation to Irish studies conducted during Covid-19, there has been little research on college students. However, an Irish study found moderate to extreme levels of stress among medical students and Covid-19 related stressors were significantly associated with students' stress levels (O'Byrne et al., 2021). This indicates that the pandemic may be affecting Irish students and that further research is necessary to understand how Covid-19 related stress impacts Irish college students' mental health, as the

previous study only looked at medical students. To the researcher's knowledge, there are also no studies that assess the link between Covid-19 related stress and other aversive psychological outcomes, such as anxiety and depression, using an Irish student sample. While the negative mental health outcomes are well documented and anticipated in the midst of the pandemic, Covid-19 related stress may impact other dimensions of wellbeing. A particular area of concern is how the pandemic/Covid-19 related stressors are affecting individuals' body image and disordered eating symptomology (Cooper et al., 2020; Touyz et al., 2020).

Body Image and Disordered Eating

Body image is a multi-dimensional construct, referring to how an individual thinks, perceives and acts towards their body (Thompson et al., 1999). Disordered eating relates to various abnormal eating behaviours (Pereira & Alvarenga, 2007). Studies have shown that college students, females particularly, have a poor view of their bodies (Forrester & Stuhldreher, 2007; Neighbors & Sobal, 2007). Body dissatisfaction is associated with and predicts disordered eating habits (Wertheim et al., 2001) and diminished mental health (Barnes et al., 2020; Bornioli et al., 2020). Researchers believe that the pandemic will subsequently result in significant ramifications on individuals' body image and disordered eating habits due to the emerging psychosocial stressors introduced by Covid-19, such as increased exposure to social media (Cooper et al., 2020; Rodgers et al., 2020; Touyz et al., 2020). Body image and disordered eating tendencies are under-researched compared to mental health during the pandemic (Ahuja & Banerjee, 2021; Ramalho et al., 2021). However, the emerging research suggests that the pandemic and Covid-19 related stress is reaping adverse consequences on body image and disordered eating behaviours. Covid-related anxiety significantly predicted body dissatisfaction among men and women, Covid-19 related stress/anxiety also predicted drive for thinness among

women and muscularity dissatisfaction in men (Swami et al., 2021a), and an increase in disordered eating and worsened body image was recorded among former and current athletes (Buckley et al., 2021). It is hypothesized that Covid-19 related stress reduces coping abilities in relation to body image threats (Swami et al., 2021a) and Covid-19 related changes to daily routine potentially exacerbate disordered eating symptomology (Rodgers et al., 2020). Contradictory findings have been reported, as there were no significant changes in body image and disordered eating among Lithuanian students during the pandemic. However, internalisation of beauty ideals and internet browsing significantly increased, the researchers believe that this may affect students' body image after lockdown (Baceviciene & Jankauskiene, 2021). In light of these non-significant findings, it is important to mention that Swami and colleagues (2021a), found no relationship between Covid-19 related stress and body dissatisfaction. This possibly resulted from their novel scale, as it was not utilised in previous studies, which may have affected the outcomes. In Buckley and colleagues' study (2021), their sample limits generalisability of the findings, as athletes were already a population at risk for eating disorders prior to the pandemic (Sundgot-Borgen & Torstveit, 2004). These mixed findings highlight the need for further investigation, to establish the link between Covid-19 related stress and negative body image and disordered eating.

Concerning gender differences regarding mental health, there is a relatively consistent trend observed, where females seem to be particularly impacted by the pandemic, as they exhibit poorer mental health compared to males (Alonzi et al., 2020; Amendola et al., 2021; Best et al., 2021; Gualano et al., 2020; Prowse et al., 2021). This finding aligns with research carried out before the pandemic, as being female was deemed a risk factor for the development of mental health issues and internalising disorders (Boyd et al., 2015; Campbell et al., 2021). However,

there are contradicting findings, as Ahmed and colleagues (2020) found no gender differences in relation to poor mental health outcomes and De France and colleagues (2021) observed a significant increase in depression for males, while females experienced increased anxiety during the pandemic. Similar findings were observed relating to body image, which was affected by Covid-19 related anxiety for males and females (Swami et al., 2021a). These opposing findings may have resulted from potentially non-generalisable samples, as De France and colleagues'(2021) sample consisted of adolescents, this is significant as adolescents experience a tumultuous developmental period thus resulting in differential effects and Ahmed and colleagues' (2020) sample was mainly individuals from the epicentre of the pandemic, possibly introducing bias due to exaggerated fears of contagion. These mixed findings illustrate that both genders are critical to monitor, as the pandemic has the ability to manifest negative body image and mental health outcomes in males and females.

The Present Study

As Covid-19 continues to impact individuals globally, it is vital to continue investigating the psychological burden imposed by the context of the pandemic on college students, as they were growingly considered a vulnerable population pre-Covid-19 (Balon et al., 2015; Bruffaerts et al., 2018). There is speculation that the Covid-19 related stressors will majorly impact their mental health (Baik et al., 2019; Sahu, 2020). A significant deterioration in the mental health of students has already been demonstrated (Li et al., 2021). However, there are important gaps in the literature concerning the impact of Covid-19 related stress on body image and disordered eating, as there have been mixed findings and limited studies conducted (Baceviciene & Jankauskiene, 2021; Swami et al., 2021a). The studies carried out so far support the idea that the pandemic poses a risk factor for poor body image and eating disorder symptomology (Buckley et

al., 2021; Swami et al., 2021a). It is important to understand the implications of the pandemic in Ireland and see how Covid-19 related stress may be differentially affecting third-level education students, as Ireland is currently easing out of restrictions (Citizens Information, 2022) and there is a lack of research on the Irish student population and how a context with reduced measures may be contributing to psychological outcomes.

Researchers have outlined the importance of understanding the lasting effects of the pandemic, as previous outbreaks have resulted in long-term psychological effects (McAlonan et al., 2007; Son et al., 2020). Extending the current knowledge may encourage colleges to devise interventions that will help alleviate these aversive effects.

Aims, Research Questions and Hypotheses

The main aim of the current study is to gauge an understanding of the impact of Covid-19 related stress on mental health, body image and disordered eating levels among third-level education students and examine gender differences in relation to Covid-19 related stress levels and body image. The following research questions and hypotheses will be examined:

Research question 1: Will Covid-19-related stress significantly predict depression levels?

Hypothesis 1: Covid-19-related stress will significantly predict depression levels.

Research question 2: Will Covid-19-related stress significantly predict anxiety levels?

Hypothesis 2: Covid-19-related stress will significantly predict anxiety levels.

Research question 3: Will Covid-19-related stress significantly predict disordered eating levels?

Hypothesis 3: Covid-19-related stress will significantly predict disordered eating levels.

Research question 4: Will Covid-19-related stress significantly predict body image?

Hypothesis 4: Covid-19-related stress will significantly predict body image.

Research question 5: Is there a significant gender difference in Covid-19-related stress levels and body image?

Hypothesis 5 There will be a significant gender difference in Covid-19 related stress levels and body image.

Method

Participants

For the current study, participants were recruited via convenience sampling. A poster was created, providing details of the nature of the study, the inclusion and exclusion criteria. The study was shared on social media platforms from the researcher's personal accounts, including Facebook, Instagram and Snapchat. The link for the online survey was provided in the poster and on the researcher's social media accounts. G*Power Statistical Power Analyses (Faul et al., 2009) was used to estimate the sample size for the study. It was estimated based on a hierarchical linear regression analysis, that a minimum of 89 individuals were required for the study.

The sample for the current study originally consisted of 165 individuals, including females (n=115), males (n=45) and individuals who did not identify as male or female, which were denoted as 'other' in the survey (n=5). The chosen demographic were students attending third-level education in Ireland, as this demographic was imperative to the research questions. There were no specific age groups outlined for the inclusion criteria, however, it was required that individuals were 18 or over to participate. 14 individuals were excluded from the data, as they were either underage or did not attend a third-level institution. The final research sample consisted of 151 third-level education students, including 108 females, 40 males and 3 individuals who identified as 'other'. The participants' age ranged from 18 to 59 years, the average age was 23 (SD=8.67). Individuals took part without compensation for their participation.

Design

The current study adopted a cross-sectional design and was quantitative in nature. For the first four research questions, four separate hierarchical linear regressions were used to investigate

the impact of Covid-19 related stress across four measures. The predictor variables were Covid-19 related stress and gender and the criterion variables for the hierarchical linear regressions were depression, anxiety, disordered eating and body image. These four inferential tests were chosen to determine if Covid-19 related stress is significantly predicting scores for the criterion variables. For the final research hypothesis, two ANOVAs were chosen to examine if there are significant gender differences in relation to Covid-19 related stress levels and body image. Gender is the independent variable and body image and Covid-19 related stress are the dependent variables.

Materials

The online survey for the current study was comprised of demographical questions and five scales. Firstly participants encountered three questions measuring demographical attributes, including age, gender and if they attended a third-level institution. After, participants moved on to the following questionnaires.

Patient Health Questionnaire (PHQ-9); The PHQ-9 is a widely used measure for screening depression severity and depression symptomology. The scale contains 9 items and is scored on a four-point Likert scale, ranging from zero (not at all) to three (nearly every day) (see Appendix A). Participants rate how often in the last two weeks they have experienced depressive symptoms. In relation to scoring, points are added to get a total score, the minimum score is zero and the maximum score is twenty-seven, higher scores indicate higher levels of depression severity. There are specific cut-off scores, which demonstrate the individual's current depressive state, for example, a score between 20-27 indicates severe depressive symptoms. The PHQ-9 has excellent psychometric properties, regarding test-retest reliability, construct validity and internal

consistency (α=.89) (Kroenke et al., 2001). For the current sample, the Cronbach's Alpha was α=.85.

General Anxiety Disorder Assessment (GAD-7); The GAD-7 is a 7-item measure and is scored in a similar manner as the PHQ-9. The GAD-7 measures symptomology and severity of Generalised Anxiety disorder (GAD), higher scores mean higher levels of anxiety and GAD severity. The seven items are scored on a four-point Likert, which ranges from zero ='not at all sure' to three ='nearly every day' (see Appendix B). Participants answer how often they have experienced anxiety symptoms in the last two weeks. The minimum score is 0 and the maximum score is 21. There are specific cut-off scores that reflect the individual's anxiety level. For example, a score greater than 15 indicates severe levels of anxiety. The scale demonstrates construct, criterion and factorial validity and good internal consistency (α=.92) (Spitzer et al., 2006). For the current sample, the Cronbach's Alpha was α=.90.

Eating Disorder Examination Questionnaire Short (EDE-QS); The EDE-QS is a 12-item scale and a shortened version of the Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994; Gideon et al., 2016). Items on the questionnaire are scored on a four-point Likert scale. The scale measures levels of disordered eating and contains questions relating to eating disorder symptomology typically seen in eating disorders. Participants rate from zero to three how frequently they experience the stated symptoms over the past seven days (see Appendix C). The minimum score is 0 and the maximum is 36. Higher scores obtained from the EDE-QS indicate higher levels of eating disorder symptomology. A score of 15 or over indicates potentially clinically significant eating disorder symptomology (Prnjak et al., 2020). The EDE-QS received an excellent internal consistency score (α=.91) (Gideon et al., 2016). For the current research sample, the Cronbach's Alpha was α=.91.

Body Image State Scale (BISS); The BISS consists of 6 items and is a measure of body image, which captures the individual's momentary affect experience in relation to their body and how they feel towards their body (Cash et al., 2002). Participants score each item on a 9-point bipolar Likert-type scale, as for three of the items the direction of the nine choices go from negative to positive and the reverse occurs for the other three items, meaning three items are reversed scored (see Appendix D). The 9 responses vary for each question. Participants ultimately rate how satisfied/dissatisfied they are across various domains, such as physical appearance. Lower scores indicate higher body image dissatisfaction, while higher scores indicate a more positive body image. The BISS has been utilised in other studies and has adequate internal consistency (α=.87)(Etu & Gray, 2010). For the current sample, the Cronbach's Alpha was α=.82.

Covid-19 Student Stress Questionnaire (CSSQ); The CSSQ is a relatively new questionnaire, which emerged as a result of the current pandemic to capture students' stress levels related to Covid-19 (Zurlo et al., 2020). It was originally a 7-item measure (see Appendix E) and was adapted for the current study. Two new questions were added and the tense was changed from present to past tense (see Appendix F). A pilot study was conducted to ensure there were no issues with the adapted questionnaire. In relation to scoring, individuals rate each item on a five-point Likert scale ranging from 0='not at all stressful' to 4='extremely stressful'. The questionnaire produces a total global score, the original questionnaire ranged from 0 to 28 and the adapted version ranges from 0 to 36, higher scores indicate higher levels of Covid-19-related stress. The original seven items received an acceptable internal consistency score (α=.71) and demonstrated convergent and discriminant validity (Zurlo et al., 2020). For the current sample, the modified CSSQ's Cronbach's Alpha was α=.85.

Procedure

Pilot study

A pilot study was conducted, which consisted of three participants, recruited via convenience sampling. The sample included two females and one male, all of which fitted the inclusion and exclusion criteria. A pilot study was utilised to assess understanding and comprehension of the adapted questionnaire. Two significant changes were made to the CSSQ (see Appendix F), where two new questions were added, which were questions 8 and 9. These questions asked how stressful the pandemic has been on body image, disordered eating and mental health, as these stressors were not considered in the original CSSQ. The tenses of the questions were changed from present to past tense to align with the current state of the pandemic in Ireland, as the CSSQ was created to capture stress during lockdown. Participants were messaged on social media and asked in an ethical manner to partake in the pilot study. Each individual agreed. Participants were sent the link and asked to provide feedback, as well as the time it took to complete. The pilot study was a success, as there were no issues with the questionnaires. The whole survey took roughly 5-10 minutes to complete. As a result of this positive feedback, no changes were made to the survey and the data from the pilot study was kept. This pilot study ensured that the adapted CSSQ was appropriate to utilise for the study.

Current study

After the pilot study was conducted, the actual research study commenced. The researcher created the online survey on google forms. A poster was created providing a brief summary of the nature of the study and who is eligible to participate, the link for the survey was provided in the poster. The poster was shared on social media platforms. Clicking the link brought the individual directly to the survey. The information sheet was first displayed, entailing

the nature of the study, the participants' rights, the types of questions that will be asked and the inclusion and exclusion criteria (see Appendix G). The researcher's and researcher's supervisor's contact details were provided, for any queries. After the participant progressed to the consent page. The participant was shown a list of statements confirming their understanding of the nature of the study and their rights (see Appendix H). In order for participants to access the questionnaires, informed consent was mandatory.

After providing consent the participant progressed on to the demographical questions (see Appendix I) and then proceeded onto the scales. The layout of the scales was as follows; participants answered the PHQ-9, the GAD-7, the EDE-QS, the BISS and the adapted CSSQ. When all questions were completed and submitted, the participant was fully debriefed. In the debriefing form, participants were sincerely thanked for their participation. In the event where a participant experienced distress as a result of the survey, appropriate support services' contact details tailored to the research topics, were listed for the participant to avail of (see Appendix J). The researcher's details were also listed if the participant had further questions. The survey was available from November of 2021 until January 2022.

Ethical Considerations

The current study was approved by the National College of Ireland's ethics committee and throughout the entire research process, the researcher has abided by the NCI Ethical Guidelines and Procedures for Research involving Human Participants (2017). In accordance with the ethical guidelines, participants were made aware that their participation was voluntary and it was their right to forfeit participation at any point throughout the study, without any repercussions. Individuals were made aware of the potential risks before they participated and following survey completion, participants were fully debriefed.

Results

Descriptive statistics

Descriptive statistics were performed for the categorical variable gender and the continuous variables, including age, depression, anxiety, disordered eating, body image and Covid-19 related stress. The sample consisted of 151 individuals, attending a third-level institution. There was a disproportionate number of males compared to females, as 71.5% of the sample was female (n=108) and 26.5% was male (n=40) and 2% identified as 'Other' (n=3). For the continuous variables, information regarding their Means, Standard Errors, Medians, Standard Deviations and Range is reported in Table 1. Each variable's normality was assessed. Depression, anxiety, Covid-19 related stress and body image displayed relatively normally distributed data, as the histograms resembled a bell curve with minimal skewness, Q-Q plots showed little deviation in scores and the skewness and kurtosis values were within the acceptable range. Two variables indicated non-normally distributed data, which were age and disordered eating. Both variables had extremely positively skewed data and received a statistically significant result on the Kolmogorov Smirnov test of normality. No outliers/extreme scores were present for any of the variables except age, this can be explained as all ages were eligible to partake. See Appendix K for SPSS dataset and output.

Table 1

Descriptive statistics for continuous variables (n=151).

Variable	Mean[95%Confidence Intervals]	Std.Error Mean	Median	SD	Range
Age	23.54(22.14-24.93)	.71	20	8.67	18-59
Depression	13.06(12.08-14.04)	.49	14	6.08	1-27

Anxiety	11.76(10.83-12.68)	.47	12	5.78	0-21
Disordered Eating	13.39(11.94-14.8)	.74	13	9.08	0-32
Body Image	26.39(24.86-27.93)	.78	28	9.55	6-49
Covid-19 Related Stress	21.95(20.66-23.25)	.66	23	8.06	0-36

Inferential Statistics

For the analyses, individuals who identified as 'other' were excluded from all hierarchical linear regressions. The heterogeneity in variances across the gender groupings was too large and the number of observations was too small to make any meaningful contribution to the analyses. Leaving this group in for the regressions may have affected the result or produced outcomes that could not be replicated or representative of that cohort. Another aspect to note is that correlations were run as a first step in understanding the association between Covid-19 related stress and the criterion variables (see Table 2).

Hypothesis 1

A hierarchical linear regression was used to investigate the impact of Covid-19 related stress on depression levels when controlling for gender. Covid-19 related stress and gender are the predictor variables and depression is the criterion variable. Preliminary analyses indicated that there was no violation of the assumptions of linearity, normality, multicollinearity and homoscedasticity. Correlational analysis was conducted before the hierarchical linear regression. The Pearson correlation coefficient was utilised to investigate the relationship between Covid-19 related stress and depression. There was a strong, positive correlation between the two variables (r=.58, n=151, p<.001). For the hierarchical linear regression, gender was entered at step 1, model 1 explained 5.5% variance in depression levels (F(1,146)=8.56, p=.004). At step 2 the variable Covid-19 related stress was entered, the total variance explained by the model was

33.8% (F(2,145)=36.98, p<.001). Covid-19 related stress predicted an additional 28.2% of the variance in depression levels (R squared change=28.2, F change (1,145)=61.84, p<.001). In the final model, Covid-19 related stress was the only predictor that was statistically significant in predicting depression levels (*beta*=.56, p<.001)(see Table 3). Covid-19 related stress made a statistically significant contribution in predicting depression levels when controlling for gender.

Hypothesis 2

A hierarchical linear regression was used to investigate the impact of Covid-19 related stress on anxiety levels when controlling for gender. Covid-19 related stress and gender are the predictor variables and anxiety is the criterion variable. Preliminary analyses indicated that there was no violation of the assumptions of linearity, normality, multicollinearity and homoscedasticity. Firstly, a Pearson's correlation coefficient assessed the relationship between Covid-19 related stress and anxiety levels. There was a statistically significant, strong, positive relationship between the two variables (r=.51, n=151, p<.001). For the hierarchical linear regression, gender was entered at step 1, model 1 explained 14.2% variance in anxiety levels. At step 2 Covid-19 related stress was entered, the total variance explained by the model was 30.3% (F(2,145)=31.57, p<.001). Covid-19 related stress predicted an additional 16.1% of the variance in anxiety levels (R squared change=16.1, F change (1,145)=33.58, p<.001). In the final model, Covid-19 related stress and gender were both statistically significant in predicting anxiety levels, with Covid-19 related stress recording a higher beta value (*beta*=.43, p<.001) compared to gender (*beta*=.23, p=.002). Covid-19 related stress made a statistically significant contribution in predicting anxiety levels when controlling for gender (see Table 3).

Hypothesis 3

A hierarchical linear regression was used to investigate the impact of Covid-19 related stress on disordered eating when controlling for gender. Covid-19 related stress and gender are the predictor variables and disordered eating is the criterion variable. Preliminary analyses were performed to ensure no violation of the assumptions of linearity, normality, multicollinearity and homoscedasticity. The assumption of normality was violated. A log transformation was performed on disordered eating before hierarchical regression analysis, to account for the non-normally distributed data. After the log transformation, the assumptions of the regression were satisfied, however, scores exhibited slight deviation in relation to linearity. For the correlation analysis, a non-parametric test called the Spearman's Rank order correlation coefficient was utilised, to assess the relationship between Covid-19 related stress and disordered eating. There was a statistically significant moderate, positive relationship between the two variables (r_s =.48, n=151, p<.001).

For the hierarchical linear regression, gender was entered at step 1, model 1 explained 12.8% variance in disordered eating levels (F(1,141)=20.77, p<.001). At step 2 Covid-19 related stress was entered, the total variance explained by the final model was 28.5% (F(2,140)=27.9, p<.001). Covid-19 related stress predicted an additional 15.7% of the variance in disordered eating levels (R squared change=.157, *F* change (1,140)=30.65, p<.001). In the final model, Covid-19 related stress and gender were both statistically significant in predicting disordered eating levels, with Covid-19 related stress recording a higher beta value (*beta*=.42, p<.001) compared to gender (*beta*=.22, p=.005). Covid-19 related stress made a statistically significant contribution in predicting disordered eating levels, when controlling for gender (see Table 3).

Hypothesis 4

A hierarchical linear regression was used to investigate the impact of Covid-19 related stress on body image when controlling for gender. Covid-19 related stress and gender are the predictor variables and body image is the criterion variable. Preliminary analyses were performed to ensure no violation of the assumptions of linearity, normality, multicollinearity and homoscedasticity. Firstly, a Pearson's correlation coefficient was conducted to assess the relationship between Covid-19 related stress and body image. There was a statistically significant, negative, moderate relationship between the two variables (r=-.35, n=151, p<.001). After correlation analysis the hierarchical linear regression was performed, gender was entered at step 1, model 1 explained 7.6% variance in body image scores (F(1,146)=11.97, p=.001). At step 2, Covid-19 related stress was entered, the total variance explained by the final model was 15.1% (F(2,145)=12.85, p<.001). Covid-19 related stress predicted an additional 7.5% of the variance in body image (R squared change=.075, F change (1,145)=12.77, p<.001). In the final model, Covid-19 related stress and gender were both statistically significant in predicting body image. Covid-19 related stress recorded a higher beta value (*beta*=-.29, p<.001) compared to gender (*beta*=-.18, p=.030). Covid-19 related stress made a statistically significant contribution in predicting body image scores when controlling for gender (see Table 3).

Table 2

Pearson's Product moment and Spearman's Rank Order correlations (n=151).

Variables	1	2	3	4	5
Depression	1				
Anxiety	.68***	1			
Disordered Eating	.51***	.4***	1		
Body image	-.48***	-.31***	-.58***	1	
Covid-19 related stress	.58***	.51***	.48***	-.35***	1

Note: Statistical significance: *p<.05;**p<.01;***p<.001

Table 3

Hierarchical linear regressions.

Variable	R^2	R^2 *Change*	*B*	*SE*	*β*	*t*	CI 95% (B)	*p*
Hypothesis 1								
Model 1	.055							.004**
Gender			3.14	1.07	.24	2.93	1.02-5.26	.004**
Model 2	.338	.282						<.001***
Gender			.61	.96	.05	.64	-1.28-2.5	.525
Covid-19 related stress			.42	.05	.56	7.86	.31-.52	<.001***
Hypothesis 2								
Model 1	.142							<.001***
Gender			4.89	.99	.38	4.92	2.92-6.85	<.001***
Model 2	.303	.161						<.001***

Gender			3.03	.95	.23	3.17	1.14-4.92	.002**
Covid-19 related stress			.31	.05	.43	5.8	.20-.41	<.001***
Hypothesis 3								
Model 1	.128							<.001***
Gender			.32	.07	.36	4.56	.18-.46	<.001***
Model 2	.285	.157						<.001***
Gender			.19	.07	.22	2.86	.06-.33	.005**
Covid-19 related stress			.02	.00	.42	5.54	.01-.03	<.001***
Hypothesis 4								
Model 1	.076							.001**
Gender			-5.93	1.72	-.28	-3.46	-9.32-(-2.54)	.001**
Model 2	.151	.075						<.001***
Gender			-3.83	1.75	-.18	-2.19	-7.29-(-.37)	.030*
Covid-19 related stress			-.35	.10	-.29	-3.57	-.54-(-.16)	<.001***

Note: R^2=R-squared; β=standardized beta value; B=unstandardized beta value; SE=Standard errors of B; n=148; Statistical significance:*p<.05;**p<.01;***p<.001.

Hypothesis 5

A one-way between-groups ANOVA was conducted to assess if there were gender differences in Covid-19 related stress levels. Preliminary analyses indicated that there was no violation of the assumption of normality. Further analysis was performed to ensure that there was no violation of the assumption of homogeneity of variance, this was of great importance to check considering the uneven sample sizes for gender (p=.716). Individuals who identified as 'other' were kept for the analysis, as it did not affect the assumptions. Participants were divided into

three groups based on their gender, which consisted of females, males and individuals who identify as 'other'. There was a statistically significant difference found between the gender groups ($F(2,148)=9.31$, $p<.001$). Post hoc comparison using the Tukey HSD test indicated that the Covid-19 related stress levels for females ($M=23.64$, SD=7.44) were significantly ($p<.001$) higher compared to the males ($M=17.58$, SD=8.03). The effect size was calculated using eta squared, which showed a medium effect size (eta squared=.11). Analyses demonstrated that individuals who identified as 'other' did not differ from females or males in Covid-19 related stress levels ($M=19.67$, SD=10.5). It is inferred that females experienced significantly higher levels of Covid-19 related stress in comparison to males.

For the second dependent variable, a one-way between-groups ANOVA was conducted to investigate if there were significant gender differences in body image among participants. Participants were divided into three groups based on their gender, which consisted of females, males and individuals who identify as 'other'. Gender was the independent variable and body image was the dependent variable. Preliminary analyses were performed to ensure there were no violations of the assumption of normality. Further analysis was performed to ensure that there was no violation of homogeneity of variance, analyses revealed that the assumption was satisfied ($p=.197$). There was a statistically significant difference found regarding body image between the gender groups ($F(2,148)=6.15$, $p=.003$). Post hoc comparison using the Tukey HSD test, indicated there was a statistically significant difference between males and females in relation to body image scores. Males' mean scores ($M=30.78$, SD=8.34) were significantly higher compared to the females' scores ($M=24.84$, SD=9.58). The effect size was calculated using eta squared, which displayed a medium effect size (eta squared=.08). Analyses demonstrated that individuals who identified as 'other' did not significantly differ from females or males in relation

to body image. It is inferred females were more dissatisfied with their body image in comparison to males.

Discussion

The overarching aim of the present study was to assess whether or not Covid-19 related stress is predicting levels of depression, anxiety, disordered eating and body image among third-level education students in Ireland. Another key aim of the study was to investigate if there were gender differences in relation to Covid-19 related stress levels and body image. After a thorough analysis of the available research, five hypotheses were put forward and investigated.

For the first hypothesis, it was proposed that Covid-19 related stress would significantly predict depression levels. Findings revealed that the hypothesis was supported, Covid-19 related stress significantly predicted depression levels. The second hypothesis stated that Covid-19 related stress would significantly predict anxiety levels. This hypothesis was supported, as results showed that Covid-19 related stress significantly predicted anxiety levels. The third hypothesis proposed that Covid-19 related stress would significantly predict disordered eating levels. Results showed support for the hypothesis, as Covid-19 related stress significantly predicted disordered eating levels. The fourth hypothesis proposed that Covid-19 related stress would predict body image. This hypothesis was supported, as Covid-19 related stress significantly predicted body image. The fifth hypothesis proposed there would be significant gender differences in relation to Covid-19 related stress levels and body image. The results supported this hypothesis, as statistically significant differences were found. Females had higher Covid-19 related stress levels and lower body image scores compared to males.

Hypothesis 1 & 2

For the first two hypotheses, Covid-19 related stress was found to significantly predict anxiety and depression. This corresponds with previous literature, where significant associations between Covid-19 related measures and poor mental health outcomes were found, insinuating that Covid-19 related stressors are reaping negative mental health consequences among college students (Fruehwirth et al., 2021; Graupensperger et al., 2021; Li et al., 2020). In a study by Karing (2021), which had a similar research design, Covid-19 related stressors were found to be significant risk factors for anxiety, depression and stress among students. However, it is important to note that the Covid-19 related stressors measured for the current study differed slightly from Karing's study, which may explain why our study predicted more variance for anxiety and depression levels, as the CSSQ was specifically tailored to capture stressors experienced by college students (Zurlo et al., 2020), while Karing used a novel scale, potentially leaving out important student-specific stressors, thus influencing their results. This showcases the importance of considering the unique experiences of college students.

The underlying mechanisms of this association are not clearly defined. However, it is believed that coping may play an important role. Coping style refers to how a person protects themselves against a stressor (Lu et al., 2022). Research supports the role of coping as a mediator between stress and the psychological response (Wang & Wang, 2019). Coping was found to partially mediate the relationship between depression and Covid-19 related stressors (Lu et al., 2022), demonstrating that coping style may play a significant role in the mental health effects of Covid-19 related stress. However, further research is required to understand the mechanisms.

This contributes to the current state of knowledge, as previous studies were mainly carried out in early periods of the pandemic (Elmer et al., 2020; Wang et al., 2020a). This finding

demonstrates that Covid-19 related stress is still affecting mental health in a context with minimal restrictions, potentially providing insights into the long-term effects of Covid-19 related stress, which is consistent with findings from the SARS epidemic, where long-term stress effects were observed (Lee et al., 2007). These results also demonstrate that it is vital to continue researching the lasting effects of Covid-19 related stress on mental health, as anxiety and depression are associated with suicidal ideation (Primananda & Keliat, 2019), suicide attempts (Seo et al., 2021) and poor academic performance (Awadalla et al., 2020).

Hypothesis 3 & 4

In relation to hypotheses three and four, it is inferred that Covid-19 related stress increases levels of disordered eating and creates a more negative body image among college students. These two constructs are not as well researched in the context of the pandemic (Ahuja & Banerjee, 2021; Ramalho et al., 2021; Swami et al., 2021a), thus contributing immensely to the current state of knowledge, where we see that the Covid-19 related stressors pose a threat to body image and disordered eating. These findings are concordant with emerging research, where evidence shows that the pandemic is associated with an increase in disordered eating (Flaudias et al., 2020; Tabler et al., 2021) and Covid-19 related stress/anxiety is facilitating negative body image outcomes (Swami et al., 2021a; Swami et al., 2021b). In contrast, a previously mentioned study found no significant effect of the pandemic on body image and disordered eating (Baceviciene & Jankauskiene, 2021). It was suggested that the timing of the study may have impacted the results, where the effects of the pandemic on body image and disordered eating may have been latent during data collection. The present study was conducted a year later, which may explain why the findings were significant.

It is no surprise that Covid-19 related stress is impacting college students' body image and disordered eating levels. The pandemic evoked a stressful context for college students, where many factors may have contributed to these findings, such as increased use of Social Networking Sites (SNS) (Rodgers et al., 2020; Swami et al., 2021a). College students' SNS usage significantly increased during the pandemic (Tuck & Thompson, 2021), thus increasing exposure to damaging appearance ideals (Vall-Roqué et al., 2021). Prior research before the pandemic, demonstrated the harmful effects of increased SNS use and exposure to appearance ideals on body image and disordered eating (Fioravanti et al., 2022; Hawkins et al., 2004; Jarman et al., 2021; Saiphoo & Vahedi, 2019; Zhang et al., 2021). According to the Tripartite Influence model, these appearance ideals pose a significant threat to body image and disordered eating through the mediational pathways of internalisation of appearance ideals (adopting appearance ideals internally) and social appearance comparisons (comparing yourself to others)(Thompson et al., 1999). However, the mechanisms through which Covid-19 related stress predicted these outcomes cannot be inferred from the present study. Future research may adopt a qualitative approach to help understand the underlying mechanisms. It is vital to continue research in this area, as these constructs are risk factors for eating disorder onset (Stice et al., 2017; Rohde et al., 2014).

Hypothesis 5

The results from the final research hypotheses were quite important, as females exhibited higher Covid-19 related stress levels. This finding aligns with previous research carried out, despite these studies utilising different measures to capture Covid-19 related stress levels. One study used the Coronavirus Stress Measure (Hu et al., 2021), another one used the Coronavirus anxiety scale and the Obsession with Covid-19 scale (Aslam et al., 2021; Lee, 2020). This

finding showcases that females are more vulnerable to higher levels of Covid-19 related stress, which is likely endangering their mental health. This knowledge may help to inform college institutions that females might need additional support to alleviate their stress.

There are many reasons why females may experience heightened Covid-19 related stress levels. An explanation for this phenomenon stems from a physiological perspective, where females may be more susceptible to stress due to their anatomy, studies have shown that in response to a stressor males utilise stress regulation and cognitive control regions in their brains more than females (Kogler et al., 2017). An alternative explanation is the stressors introduced, female college students found social isolation and transitioning to online learning more difficult (Prowse et al., 2021). Another possible stressor is exposure to domestic violence, as the pandemic caused an upsurge in domestic violence (Piquero et al., 2021). However, this is speculation and future research should address these differences.

Additionally, a significant difference was observed in relation to body image. Females scored significantly lower compared to males, showcasing that females harboured a more negative body image. This result is consistent across studies conducted prior to the pandemic (Kennedy et al., 2004; Perelman et al., 2018; Quittkat et al., 2019). One of the explanations put forward for this difference centres around how females are more exposed to rigid and pervasive norms surrounding the ideal appearance, while also being encouraged more to attain the ideal appearance, which potentially impacts female body image (Buote et al., 2011). These findings show that there is still a significant disparity in body image outcomes and measures should be taken to help reduce this gap.

Another finding concerns individuals who identified as ‘other’, where no differences were found in relation to Covid-19 related stress levels. However, it is anticipated that this

subgroup would exhibit higher levels of Covid-19 related stress, as prior to Covid-19 gender diverse individuals were considered a vulnerable group, exhibiting a higher prevalence of poor mental health (Newcomb et al., 2019; Wang et al., 2020b). Emerging research has shown that gender-diverse students displayed significantly higher levels of psychological distress and poor mental health during the pandemic (Chima et al., 2022; Hunt et al., 2021). It is inferred that gender diverse individuals may have higher Covid-19 related stress levels resulting from unique stressors faced during the pandemic, such as increased exposure to harmful environments where their gender identity is not respected (Hawke et al., 2021). The current study yielded no significant differences potentially due to the lack of gender-diverse representation in the sample. Future research is needed, as to the researcher's knowledge, there are no studies as of yet, assessing the effects of Covid-19 related stress on a gender-diverse Irish student sample.

Strengths and Limitations

It is important to state the limitations and strengths of the present study. Firstly the cross-sectional design is a limitation. This is due to the inability to infer causation from cross-sectional studies (Wang & Cheng, 2020). Future research may adopt a longitudinal design, to help establish causation and understand the long-term effects of Covid-19 related stress. However, it is important to acknowledge the findings from the present study as a strength, as each hypothesis was supported, showcasing consistency with previous research where Covid-19 related stress is linked to aversive outcomes (Zurlo et al., 2022). This gives rise to another strength and possible limitation, where the replication of this study is somewhat impossible, due to the novel context, as following data collection, restrictions in Ireland have significantly reduced. This is important as it provides insight into a particular timeframe of the pandemic, yet further research is unable to replicate the context in which data was collected.

Another limitation is the adapted Covid-19 Student Stress Questionnaire, as there was an issue with question 8, where it asks '*How did you perceive the impact of COVID-19 and restrictions on your body image and eating habits ?*'. This question should have been two separate questions, as it is measuring two distinct constructs. This could have caused confusion for participants, as they may have experienced heightened stress for one construct and not the other. Concerning the CSSQ again, this measure may need to be updated due to the ever-changing state of restrictions in Ireland (Citizens Information, 2022), as this could introduce new stressors for students not outlined in the CSSQ. For example, masks are no longer mandatory to wear, this may cause stress for individuals, possibly resulting from an increased fear of contagion. Future research may identify what new Covid-19 related stressors are affecting college students, to help form new Covid-19 related stress measures. It is important to note that the adapted CSSQ functioned as a strength of the study, yielding significantly higher reliability compared to the original CSSQ (Zurlo et al., 2020), demonstrating that the new questions were successful in capturing student-specific Covid-19 related stress.

Another limitation is that the study solely relied on the use of self-report measures, which may have introduced social desirability bias. Social desirability bias relates to when an individual chooses answers not based on their true thoughts but based on what they deem to be the socially acceptable answer (Holden & Passey, 2009), meaning that the participants' true thoughts and behaviours may not have been provided, ultimately influencing the results. Although the self-report measures may have introduced bias, they are a strength, as each scale exhibited high reliability and good validity, which is vital in establishing good quality research. The measures utilised were also deemed appropriate for the sample, as they were previously tested on college students (Kelly & Stephen, 2016; McLafferty et al., 2021; Prnjak et al., 2020).

Implications

The present study contributes significantly to understanding how the pandemic is impacting college students' lives. The importance of continuing to research the impact that Covid-19 related stress is having on college students within the Irish context is exemplified, as it is linked to poor mental, body image and disordered eating outcomes. There are practical implications for third-level institutions in Ireland, which may take these findings into consideration and recognise the need for action to help reduce the psychological impact of the pandemic. For combatting these aversive outcomes, institutions could employ a number of different strategies tailored to improve the well-being of students. Firstly they may advertise the support services available at the college to a stronger degree, this may consist of the guidance counsellor making students aware of the services available and recommending student support outlets such as 'Niteline'. It may also encourage colleges to implement various prevention programs such as stress management classes, which could help in alleviating some of the Covid-19 related stress experienced by students and help them to cope with and manage stress in case there are future epidemics.

Various campaigns may also be employed, as outlined previously Covid-19 related stress is impacting body image and disordered eating. College institutions could team up with eating disorder support services such as 'Body Whys' and implement a campaign, that encourages body positivity and informs students on the damaging effects of the pandemic, while also educating students on the health risks of eating disorders. This study also shows the differential impact of the pandemic on gender. Third-level institutions may pay closer attention to females and employ support groups, tailored to helping females with their mental health, body image and stress

levels, which is of great importance as females are more predisposed to mental health disorders (Klose & Jacobi, 2004).

Conclusion

The present study's findings showcase that Covid-19 related stress is contributing to mental health, body image and disordered eating outcomes among third-level education students, aligning with prior research and predictions. The findings contribute significantly to the existing knowledge, as the study was conducted in an Irish context. These associations have not been investigated on an Irish student sample previously. The study was also conducted during a period with minimal restrictions, providing insight into the potential long-term effects of the pandemic, as previous research has mainly focused on early critical periods. However, future research using longitudinal research designs is necessary for understanding the long-term ramifications of Covid-19 related stress on college students' psychological outcomes, as this cannot be inferred from the present study. Furthermore, the link between Covid-19 related stress and body image and disordered eating levels is of great importance, as this area was under-researched prior to investigation. Additionally, findings provided a rich insight into which gender has higher Covid-19 related stress levels and poorer body image, demonstrating that females may need extra support resources. It was also identified that further research is necessary to understand the underlying mechanisms through which Covid-19 related stress is impacting psychological health. Researching the mechanistic pathways may help to devise interventions that can help alleviate Covid-19 related stress and the aversive outcomes it contributes to.

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Appendices

Appendix A

Patient Health Questionnaire (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?	NOT AT ALL	SEVERAL DAYS	MORE THAN HALF DAYS	NEARLY EVERY DAY
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the	0	1	2	3

newspaper or watching television				
8. Moving or speaking so slowly that other people could have noticed. Or the opposite being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3

Appendix B

Generalized Anxiety Disorder 7-item (GAD-7) scale

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it's hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
	+	+	+	
Add the score for each column				
Total Score *(add your column scores)* =				

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all _____

Somewhat difficult _____

Very difficult _____

Extremely difficult _____

Appendix C

Eating Disorder Examination Questionnaire-Short (EDE-QS)

EATING DISORDER EXAMINATION QUESTIONNAIRE - SHORT (EDE-QS)

ON HOW MANY OF THE PAST 7 DAYS….	**0 days**	**1-2 days**	**3-5 days**	**6-7 days**
1. Have you been deliberately trying to limit the amount of food you eat to influence your weight or shape (whether or not you have succeeded)?	0	1	2	3
2. Have you gone for long periods of time (e.g., 8 or more waking hours) without eating anything at all in order to influence your weight or shape?	0	1	2	3
3. Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (such as working, following a conversation or reading)?	0	1	2	3

4. Has thinking about your weight or shape made it very difficult to concentrate on things you are interested in (such as working, following a conversation or reading)?	0	1	2	3
5. Have you had a definite fear that you might gain weight?	0	1	2	3
6. Have you had a strong desire to lose weight?	0	1	2	3
7. Have you tried to control your weight or shape by making yourself sick (vomit) or taking laxatives?	0	1	2	3
8. Have you exercised in a driven or compulsive way as a means of controlling your weight, shape or body fat, or to burn off calories?	0	1	2	3
9. Have you had a sense of having lost control over your eating (at the time that you were eating)?	0	1	2	3

10. On how many of these days *(i.e. days on which you had a sense of having lost control over your eating*) did you eat what other people would regard as an <u>unusually large amount of food in one go</u>?	0	1	2	3

OVER THE PAST 7 DAYS …	**Not at all**	**Slightly**	**Moderately**	**Markedly**
11. Has your weight or shape influenced how you think about (judge) yourself as a person?	0	1	2	3
12. How dissatisfied have you been with your weight or shape?	0	1	2	3

Appendix D

Body Image States Scale (BISS)

For each of the items below, check the box beside the one statement that best describes how you feel RIGHT NOW AT THIS VERY MOMENT. Read the items carefully to be sure the statement you choose accurately and honestly describes how you feel right now.

1 Right now I feel…

1. Extremely dissatisfied with my physical appearance
2. Mostly dissatisfied with my physical appearance
3. Moderately dissatisfied with my physical appearance
4. Slightly dissatisfied with my physical appearance
5. Neither dissatisfied nor satisfied with my physical appearance
6. Slightly satisfied with my physical appearance
7. Moderately satisfied with my physical appearance
8. Mostly satisfied with my physical appearance
9. Extremely satisfied with my physical appearance

2 Right now I feel . . .

1. Extremely satisfied with my body size and shape
2. Mostly satisfied with my body size and shape
3. Moderately satisfied with my body size and shape
4. Slightly satisfied with my body size and shape
5. Neither dissatisfied nor satisfied with my body size and shape
6. Slightly dissatisfied with my body size and shape
7. Moderately dissatisfied with my body size and shape

8. Mostly dissatisfied with my body size and shape

9. Extremely dissatisfied with my body size and shape

3 Right now I feel . . .

1. Extremely dissatisfied with my weight

2. Mostly dissatisfied with my weight

3. Moderately dissatisfied with my weight

4. Slightly dissatisfied with my weight

5. Neither dissatisfied nor satisfied with my weight

6. Slightly satisfied with my weight

7. Moderately satisfied with my weight

8. Mostly satisfied with my weight

9. Extremely satisfied with my weight

4 Right now I feel . . .

1. Extremely physically attractive

2. Very physically attractive

3. Moderately physically attractive

4. Slightly physically attractive

5. Neither attractive nor unattractive

6. Slightly physically unattractive

7. Moderately physically unattractive

8. Very physically unattractive

9. Extremely physically unattractive

5 Right now I feel . . .

1. A great deal worse about my looks than I usually feel
2. Much worse about my looks than I usually feel
3. Somewhat worse about my looks than I usually feel
4. Just slightly worse about my looks than I usually feel
5. About the same about my looks as usual
6. Just slightly better about my looks than I usually feel
7. Somewhat better about my looks than I usually feel
8. Much better about my looks than I usually feel
9. A great deal better about my looks than I usually feel

6 Right now I feel that I look . . .

1. A great deal better than the average person looks
2. Much better than the average person looks
3. Somewhat better than the average person looks
4. Just slightly better than the average person looks
5. About the same as the average person looks
6. Just slightly worse than the average person looks
7. Somewhat worse than the average person looks
8. Much worse than the average person looks
9. A great deal worse than the average person looks

Appendix E

Covid-19 Student Stress Questionnaire (CSSQ)

	Not at all stressful	Somewhat stressful	Moderately stressful	Very stressful	Extremely stressful
1. How do you perceive the risk of contagion during this period of the Covid-19 pandemic ?	0	1	2	3	4
2. How do you perceive the condition of social isolation imposed during this period of COVID-19 pandemic?	0	1	2	3	4
3. How do you perceive the relationships with your relatives during this period of COVID-19 pandemic ?	0	1	2	3	4
4. How do you perceive the relationships with your university colleagues during this period of COVID-19 pandemic?	0	1	2	3	4

5. How do you perceive the relationships with your university professors during this period of COVID-19 pandemic ?	0	1	2	3	4
6. How do you perceive your academic studying experience during this period of COVID-19 Pandemic ?	0	1	2	3	4
7. How do you perceive the changes in your sexual life due to the social isolation during this period COVID-19 pandemic?	0	1	2	3	4

Appendix F

Adapted Covid-19 Stress Questionnaire (CSSQ)

	Not at all stressful	Somewhat stressful	Moderately stressful	Very stressful	Extremely stressful
1. How did you perceive the risk of contagion during the period of the Covid-19 pandemic ?	0	1	2	3	4
2. "How did you perceive the condition of social isolation imposed during the period of the COVID-19 pandemic?	0	1	2	3	4
3. How did you perceive the relationships with your relatives during the period of the COVID-19 pandemic ?	0	1	2	3	4
4. How did you perceive the relationships with your university colleagues during the period of the COVID-19 pandemic?	0	1	2	3	4

5. How did you perceive the relationships with your university professors during the period of the COVID-19 pandemic ?	0	1	2	3	4
6. How did you perceive your academic studying experience during the period of the COVID-19 Pandemic ?	0	1	2	3	4
7. How did you perceive the changes in your sexual life due to the social isolation during the period of COVID-19 pandemic?	0	1	2	3	4
8. How did you perceive the impact of COVID-19 and restrictions on your body image and eating habits ?	0	1	2	3	4
9. How did you perceive the impact of COVID-19 and restrictions on your mental health and wellbeing ?	0	1	2	3	4

Appendix G

Information page

Participant Information

You are being invited to participate in a research study, being carried out by an undergraduate college student as part of her final year thesis. Please read the following statements and information before proceeding to the consent page.

What is this study about ?

I am a final year student, currently studying at National college of Ireland and this is my final year project. For my thesis I have decided to investigate the impact of Covid-19 on mental health, body image and disordered eating tendencies of students, to further the current state of knowledge regarding these topics. The project will be supervised by a lecturer at NCI to aid myself and the project.

What will taking part involve ?

If you consent to participate you will answer an online questionnaire about your gender, age and whether you attend a third level institution, other questionnaires in the survey will measure Covid-19-related stress, anxiety, depression levels, body image and disordered eating tendencies. There will be questions relating to mental health, moods, body dissatisfaction, depressive and anxiety symptoms and self-reflection which may cause distress depending on the individual. If you feel that any of these topics could affect you negatively, you are not obliged to take part.

Your information will be used to see if Covid-19 is having an impact on college student's mental health and body image. For information to be used, all questions must be completed.

Who can take part ?

The study aims to recruit participants from the general population and not those from medical or clinical groups. There are specific criteria that you must meet, to be able to answer the following survey. You must attend a third-level institution in Ireland (for example UCD, NCI, DCU). You cannot take part if you do not attend a third-level institution. Another criteria is that you must be over the age of 18, this is to protect individuals who may be under 18, as it would warrant further consent procedures. These requirements are put in place for the safety and welfare of the participants.

Do I have to take part?

Participation in the online survey is completely voluntary. As a participant you have the right to withdraw at any point throughout the survey for any reason. There will be no consequences if you decide to withdraw from the study. You can withdraw up until the point when answers are submitted, after they are submitted, your data will be immediately anonymised and unable to delete or retract.

What are the possible risks and benefits of taking part ?

There are no direct benefits if you wish to take part, however there are potential benefits in carrying out this research, as it will further our knowledge on the topic of Covid-19 by establishing if students' mental health, body image and disordered eating tendencies are suffering as a result of the current pandemic. For example this may affect future supports or interventions. However, there is no guarantee of these benefits.

There may be a potential risk involved in the study relating to distress caused by the questionnaire topics, as some of the questions asked may trigger individuals struggling with mental health or body image issues. It is in your right if you experience distress to stop the

survey. If distress occurs the researcher has provided relevant outlets of support in the debriefing form.

Here are some examples of possibly triggering questions extracted from the questionnaires, participants should be aware that the examples provided are the most potentially distressing questions. A lot of the other questions are not as distressing and easier to answer.

Depression scale :

'Over the last 2 weeks, how often have you been bothered by any of the following problems?

'Thoughts that you would be better off dead or hurting yourself'

Disordered eating scale:

On how many of the past seven days have you tried to control your weight or shape by making yourself sick or taking laxatives ?

Will taking part be confidential and what will happen to my data ?

The information collected from your survey will be anonymised, meaning it will have no connection to your identity. Since the data is being anonymised, data will not be able to be retrieved or amended once the survey is submitted. No one other than the experimenter and supervisor will have access to the information you provide. The data will be treated in the strictest confidence, as all recorded data will be stored on a file that is password protected.

Data will be stored for a maximum of five years in accordance with the college's data retention policy.

What will happen to the results of the study ?

Once the appropriate statistical analyses are carried out on the data, the results will be presented in my final year thesis. This will be submitted to the National College of Ireland. Only

broad trends will be reported in relation to the data you have provided and it will not be possible to identify you. A summary of the results will be available from the experimenter on request once the study is complete.

If you have any queries please contact the researcher or the researcher's supervisor with any questions

Name of experimenter: Lauren Buckley

Experimenter's email: x19418282@student.ncirl.ie

Name of Supervisor: Michelle Kelly

Supervisor's email: Michelle.kelly@ncirl.ie

Appendix H

Consent Form

Thank you for showing an interest in the following study, it is greatly appreciated. It is important to read and understand the information sheet previously shown. It is also imperative to understand that the data you provide in the course of this project will be treated in the strictest confidence and will be used for research purposes only. Furthermore, as a participant in this research study, you will never be identifiable in any of the outputs produced from this survey, for example, reports or research articles, that arise from this project and your data will never be identifiable or viewed by any other party outside the research team.

Before the online questionnaire commences please read the following statements and If you have decided that you would like to take part, please tick the box at the bottom of the screen.

- I understand as the participant that I have the right to withdraw from the study/survey at any point, for any reason.
- I have had opportunities to ask questions and my questions have fully been answered.
- I confirm that I have read and understand the information sheet for the study.
- I understand that my participation is voluntary and that I have free will.
- I have received enough information about the study and what it entails.
- I understand that my data will be kept confidential and anonymized.
- I understand that once my survey is submitted I cannot withdraw my information, as a result of my data being anonymized.
- I understand that the study may involves potential risks and benefits

I understand the nature of this study and my rights regarding it and consent to take part in the following study ☐

Appendix I

Demographic information

Demographic Information

This section is to record relevant demographical information concerning the participant

Please specify your age in years ☐

Please select the gender you identify as

Male ☐

Female ☐

Other ☐

Do you currently attend a third level institution in Ireland(for example DCU, NCI, NUIG, ITT) and if so please tick yes. (In order for your data to be utilised, you must attend a college in Ireland)

Yes ☐

No ☐

Appendix J

Participant Debriefing Information

Sincerest thanks for your participation in the online survey, concerning the impact of Covid-19 on mental health, body image and disordered eating outcomes for third-level education students. The questions asked related to anxiety, depression, body image, disordered eating tendencies and Covid-19-related stress. The data collected, will be used solely for research purposes. After completion of your survey you are reminded that your data is anonymised meaning you are unidentifiable. This also means you cannot withdraw the data.

Thank you again for participating, if there are any questions you can contact the experimenter via email which will be provided below.

In the event that you experienced any form of distress relating to the content of the online survey or your participation in the study. There are number of services' contact details attached below relating to the subject matter of the questionnaires. If these are not suitable, access to guidance counsellors at your institution is also recommended.

Resources available in Ireland, if participant has experienced distress from the survey:

- **Samaritans:** Service that provides emotional support to anyone in distress or struggling to cope.

  Freephone 116 123 every day 24 hours a day
- Mental Health Ireland: Information and support for people who experience mental health difficulties.

  Information line 01 284 1166 from 9am to 5pm Monday to Friday
- **MyMind:** Online counselling service including free appointments for people directly affected by COVID-19.

Contact hq@mymind.org

- **Bodywhys**: A range of services (helpline, support groups, online groups, email and family programmes) for adults and young people with eating disorders, and their families.

  Helpline 01 2107906 Monday, Wednesday and Sunday from 7.30pm to 9.30pm and Saturday from 10.30am to 12.30pm.

  Researcher's Contact Details : X19418282@student.ncirl.ie

Appendix K

Evidence of SPSS dataset and output

thesis data first feb_1.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	age	Numeric	3	0	Please specify ...	None	None	12	Right	Scale	Input
2	gender	Numeric	6	0	Please select t...	{1, Female}...	None	6	Right	Nominal	Input
3	collegeatten...	Numeric	3	0	Do you currentl...	None	None	3	Right	Nominal	Input
4	PHQ1	Numeric	2	0	Little interest or...	{0, Not at all...	None	12	Right	Ordinal	Input
5	PHQ2	Numeric	2	0	Feeling down, d...	{0, Not at all...	None	12	Right	Ordinal	Input
6	PHQ3	Numeric	2	0	Trouble falling o...	{0, Not at all...	None	12	Right	Ordinal	Input
7	PHQ4	Numeric	2	0	Feeling tired or ...	{0, Not at all...	None	12	Right	Ordinal	Input
8	PHQ5	Numeric	2	0	Poor appetite o...	{0, Not at all...	None	12	Right	Ordinal	Input
9	PHQ6	Numeric	2	0	Feeling bad ab...	{0, Not at all...	None	12	Right	Ordinal	Input
10	PHQ7	Numeric	2	0	Trouble concen...	{0, Not at all...	None	12	Right	Ordinal	Input
11	PHQ8	Numeric	2	0	Moving or spea...	{0, Not at all...	None	12	Right	Ordinal	Input
12	PHQ9	Numeric	2	0	Thoughts that y...	{0, Not at all...	None	12	Right	Ordinal	Input
13	GAD1	Numeric	2	0	Feeling nervous...	{0, Not at all...	None	12	Right	Ordinal	Input
14	GAD2	Numeric	2	0	Not being able t...	{0, Not at all...	None	12	Right	Ordinal	Input
15	GAD3	Numeric	2	0	Worrying too m...	{0, Not at all...	None	12	Right	Ordinal	Input
16	GAD4	Numeric	2	0	Trouble relaxing	{0, Not at all...	None	12	Right	Ordinal	Input
17	GAD5	Numeric	2	0	Being so restle...	{0, Not at all...	None	12	Right	Ordinal	Input
18	GAD6	Numeric	2	0	Becoming easil...	{0, Not at all...	None	12	Right	Ordinal	Input
19	GAD7	Numeric	2	0	Feeling afraid a...	{0, Not at all...	None	12	Right	Ordinal	Input
20	EDE1	Numeric	2	0	1.Have you bee...	{0, 0 days}...	None	12	Right	Ordinal	Input
21	EDE2	Numeric	2	0	2.Have you gon...	{0, 0 days}...	None	12	Right	Ordinal	Input
22	EDE3	Numeric	2	0	3.Has thinking ...	{0, 0 days}...	None	12	Right	Ordinal	Input

CLEAN OUTPUT FOR THESIS.spv [Document3] - IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Graphs Utilities Extensions Window Help

- Output
  - Log
  - Reliability
    - Title
    - Notes
    - Scale: reliability
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      - Case Proc
      - Reliability
      - Item-Total
  - Log
  - Reliability
    - Title
    - Notes
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      - Title
      - Case Proc

Depression