Mindfulness: A Protective Factor for the Psychological Effects of the Covid-19 Pandemic

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Abstract

Emerging research has shown that the Covid-19 pandemic is causing substantial increases in anxiety and depression for individuals across the globe. Studies suggest that one critical antecedent of such psychological effects is fear of Covid-19. Identifying protective factors for mental health has been a prominent and key area for research since the coronavirus outbreak. The present study aimed to investigate the role of mindfulness disposition as a protective factor against anxiety and depression symptoms consequent to fear of Covid-19, while also exploring gender differences in levels of mindfulness. A questionnaire measuring fear of Covid-19, anxiety and depressive symptomology and mindfulness was administered to participants (n=310) through various social media platforms. Results indicated that lower levels of fear of Covid-19 were associated with higher levels of mindfulness disposition. Findings from multiple regression analyses indicated that higher levels of fear of Covid-19 predicted higher levels of anxiety and depression, and higher levels of mindfulness disposition predicted lower levels of anxiety and depression. Mindfulness disposition was the strongest predictor of anxiety and depression. T-test results showed that females scored significantly lower than males in levels of mindfulness disposition. This study highlights mindfulness as a potential protective factor for the psychological effects consequent to fear of Covid-19. The major implications of these findings are discussed.

Literature Review

In December 2019, a novel strain of coronavirus broke out in Wuhan, Hubei Province, China, which spread across the world like wildfire (Hossain, Sultana, & Purohit, 2020). In February 2020, the World Health Organisation (WHO) labelled it the 2019 coronavirus disease (Covid-19). As the number of infected cases and the death toll continue to grow rapidly worldwide, Covid-19 has become a major concern for global health. The WHO acknowledged this global crisis and declared Covid-19 as a pandemic in March 2020 (WHO, 2020).

It is well established in the literature that stressful life events can have a consequential impact on an individuals' psychological and physical well-being (DeLongis, Folkman, & Lazarus, 1988), especially events such as large-scale disease pandemics (Hawryluck, 2004; Lancee, Maunder, and Goldbloom, 2008; Maunder et al., 2006; Styra et al., 2008;). Previous pandemics and epidemics, such as the 2003 outbreak of severe acute respiratory syndrome (SARS) triggered grievous psychological consequences among individuals, such as stress, anxiety, depression, and post-traumatic stress disorder (PTSD) (McAlonan, 2007; Nickell et al., 2004). For example, the results of studies that assessed the psychological impact of the SARS outbreak on groups of health care workers in Toronto (Maunder et al., 2006), Hong Kong (Chua et al., 2004), and Singapore (Sim & Chan, 2004), indicated the presence of significant psychiatric symptoms and post-traumatic stress symptoms. The SARS epidemic can be compared to the current pandemic in that it is spreading rapidly, resulting in a high number of mortalities, and causing considerable uncertainty (Rettie, & Daniels, 2020). This, in-turn is causing substantial increases in anxiety and depression for individuals across the globe (Galea, Merchant, & Lurie, 2020; Lei, & Klopack, 2020). Other factors such as grief (Bertuccio, & Runion, 2020),

social isolation (Best, Law, Roach, & Wilbiks, 2020) and fear of contracting the virus (Fitzpatrick, Harris, & Drawve, 2020), have created challenging circumstances for the mental health of many individuals.

Although the psychological impact of the pandemic is having an effect on a global scale, factors such as gender may influence certain outcomes. Studies conducted since the outbreak of the pandemic have found females to be at a higher risk of developing mental health symptoms such as anxiety and depression, compared to males (Matiz et al., 2020; Solomou, & Constantinidou, 2020). This was illustrated in a sample of Republic of Ireland residents (Hyland et al., 2020), Italian residents (Conversano et al., 2020), and Polish (Debowska, Horeczy, Boduszek, & Dolinski, 2020) and Nigerian university students (Rakhmanov, Demir, & Dane, 2020), among others. However, males still show a significant risk in developing mental health disorders (Mehdi et al., 2020). In contrast, a study conducted by Song, et al. (2020) found that male medical staff working and residing in Hubei province, China, were more likely to show significant levels of depression and PTSD consequent to Covid-19 compared to female medical staff. These study discrepancies may be related to the timing of the studies in regards to the severity of Covid-19 (Song et al., 2020), the risk of infection at the time for each of the samples (Fitzpatrick, Harris, & Drawve, 2020), and the significant individual differences in the degree of strategies used to cope with these events (Perrin, McCabe, Everly, & Links, 2009); or it may be the case that across distinct cultures, males and females experience and cope with such stressful life events differently. Research on this topic remains unclear in the context of a pandemic. Hence, it is important to understand gender differences in the degree of strategies used to cope more fully. Greater understanding could inform theory, future research and guide more tailored

prevention or intervention strategies. Greater knowledge could also help us understand protective factors, such as what tends to make males less susceptible to the psychological effects.

Protective Factors

Identifying protective factors for mental health has been a prominent and key area for research since the coronavirus outbreak (Petzold et al., 2020; Sharma, Reina Ortiz, & Sharma, 2020). One study suggested that significant risk factors for psychological distress included fear of contracting the virus and perceiving the virus as a threat (Holingue et al., 2020). In contrast, psychological resilience has been demonstrated as one of the protective factors for psychological distress (Zhang, et al. 2020). Past studies have shown resilience to be inversely related to levels of anxiety and depression (Hjemdal, Vogel, Solem, Hagen, & Stiles, 2011) and directly related to psychological well-being (Sagone, De Caroli, Falanga, & Indiana, 2019) and mindfulness (Keye, & Pidgeon, 2013). With reference to protective factors, these studies support past research that highlighted the benefits of mindfulness in relation to mental health (Hülsheger, Alberts, Feinholdt, & Lang, 2013), including several systematic reviews and meta-analyses that showed significant positive effects on anxiety and depressive symptomology in individuals who received treatment in the form of mindfulness-based interventions (Chu et al., 2018; Chu, & Mak, 2020; Lovas, & Schuman-Olivier, 2018). Moreover, a longitudinal study investigating the effects of mindfulness-based training on the brain, found mindfulness significantly reduced anxiety and depression by fostering alterations in brain plasticity, in-turn refining the neuronal basis of psychological disorders (Yang et al., 2016). Recent literature has identified mindfulness as another potential protective factor during the outbreak of Covid-19 (Bäuerle, 2020). However, the majority of studies recruited mainly female samples from the general population (Conversano et al., 2020), university students (Belen, 2020), and a population of Italian female schoolteachers

(Matiz et al., 2020), leaving little insight into how mindfulness during Covid-19 may or may not be a protective factor for mental health disorders in males.

Mindfulness Disposition

Mindfulness is defined as a state of awareness in which an individual actively pays attention to events and experiences that occur in the present moment, in a non-reactive, open-minded, and non-judgmental way (Jha, Krompinger, & Baime, 2007). Mindfulness as a dispositional characteristic is described as an innate ability of consciousness and self-awareness that take place independently of training (Andrews, 2009). This potential may be more greatly existent in some individuals than others (Slonim, Kienhuis, Di Benedetto, & Reece, 2015). Mindfulness disposition is related to psychological constructs including defence mechanisms, emotional intelligence, vivid perception, and receptive attention (Di Giuseppe, Ciacchini, Piarulli, Nepa, & Conversano, 2019). Individuals who demonstrate high levels of mindfulness disposition are less prone to being affected by psychological distress (Carmody, & Baer, 2008). In contrast, individuals who demonstrate low levels of mindfulness ability tend to illustrate higher levels of depression and anxiety, both of which can result in the rumination of past and present events or experiences (Zhong, Goh, Li, Bao, & Xu, 2020).

As mentioned, mindfulness is considered a state of awareness in which an individual pays focused attention to events and experiences that occur in the present moment in a non-reactive way (Jha, Krompinger, & Baime, 2007). Conversely, worry and fear of Covid-19 is future focused, including fear of contracting the virus (Fitzpatrick, Harris, & Drawve, 2020) and/or losing a loved one to death as a result of the disease (Bertuccio, & Runion, 2020). Thus, mindfulness might mitigate mental health symptoms such as anxiety and depression related to the fear associated with Covid-19. One of the very few, if not only studies to investigate fear of

Covid-19 and mindfulness disposition, used the Fear of Covid-19 Scale, and found fear of Covid-19 to be negatively associated with mindfulness disposition and positively correlated with anxiety and depression (Belen, 2020). However, although this study is supported by numerous other studies showing a relationship between mindfulness and improved mental health outcomes, further research is required in relation to Covid-19 fear specifically, to determine if these results can be replicated. In addition, the sample (n=355) included mostly females (71.5%), and although this representation is important, the study was ungeneralisable to the male population. It is imperative to better understand whether mindfulness disposition in males' buffers against the psychological effects associated with fear of Covid-19. Although males have a lower likelihood of developing mental health symptoms compared to females, they are still at risk; and their experience of mental health symptoms could be exacerbated or lead to poorer outcomes because they tend to be more resistant to talking about their feelings or seeking help for mental health problems compared to females (Thompson et al., 2016). As a result of this, they are at higher risk for suicide (Houle, Mishara, & Chagnon, 2008). Promoting mindfulness in both males and females may therefore provide a promising avenue for developing effective coping strategies during the pandemic. Studies have found how mindfulness in general can reduce mental health symptoms for both genders (Carlson, Ursuliak, Goodey, Angen, & Speca, 2001; Young, & Baime, 2010), and interestingly, men may be more open to mindfulness interventions as opposed to opening-up or seeking help from a doctor about their mental health problems. Overall, mindfulness disposition has shown to be a positive contributor to psychological well-being and a crucial factor during times of crisis, such as an outbreak of a rapidly spreading infectious disease.

The Present Study

Given the novelty of this rapidly spreading virus there is a need for further contribution to the literature that supports and builds upon this novel research, specifically investigating protective factors for the psychological effects of the current pandemic. Most studies during the pandemic have only analysed 'mindfulness-based training' as buffers against the psychological effect's consequent to Covid-19 (Chu et al., 2018; Chu, & Mak, 2020; Lovas, & Schuman-Olivier, 2018). Very few studies have investigated how, depending on the level of 'mindfulness disposition' an individual possesses, mindfulness disposition could potentially act as a buffer against distress experienced as a result of the current pandemic. Therefore, studies that analyse mindfulness disposition, as opposed to mindfulness training, as a potential buffer for psychological distress during the pandemic require further consideration. This research could better inform mindfulness-based interventions particularly for individuals who show lower levels of mindfulness disposition as a characteristic, during the pandemic and beyond. To the best of my knowledge, there is only one previous study that uses the Fear of Covid-19 Scale to specifically investigate the role of mindfulness disposition as a protective factor for anxiety and depression, consequent to fear of Covid-19 (Belan, 2020). Further investigating the associations between mindfulness disposition and these specific variables and shedding more light on the potential significance of mindfulness disposition as a protective factor, is imperative.

In addition, although females have been found to demonstrate higher levels of mental health symptoms during the pandemic compared to men (Conversano et al., 2020; Matiz et al., 2020; Rakhmanov, Demir, & Dane, 2020), males have also shown significant levels of mental health symptoms during this time (Mehdi et al., 2020; Song et al., 2020). Studies have found how mindfulness in general can reduce mental health symptoms for both genders (Carlson,

Ursuliak, Goodey, Angen, & Speca, 2001; Young, & Baime, 2010). However, males have been underrepresented in mindfulness studies during the pandemic (Belan, 2020; Conversano et al., 2020; Matiz et al., 2020), which is a concern, as males are less likely to seek help for mental disorders (Thompson et al., 2016), and are at higher risk of suicide compared to females (Houle, Mishara, & Chagnon, 2008). Previous research has found that even though individuals may be facing the same fears and health risks during the outbreak of a rapidly spreading infectious disease, there are significant individual differences in the degree of strategies used to cope (Perrin, McCabe, Everly, & Links, 2009). Therefore, there is a need for more generalisable research that investigates and compares the effectiveness of mindfulness disposition as a potential mental health buffer, during Covid-19, between males and females. Elucidating male and female levels of mindfulness disposition during the pandemic may reveal whether gender is a protective factor for mental health symptoms consequent to the pandemic. An insight like this could help in the recognition and implementation of effective treatment and interventions appropriate to gender during the pandemic.

There is significant uncertainty as to how long the current pandemic will last. Therefore, investigating and establishing protective factors that buffer against psychological burden consequent to Covid-19, are key research priorities. Doing so is paramount to better inform interventions and mitigate the future onset of psychological morbidity.

The aim of the study is to investigate the role of mindfulness disposition as a protective factor against anxiety and depression symptoms consequent to Covid-19. Specifically, this study will examine the relationship between mindfulness disposition and fear of Covid-19; will examine how well anxiety and depression levels are predicted by fear of Covid-19 and mindfulness disposition; and will examine whether there is a significant difference in

mindfulness disposition levels between males and females. The aims of the current study generate the following research questions and hypotheses:

Research question 1: Is there a relationship between fear of Covid-19 and mindfulness disposition? Hypothesis 1: There will be a relationship between fear of Covid-19 and mindfulness disposition.

Research question 2: How well are anxiety levels predicted by fear of Covid-19 and mindfulness disposition? Hypothesis 2: Anxiety levels will be significantly predicted by fear of Covid-19 and mindfulness disposition.

Research question 3: How well are depression levels predicted by fear of Covid-19 and mindfulness disposition? Hypothesis 3: Depression levels will be significantly predicted by fear of Covid-19 and mindfulness disposition.

Research question 4: Is there a significant difference in mindfulness disposition levels between males and females? Hypothesis 4: There will be a significant difference in mindfulness disposition levels between males and females.

Methods

Participants

The sample for the present study consisted of 310 (Males: *n* = 126; Females: *n* = 173; Other: *n* = 11) participants, with a mean age of 27.89 years (SD = 11.75), ranging from 18-77. Participants were recruited from the general population through convenience sampling, via a link to the study that was shared on the researcher's social media accounts (Instagram, Facebook, WhatsApp). Opportunistic snowball sampling was also used as participants were invited to share the link with other individuals who were eligible to participate in the study. To be eligible, participants were required to be at least 18 years of age and use one of the mentioned social media platforms. A large proportion of the sample (51.9%) were students (*n* = 161), 33.5% were employed (*n* = 104), 7.1% were unemployed (*n* = 22), and 7.4% participants selected other (*n* = 23).

A G*Power: Statistical Power Analyses (Faul, Erdfelder, Buchner, & Lang, 2009) calculator was used to determine the sample size for this study. A priori power analysis was conducted for a standard multiple regression: fixed model, R^2 deviation from zero, (f-tests family). Input parameters for effect size = 0.15, α err prob = 0.05, power (1-β err prob) = 0.95, no. of predictors = 2. This resulted in a total sample size of 107. Next a priori power analysis was conducted for an independent t-tests sample. Input parameters for tails = one, effect size d = 0.5, α err prob = 0.05, power (1-β err prob) = 0.95, allocation ratio N2/N1 = 1. This resulted in sample size for group 1 (males) = 88 and a sample size for group 2 (females) = 88, with a total sample size of 176. As 176 was the highest recommended sample size number of all the statistical tests being conducted, 176 was the minimum sample size required for this study.

Measures

To obtain and measure data for analyses, the study questionnaire was comprised of demographic questions and four established standardised scales. The scales were integrated with the use of Google Docs. The demographic questions regarding gender, age, and occupation, were obtained to achieve a basic profile of the subjects participating in the study.

Fear of COVID-19 Scale (FCV-19S); The FCV-19S consists of a 7-item scale which measures the extent to which a person fears COVID-19. It is scored using a 5-point Likert scale from minimum score 1 = 'strongly disagree' to highest score 5 = 'strongly agree'. An example of an item is as follows: *It makes me uncomfortable to think about Corona*. The scale is scored by adding up the item scores of the respondents to obtain a total score. The maximum possible score is 35 and the minimum is 7. Higher scores represent higher levels of COVID-19 fear. The psychometric properties of the scale are satisfactory with adequate test-retest reliability (r = .72) and internal consistency (α = .82) (Ahorsu et al., 2020). In the current study, the Cronbach alpha coefficient for the Fear of COVID-19 Scale was (α = .88), which indicates a high level of internal consistency for the scale with this specific sample.

Mindfulness Attention Awareness Scale (MAAS); The MAAS consists of a 15-item scale which measures core characteristics of dispositional mindfulness. It is scored using a 6-point Likert scale from 1 = 'almost always' to 6 = 'almost never'. An example of an item is as follows: *I find it difficult to stay focused on what's happening in the present.* The scale is scored by calculating a mean of the 15 items. The maximum possible score is 6 and the minimum is 1. Higher scores represent higher levels of dispositional mindfulness (Brown & Ryan, 2003). The scale reveals strong psychometric properties and good internal consistency with a Cronbach's α of 0.87. Sufficient test-retest reliability (r = .81). and validity have also been reported (Black,

Sussman, Johnson, & Milam, 2012). The Cronbach alpha coefficient for the current sample was (α = .89). This scale had good reliability within the current study.

Generalised Anxiety Disorder Assessment (GAD-7); The GAD-7 is a 7-item scale is used to recognise cases of generalised anxiety disorder along with measuring anxiety symptom severity. It is scored using a Likert scale ranging from 0-3, (0 = not at all' to 3 = 'nearly every day'). An example of an item is as follows: *Feeling afraid as if something awful might happen.* The scale is scored by adding together the scores for the seven items to get a total score. The maximum possible score is 21 and the minimum score is 0. Scores of 5, 10, and 15 are taken as the cut-off points for mild, moderate, and severe anxiety. The scale shows excellent internal consistency (Cronbach α = .92). The scales test-retest reliability is adequate (intraclass correlation = 0.83). The scale has also shown to have sufficient criterion, construct, factorial, and procedural validity (Spitzer, Kroenke, Williams, & Löwe, 2006). In the current sample the Cronbach's alpha coefficient was (α = .91), which indicates a high level of internal consistency with this specific sample.

The Patient Health Questionnaire (PHQ-9); The PHQ-9 scale (Spitzer et al., 1999) consists of a 9-item scale, used to measure the severity of depression and is a useful tool that not only indicates major depression but subthreshold depression in the general population. Each of the 9 items are scored from 0 = 'not at all to 3 = 'nearly every day'. An example of an item is as follows: *Little interest or pleasure in doing things.* The scale is scored by adding up each item to obtain a total score. The maximum possible score is 27 and the minimum is 0. Total scores between 0-14 indicate minimal depression, 15-19 indicate moderate depression, and 20-27 indicate severe depression (Martin, Rief, Klaiberg, & Braehler, 2006). The scale has good psychometric properties with a calculated internal consistency of (Cronbach's alpha) 0.85.

(Maroufizadeh, Omani-Samani, Almasi-Hashiani, Amini, & Sepidarkish, 2019). The Cronbach's alpha coefficient for the current sample was ($\alpha = .90$), this suggests a high level of internal consistency within this specific sample.

Design

The present study was quantitative in nature with a cross-sectional design, focusing on a cross-section of the general population. This approach was chosen as the most appropriate design for achieving the aims of the study. A Spearman's Rank Order correlation coefficient was implemented to investigate the first hypothesis. This examined the association between two continuous variables, fear of Covid-19 and mindfulness disposition. A standard multiple regression was conducted to assess the second and third hypotheses, which examined the associations between anxiety, mindfulness disposition and fear of Covid-19; depression, mindfulness disposition and fear of Covid-19. There were two predictor variables (PVs), for the second and third hypotheses, in both multiple regressions which were as follows: fear of Covid-19 and mindfulness disposition. The criterion variable (CV) for the second hypothesis was anxiety and the CV for the third hypothesis was depression. For the fourth hypothesis, an independent samples t-test was conducted to investigate differences in mindfulness disposition between males and females. The independent variable (IV) for the fourth hypothesis was gender and the dependant variable (DV) was mindfulness disposition. Data were analysed using statistical software SPSS (Social Packages for the Social Sciences). Two-tailed non-directional tests of probability with p values less than .05 were used.

Procedure

Data for the study was obtained through an online anonymous self-report questionnaire. A brief synopsis of the study along with a link to the questionnaire was shared using the

researcher's social media accounts (Instagram, Facebook, WhatsApp). The study link directed participants to the initial page of the questionnaire which contained the participation information sheet (see Appendix A). The information sheet contained the nature and purpose of the study, requirements for eligibility, and what taking part would entail. The information sheet also contained the researchers and supervisors contact details, in the event potential participants wished to pose any questions prior to commencement of the study. Participants were advised to read the information sheet carefully before deciding to complete the questionnaire.

On the next page of the questionnaire, participants were asked to confirm that they were over 18 and that they consented to taking part in the study (see Appendix B). The following page asked for basic demographic information pertaining to age, gender and occupation (see Appendix C). Once consent and demographics had been established, participants were able to proceed to the scales of the questionnaire, which were divided into four sections. Participants completed the Fear of Covid-19 Scale (see Appendix D), the Mindfulness Attention Awareness Scale (see Appendix E), the Generalised Anxiety Disorder Assessment (see Appendix F), and the Patient Health Questionnaire (see Appendix G). Questionnaire completion took approximately 10 minutes. All questions contained in the questionnaire required a mandatory response, however, it was clearly communicated to participants that they were free to withdraw from the study at any stage, without penalty. Participants were debriefed at the end of the questionnaire which contained the researcher's and supervisors contact details along with contact details for several support services in the case that the questions contained in the questionnaire caused distress (see Appendix H). Participants were also invited to share the link with other individuals who may have been interested in participating and who fit the eligibility criteria.

Ethical considerations

This study was approved by the National College of Ireland's Ethics Committee. Data was collected in accordance with the NCI Ethical Guidelines and Procedures for Research involving Human Participants, and the Psychological Society of Ireland Code of Professional Ethics. All participants provided informed consent and confirmed they were over 18. It was clearly stated to participants that their participation was completely voluntary, and they had the right to refuse to participate and withdraw without consequence. Any potential risks in taking part were clearly communicated to participants in the information sheet and they were free and encouraged to discontinue and exit the questionnaire in the event they felt distressed. Contact information for relevant support services were provided in the debriefing section for anyone who felt distressed, and participants were also encouraged to talk to a friend or family member.

Results

Descriptive Statistics

Descriptive statistics for the demographic variables are presented in Table 1. The current data is obtained from a sample of 310 participants, consisting of 55.8% females (n = 173), 40.6% males (n = 126), and 3.5% other (n = 11). A large proportion of the sample (51.9%) were students (n = 161), 33.5% were employed (n = 104), 7.1% were unemployed (n = 22), and 7.4% participants selected other (n = 23).

Table 1

Frequencies for demographic variables (N = 310)

Variable	Frequency	Valid %
Gender		
Male	126	40.6
Female	173	55.8
Other	11	3.5
Employment/Study Status		
Employed	104	33.5
Unemployed	22	7.1
Student	161	51.9
Other	23	7.4

Descriptive statistics for each of the continuous variables are presented in Table 2., which displays the means, medians, standard deviations (SD), and range for the continuous variables. Participants had a mean age of 27.89 years (SD = 11.75), ranging from 18-77. A significant result (Kolmogorov-Smirnov, p<.05) was found for all continuous variables except mindfulness, indicating that the data is non-normally distributed. However, inspection of the histograms showed data to be normally distributed around the mean apart from the histogram for the fear of

Covid-19 variable which was positively skewed. In line with the central limit theorem however, the present sample size is large enough to assume that the sample mean for fear of Covid-19 is sufficiently approximated by a normal distribution, and therefore, the distribution of scores will be treated as normal.

Table 2

Descriptive statistics for continuous variables

	Mean (95% Confidence Intervals)	Std. Error Mean	Median	SD	Range
Age	27.89 (26.57 – 29.20)	.66	24	11.75	18-77
Fear of Covid	14.67 913.98 – 15.36)	.35	13	6.19	7-34
Mindfulness	55.44 (53.68 – 57.20)	.89	55	15.73	17-90
Anxiety	10.44 (9.76 – 11.11)	.34	11	6.05	.00-21
Depression	12.25 (11.45 – 13.06)	.40	12	7.21	.00-27

Inferential Statistics

Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Tests for normality revealed fear of Covid-19 was non-normally distributed (Kolmogorov-Smirnov, $p<.001$). It was therefore necessary to use the Spearman's Rank Order correlation coefficient as the non-parametric alternative to the Pearson's correlation coefficient to investigate the relationship between fear of Covid-19 and mindfulness disposition. There was a small, negative correlation between the two variables ($r = -.20$, $n = 310$, $p < .001$). Results indicate that lower levels of fear of Covid-19 are associated with higher levels of mindfulness disposition.

A standard multiple regression analysis was performed to determine how well anxiety levels could be explained by two predicter variables, fear of Covid-19, and mindfulness disposition. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable (anxiety) included in the study were examined (see Table 3 for full details). Both predictor variables were significantly correlated with the criterion variable, $r = .40$ (fear of Covid-19) and $r = -.54$ (mindfulness disposition). The correlations between the predictor variables were also assessed with r values (see Table 3).

Table 3

Correlations between variables included in the model

Variable	1.	2.	3.
1. Anxiety	-		
2. Fear of Covid-19	.40	-	
3. Mindfulness Disposition	-.54	-.20	-

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

Tests for multicollinearity also indicated that all Tolerance and VIF values were in an acceptable range. These results indicate that there was no violation of the assumption of multicollinearity and that the data was suitable for examination through multiple linear regression analysis. No *a priori* hypotheses had been made to determine the order of entry of the predictor variables, thus a direct method was used for the analysis. Both predictor variables explained 37.7% of variance in anxiety levels ($F (2, 307) = 93.05$, $p < .001$). Both variables were found to uniquely predict anxiety levels to a statistically significant level (see Table 4).

Table 4

Standard multiple regression model predicting anxiety scores

	R^2	B	SE	B	*t*	*P*
Model	.38***					
Fear of Covid-19		0.29	0.04	0.30	6.55	<.001
Mindfulness Disposition		-0.18	0.02	-0.48	-10.41	<.001

Note: R^2 = R-squared; B = unstandardized beta value; SE = Standard errors of B; β = standardized beta value; N = 310; Statistical significance: *$p < .05$; **$p < .01$; ***$p < .001$.

An additional standard multiple regression analysis was performed to determine how well depression levels could be explained by predicter variables, fear of Covid-19, and mindfulness disposition. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable (depression) included in the study were examined (see Table 5). Both predictor variables were significantly correlated with the criterion variable, $r = .38$ (fear of Covid-19) and $r = -.54$ (mindfulness disposition). The correlations between the predictor variables were also assessed with r values (see Table 5).

Table 5

Correlations between variables included in the model

Variable	1.	2.	3.
1. Depression	-		
2. Fear of Covid-19	.38	-	
3. Mindfulness Disposition	-.54	-.20	-

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

Tests for multicollinearity also indicated that all Tolerance and VIF values were in an acceptable range. These results indicate that there was no violation of the assumption of multicollinearity and that the data was suitable for examination through multiple linear regression analysis. No *a priori* hypotheses had been made to determine the order of entry of the predictor variables, thus a direct method was used for the analysis. Both predictor variables explained 36.5% of variance in depression levels (F (2, 307) = 88.35, $p < .001$). Both variables were found to uniquely predict depression levels to a statistically significant level (see Table 6).

Table 6

Standard multiple regression model predicting depression scores

	R^2	B	SE	B	*t*	*P*
Model	.36***					
Fear of Covid-19		0.33	0.05	0.29	6.19	<.001
Mindfulness Disposition		-0.22	0.02	-0.48	-10.30	<.001

Note: R^2 = R-squared; B = unstandardized beta value; SE = Standard errors of B; β = standardized beta value; N = 310; Statistical significance: *$p < .05$; **$p < .01$; ***$p < .001$

Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Tests of normality revealed data for mindfulness disposition were normally distributed (Kolmogorov-Smirnov, p -.202). Therefore, an independent samples t-test was conducted to compare levels of mindfulness disposition (DV) between males and females (IV gender). There was a significant difference in scores, with females (M = 53.74, SD = 15.03) scoring significantly lower than males (M = 58.71, SD =

16.45), $t(297) = 2.71$, $p = .01$, two-tailed. The magnitude of the differences in the means (mean difference = 4.97, 95% CI: 1.37 to 8.58) was small (Cohen's d = .31).

Discussion

Emerging research has shown that the Covid-19 pandemic is causing substantial increases in anxiety and depression for individuals across the globe (Galea, Merchant, & Lurie, 2020; Lei, & Klopack, 2020). Studies suggest that one critical antecedent of such psychological effects is fear of Covid-19 (Fitzpatrick, Harris, & Drawve, 2020; Holingue et al., 2020). Identifying protective factors for mental health has been a prominent and key area for research since the coronavirus outbreak (Petzold et al., 2020; Sharma, Reina Ortiz, & Sharma, 2020). Therefore, the current study aimed to investigate the role of mindfulness disposition as a protective factor against anxiety and depression symptoms consequent to Covid-19. Specifically, the study examined the relationship between mindfulness disposition and fear of Covid-19 and then examined how well anxiety and depression levels were predicted by these two variables. The study also examined whether there was a significant difference in mindfulness disposition levels between males and females.

It was hypothesized that (H1), that there would be a relationship between fear of Covid-19 and mindfulness disposition. Results showed a significant, small, negative correlation between the two variables. These findings indicated that lower levels of fear of Covid-19 were associated with higher levels of mindfulness disposition. The second hypothesis proposed that anxiety levels would be significantly predicted by fear of Covid-19 and mindfulness disposition. Results indicated that the overall two factor model was statistically significant with both predictor variables found to uniquely predict anxiety levels to a statistically significant level. The findings indicated that higher levels of fear of Covid-19 predicted higher levels of anxiety, and higher levels of mindfulness disposition predicted lower levels of anxiety, with mindfulness disposition the strongest predictor of anxiety. A strong negative correlation was found between

mindfulness disposition and anxiety while a moderate positive association was found between fear of Covid-19 and anxiety. The third hypothesis proposed that depression levels would be significantly predicted by fear of Covid-19 and mindfulness disposition. Results showed that the overall model was significant with both variables found to uniquely predict depression levels to a statistically significant level. The findings indicated that higher levels of Covid-19 fear predicted higher levels of depression, and higher levels of mindfulness disposition predicted lower levels of depression, with mindfulness disposition the strongest predictor of depression. A strong negative correlation was found between mindfulness disposition and depression while a moderate positive correlation was found between fear of Covid-19 and depression. Lastly, the fourth hypothesis proposed that there would be a significant difference in mindfulness disposition levels between males and females. Results from the t-test showed that females scored significantly lower than males in levels of mindfulness disposition. All proposed hypotheses of the current study can be accepted based on the above findings.

Additional studies investigating the association between fear of Covid-19 and mindfulness have emerged since the present study was conducted. The correlation analyses within these studies found that lower levels of fear of Covid-19 were associated with higher levels of mindfulness (Majeed, Irshad, Fatima, Khan, & Hassan, 2020; Saricali, Satici, Satici, Gocet-Tekin, & Griffiths, 2020). The present findings are consistent with these emerging findings and support previous research which found a significant negative correlation between the variables (Belen, 2020). Although it could be argued that fear is defined as a primitive response to *present* danger (Hamm, & Weike, 2005), the negative relationship between fear of Covid-19 and mindfulness in the present study reflects the contrast, in which, fear of Covid-19, such as ruminating about potentially contracting the virus, is future focused, whereas

mindfulness is considered a state of awareness in the present moment (Jha, Krompinger, & Baime, 2007). Therefore, individuals who are more prone to worrying and ruminating about catching the virus in the future are less likely to be focused on the present moment. A crucial function of mindfulness is decreasing rumination (Blanke, Schmidt, Riediger, & Brose, 2020), and rumination has shown to be a significant predicter of Covid-19 fear and overall wellbeing since the outbreak of the pandemic (Satici, Saricali, Satici, & Griffiths, 2020). The present and existing findings suggest that mindfulness may be a protective factor against fear of Covid-19 as mindfulness has the potential to mitigate worries and stressors related to the fear associated with the pandemic.

Additionally, the present study found mindfulness to be the strongest predictor of anxiety and depression. These findings are consistent with emerging research which also found mindfulness disposition to be the strongest predictor of anxiety and depression over Covid-19 variables, such as social distancing (Conversano et al., 2020). Interestingly, anxiety and mindfulness standardized beta and effect size scores were identical to depression and mindfulness standardized beta and effect size scores in both regressions within the present study. This might be explained by the typical concurrent and sequential comorbidity between anxiety and depression (Garber, & Weersing, 2010). With anxiety and depression usually accompanying one another, plus an overlap in symptomology (Pollack, 2005), both illnesses might be positively predicted by mindfulness in the exact same way, which means that mindfulness could be used as an overarching treatment method to attenuate both illnesses at the exact same time. An abundance of research prior to Covid-19 have shown mindfulness to be essential and beneficial for mental health in general (Burnett-Zeigler et al., 2018; Donald, Atkins, Parker, Christie, & Ryan, 2016; Huang, He, Wang, & Zhou, 2016; Ireland et al., 2017; Pang, & Ruch, 2019), and

observable across different clinical populations (Idusohan-Moizer, Sawicka, Dendle, & Albany, 2015; Lam, Leung, Lin, & Chien, 2020; Zhang et al., 2015). Hence, it is not surprising that mindfulness is a strong predictor of lower levels of anxiety and depression during the status quo.

Fear of Covid-19 predicted anxiety and depression to a moderate level in the present study, and again, standardized beta and effect scores were almost identical in both regressions. These findings further confirm that the comorbid nature of anxiety and depression potentially means they are affected in the exact same way, however this time negatively in terms of Covid-19 fear. This comorbid relationship undermines the categorical nature of psychological illnesses in the diagnostic and statistical manual of mental disorders (DSM-5) (Regier, Kuhl, & Kupfer, 2013). Depression usually precedes anxiety and is essentially a manifestation of anxiety in its worst form (Fava et al., 2000). Unfortunately, individuals who present with this comorbid relationship are more likely to die by suicide (Pfeiffer, Ganoczy, Ilgen, Zivin, & Valenstein, 2009). Therefore, there is a pressing need to intervene and prevent this cumulative effect of psychological disorders and the fruition of their negative outcomes now and long after the pandemic has subsided. Biomedical interventions need to rely less on the DSM-5 discrete categorizations of anxiety and depression and adequately address and treat what is essentially two different types of the same thing.

Although fear of Covid-19 still predicted anxiety and depression to a moderate degree in the present study, perhaps it was not as strong a predictor as mindfulness due to mindfulness potentially acting as a buffer against increased levels of anxiety and depression consequent to fear of Covid-19. Research suggests that people who are mindful of the present moment are buffered against the adverse consequences of fear of Covid-19, such as developing mental health disorders, as mindfulness counteracts such negative psychological effects. (Majeed, Irshad,

Fatima, Khan, & Hassan, 2020). This study builds upon these findings by further suggesting that mindfulness disposition may play an imperative role in regulating or counteracting fear of Covid-19 and in-turn decreasing anxiety and depression. In a similar study, findings showed that fear of Covid-19 was a strong positive predictor of hopelessness and this predictive relationship was buffered by mindfulness (Saricali, Satici, Satici, Gocet-Tekin, & Griffiths, 2020). This is interesting as hopelessness is the most common symptom of depression (Bener, Alsulaiman, Doodson, & Agathangelou, 2017), which to an extent, further supports the proposition that mindfulness may be a buffer for the relationship between Covid-19 fear and mental health disorders. To get a clearer understanding, future research could implement a causal mediation analysis, such as structural equation modelling (SEM), to establish whether the effect of fear of Covid-19 on both depression and anxiety is mediated by mindfulness.

Another factor to take into consideration is a phenomenon known as *optimistic bias* (OB), which is where individuals underestimate their risk for disease compared to others (Park, Ju, Ohs, & Hinsley, 2021). In the context of the pandemic, individuals who possess an OB may perceive Covid-19 as less threatening, which in-turn, may have less of an effect on their mental health. Hence, OB may be a potential factor in explaining the more moderate predictive relationship between fear of Covid-19 and anxiety and depression in the present study. Another explanation may be that, at the time of the present study, the government had eased Covid-19 restrictions (in Ireland and Britain), and participants residing in these countries may have been more relaxed and less fearful of Covid-19. Previous studies have demonstrated how the severity of Covid-19 (Song et al., 2020), and the risk of infection (Fitzpatrick, Harris, & Drawve, 2020), play a role in the implications for mental health. Future meta-analyses and systematic reviews could compare multiple studies investigating the impact of fear of Covid-19 on mental health

during relaxed and heightened stages of Covid-19 risk, to determine the strength of the predictive relationship between the variables at these different stages.

In terms of gender, previous studies have shown mindfulness to effectively reduce mental health symptoms for both genders (Carlson, Ursuliak, Goodey, Angen, & Speca, 2001; Young, & Baime, 2010). However, studies have found mindfulness to be a stronger predictor of anxiety and depression depending on whether an individual is male or female (Conversano et al., 2020; Soysa, & Wilcomb, 2015). The present study was amongst the first to investigate differences in levels of mindfulness disposition between males and females during the Covid-19 pandemic, which showed females scored significantly lower than males. These findings are not surprising as, although males have shown significant levels of mental health symptoms during the current pandemic (Mehdi et al., 2020; Song et al., 2020), females have demonstrated higher levels of mental health disorders, compared to males during this time (Matiz et al., 2020; Rakhmanov, Demir, & Dane, 2020; Solomou, & Constantinidou, 2020). Thus, the present findings suggest that females presenting with higher levels of psychological disorders during the pandemic may be due to females exhibiting lower levels of mindfulness, as it has shown to be a protective factor for mental health disorders consequent to Covid-19. In support of this proposition, recent findings found female gender to be a risk factor and mindfulness disposition to be a protective factor for anxiety and depression during Covid-19 (Conversano et al., 2020). There are several variables that could explain why males show greater levels of mindfulness disposition compared to females. Firstly, females process emotions and react to them differently compared to males. This was demonstrated in a study where greater Event Related Potentials (ERPs), or electrophysiological brain responses were evoked in women relatively to men in response to unpleasant and high arousing stimuli (Lithari et al., 2010). Domestic abuse has thrived during the

current pandemic, with females as the main victims (Bradbury-Jones, & Isham, 2020). Moreover, the economic downturn consequent to Covid-19 will most likely impact sectors with high female employment shares, coupled with the escalating needs in childcare (Alon, Doepke, Olmstead-Rumsey, & Tertilt, 2020). These factors coupled with females being more reactive to unpleasant and high arousing stimuli, may explain why females were found to be less mindful during Covid-19 compared to males. Another explanation may be a phenomenon called 'flow'. Flow is defined as a state of enthrallment and ordered consciousness, where some individuals demonstrate heightened attention and motivation toward certain activities, despite demands such as hunger or fatigue (Csikszentmihalyi, & Csikszentmihalyi, 1992). Past research found an association between mindfulness and flow state as both variables require the self-regulation of attention and present moment awareness (Moore, 2013). A particular activity that research has found individuals to experience high levels of flow state in is computer gaming (Chou, & Ting, 2003; Scoresby, & Shelton, 2011), which a systematic review demonstrated males engage in more than females (Sublette, & Mullan, 2012). Considering these factors, plus the significant increase in online gaming during the current pandemic (King, Delfabbro, Billieux, & Potenza, 2020), males may currently be more inclined to experience this heightened state of flow, which is positively predicted by mindfulness (Moore, 2013). Hence, a potential explanation as to why the present findings found males to exhibit higher levels of mindfulness than females during the current pandemic. With males exhibiting a greater disposition to mindfulness than females, it can be inferred that male gender is a protective factor for psychological disorders consequent to the pandemic. Future research could investigate why/how males have a greater disposition to mindfulness. Future research should also pay particular attention to the mental health of females during this time and further investigate protective factors for females other than mindfulness.

Implications

Findings within the present study have important theoretical and practical implications. The present study illustrates the importance of establishing protective factors for mental health consequent to Covid-19. The researcher suggests paying accurate attention to mindfulness disposition with the intention of stemming the onset of adverse psychological disorders. New research directions could also investigate additional variables of interest to disassemble the link between fear of Covid-19 and anxiety and depression. Although the pandemic will eventually subside, its impact on mental health will more than likely be long lasting, thus further research to establish protective factors will go a long way in buffering current and long-term adverse psychological outcomes. Mindfulness disposition has the potential to be utilized as an effective form of treatment for psychological disorders, which leaves open the possibility for mental health professionals to utilize mindfulness as part of their practice to stem the current and post-traumatic psychological effects that will potentially manifest in the future. Clinicians could utilize mindfulness for patients at a general level and therapists could utilize mindfulness at an individual level to minimize the adverse psychological effects of Covid-19. Additionally, protocols and techniques used in Cognitive Behavioural Therapy interventions could be specifically tailored and exploited among individuals with chronic anxiety and depression consequent to fear of Covid-19. Moreover, mindfulness could be integrated into work environments. Mangers could hire experts in mindfulness training who could provide online sessions to employees from their homes as it is still not safe or recommended by the government to meet in person due to the high level of Covid-19 cases and deaths. The present study also calls for the implementation of effective and tailored treatment and interventions appropriate to gender during the pandemic and beyond. Particular attention should be paid to females during this

critical time, who, in addition to exhibiting lower levels of mindfulness, are at greater risk of developing psychological disorders.

Findings within the present study could also have implications for policymakers. Policymakers could launch campaigns regarding the relationship between Covid-19 and mental health and make effort to increase public awareness of the benefits of mindfulness as a buffer and an effective coping strategy during the pandemic. Additionally, greater promotion efforts could be made in highlighting the many mindfulness classes and apps available to individuals at a low or free cost. The Minister for Health (Stephen Donnelly, TD) could implement a new policy with the Corporate Legislation, Mental Health, Drugs Policy, and Food Safety Division, highlighting the adverse impact that Covid-19 can have on mental health. The implementation of such policies could minimize the adverse mental health effects of Covid-19, which would not only benefit the public, but the government also, as mental health disorders such as anxiety and depression have a significant financial burden on the Irish state (O'Shea, & Kennelly, 2008). Lastly, mindfulness should be implemented in academic settings. Primary and secondary school unions should advise their members to integrate mindfulness practice into every school curriculum as it will train children from a young age to have a greater disposition to mindfulness and build resilience also. Past studies have shown resilience to be inversely related to levels of anxiety and depression (Hjemdal, Vogel, Solem, Hagen, & Stiles, 2011) and directly related to psychological well-being (Sagone, De Caroli, Falanga, & Indiana, 2019) and mindfulness (Keye, & Pidgeon, 2013). Teaching mindfulness and building resilience from a young age onwards, could buffer against the present psychological effects of fear of Covid-19 and set children up for any potential large-scale stressors in the future.

Strengths and Limitations

Among the strengths of the study is that it further contributes and expands upon novel research and the limited body of knowledge regarding the current pandemic. For over a century, a large-scale disease pandemic has not been experienced to the extent and severity as covid-19 delivered to the globe. Therefore, contributing, and expanding upon novel research examining the current generation is imperative to better inform interventions and mitigate the future onset of psychological morbidity. Taking the novelty of the current pandemic into consideration, the present study is amongst the first to examine the associations between fear of covid-19, mental health, and mindfulness disposition. Additionally, the present study highlights mindfulness disposition as a useful personal resource that can potentially help individuals combat their fear of Covid-19 and decrease mental health disorders consequent to such fear. Another strength of this study is that all scales within the current sample had good psychometric properties, however the present study had several limitations that must be considered.

Firstly, causal relationships between the studied variables could not be inferred due to the cross-sectional design of the study. To progress from this, a longitudinal study might better infer causation and more sufficiently address the research questions posed in the present study. For example, longitudinal research might be more relevant in relation to the psychological effects' consequent to Covid-19 as this study was conducted 7 months into the pandemic, thus, the true effects and impact of Covid-19 on mental health may not be fully apparent in individuals so early on. If longitudinal studies were employed in a study such as the present one, the extent of long-term psychological outcomes could be measured more adequately. Additionally, mixed methods of non-randomized sampling; convenience and snowball sampling, were implemented in recruiting participants, which may have been biased by uncontrolled variables. Furthermore, all

measures in the present study were self-report measures which may have been susceptible to social desirability bias. For example, respondents, either consciously or unconsciously, might have put themselves lower or higher on a scale, depending on the question. Moreover, the participants' self-observation attitude may have been influenced by how they felt at the time of completing the questionnaire, rather than their general feelings in relation to the variables being assessed.

In terms of demographic limitations, a large proportion of the participants were young adults, with a mean age of 27.89 years. This may have been a result of the method of data collection used in the present study. Research data was collected online from social media platforms, which older adults have shown to engage in less frequently than younger adults (Wu, & Chiou, 2020). Moreover, older adults (>60 years) are classified as being the most physically at-risk groups should they contract Covid-19 (Health Service Executive, 2020) thus they may be more fearful of Covid-19, which highlighted by previous research, has consequential implications for their mental health (Gyasi, 2020). Therefore, a more balanced sample including older adults may have yielded different findings. In terms of generalizability, future research should include a sample with a greater number of older adults than those included in the present study, as older adults are potentially impacted by Covid-19 differently from younger adults given they are an 'at risk' group. This could be addressed by facilitating a different method of data collection, such as hardcopy questionnaires.

Lastly, demographic variables for county/country of residence were not obtained from participants within the study, thus there is no data regarding how these demographics may or may not be associated with fear of Covid-19. Fear of Covid-19 variables such as fear of contracting the virus (Holingue et al., 2020), and the fear of losing a loved one to the virus

(Bertuccio, & Runion, 2020), may be higher depending on the severity of the virus and the risk of infection in the county and/or country an individual resides (Fitzpatrick, Harris, & Drawve, 2020), compared to areas with a lower severity and risk of infection. However, this could not be established. Future research should consider obtaining this demographic data as studies will benefit from more generalisable findings.

Conclusion

Overall, the findings of the present study suggested that lower levels of fear of Covid-19 were associated with higher levels of mindfulness disposition, which in-turn results in a decrease in anxiety and depression. Thus, mindfulness might be a protective factor for the psychological effects consequent to fear of Covid-19. Such an insight contributes and expands upon novel research regarding the link between fear of Covid-19 and mental health issues and highlights the importance of establishing protective factors for mental health during such a critical time. While this study attempted to expand upon novel research, future research might benefit from investigating additional variables of interest to disassemble the link between fear of Covid-19 and anxiety and depression. Additionally, longitudinal research could progress from this study by investigating the extent of long-term psychological outcomes and the role of mindfulness as a protective factor as causation could not be inferred in the present study. Notwithstanding this limitation, the present study has important implications. Mindfulness disposition has the potential to be utilized as an effective form of treatment for psychological disorders, which mental health professionals could utilize as part of their practice to stem the current and post-traumatic psychological effects that will potentially manifest in the future. The present study also calls for the implementation of effective and tailored treatment and interventions appropriate to gender during the pandemic and beyond, with particular attention paid to females, who are at

greater risk of developing psychological disorders during this time. It is time to shift focus from problems to solutions and policies aimed at increasing public awareness of the benefits of mindfulness as a buffer, could minimize the adverse mental health effects of fear of Covid-19. Fortunately, mindfulness is a free cost, easily accessible personal resource that can be implemented by individuals to diminish the adverse psychological effects associated with such a large-scale stressor.

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Appendices

Appendix A

Participant Information Sheet

Title of Study: "Mindfulness: A Protective Factor For the Psychological Effects of the Covid-19 Pandemic"

You are being invited to take part in a research study conducted by Leah Harvey. Before deciding whether to take part, please take the time to read this document, which explains why the research is being done and what it would involve for you. If you have any questions about the information provided, please do not hesitate to contact me using the details at the end of this sheet.

What is this study about?

I am a final year student in the BA in Psychology programme at National College of Ireland. As part of our degree, we must carry out an independent research project. For my project, I have decided to investigate the role of mindfulness disposition as a protective factor for the psychological effects, consequent to the current pandemic. I am doing this study as recognising and shedding light on potential protective factors such as mindfulness during the outbreak of such an acute large-scale stressor is imperative. The study will investigate associations between several variables including fear of Covid-19, depression and anxiety, mindfulness, and gender. This project is supervised by Dr Michelle Kelly.

What will taking part in the study involve?

If you decide to take part in this research, you will first be asked to provide consent. You will then be asked to indicate your gender, age and occupation and complete an anonymous online questionnaire on topics in relation to fear of Covid-19, anxiety and depressive symptomology and mindfulness. All questions contained in the questionnaire, will require a mandatory response. You will not be able to proceed from one page of the questionnaire to the next until all questions are responded to. Participation, from start to finish, should take a maximum of 10 minutes, however, there is no time limit so participants will be able to take as much time as needed to fill out the questionnaire.

Who can take part?

The general population from the age of 18+ years will be included in the study. All participants in the appropriate age bracket can take part in the study if they have access to at least one social media platform (Instagram, Facebook, WhatsApp).

Do I have to take part?

Participation in the research is completely voluntary. You have the right to refuse to participate and withdraw without consequence, at any point during the study, and without having to give a reason. Withdrawing from the study will not affect you in any way. However, if you do decide to take part, it will not be possible to withdraw your data from the study once you have submitted the questionnaire, as the questionnaire will be anonymous, and it will not be possible to identify your individual responses. If you do decide to end your participation but change your mind

before the deadline of the questionnaire, you will be able to opt back in or re-contact at any point during that time frame. Whatever decisions you make will be entirely yours and respected.

What are the possible risks and benefits of taking part?

There are no direct benefits to you for taking part in this research. However, the information gathered may contribute to research that helps in identifying protective factors that can be applied in buffering against the psychological effects of Covid-19. There is a small risk that some of the questions contained within this questionnaire may cause minor distress or negative self-evaluation for some participants if the questions cause them to reflect on difficult experiences. An example of a question from the questionnaire that may cause distress is "over the last two weeks, how often have you been bothered by thoughts that you would be better off dead, or of hurting yourself in some way?". If you experience any distress, you are free to discontinue participation and exit the questionnaire. Contact information for relevant support services are provided at the end of the questionnaire. Additional contact information for the NCI Ethics Committee is also provided below should you have any questions regarding your rights as a research subject.

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

Data for the study will be collected using an anonymous online questionnaire. Although the measures of anxiety and depression contained in this questionnaire are clinical measures and often used with clinical populations, data is not being used for diagnostic purposes. To ensure that the identity of participants is protected, all responses to the questionnaires will be stored securely in an encrypted file on the researcher's computer. Only the researcher and their academic supervisor will have access to this information. Participant's data will be retained for 5 years in accordance with the NCI data retention policy.

What will happen to the results of the study?

The results of this study will be presented in my final dissertation, which will be submitted to National College of Ireland. The results of the study may also be presented at conferences and/or submitted to an academic journal for publication.

Who should you contact for further information?

Leah Harvey

Researcher

Email: x18106552@student.ncirl.ie

Dr Michelle Kelly

Academic Supervisor

Email: Michelle.Kelly@ncirl.ie

Phone: (01) 4498787

NCI Ethics Committee

Chair of NCI Ethics Committee

Email: rebecca.maguire@ncirl.ie

Phone: (01) 449 8600

Appendix B

Informed Consent

In agreeing to participate in this research I understand the following:

This research is being conducted by Leah Harvey, an undergraduate student at the School of Business, National College of Ireland.

The method proposed for this research project has been approved in principle by the Departmental Ethics Committee, which means that the Committee does not have concerns about the procedure itself as detailed by the student. It is, however, the above-named student's responsibility to adhere to ethical guidelines in their dealings with participants and the collection and handling of data.

If I have any concerns about participation, I understand that I may refuse to participate or withdraw at any stage (other than after answers have been submitted).

I have been informed as to the general nature of the study and agree voluntarily to participate.

There are no known expected discomforts or risks associated with participation.

All data from the study will be treated confidentially. The data from all participants will be compiled, analysed, and submitted in a report to the Psychology Department in the School of Business. No participant's data will be identified by name at any stage of the data analysis or in the final report.

At the conclusion of my participation, any questions or concerns I have will be fully addressed. I may withdraw from this study at any time by not submitting my answers, however due to data anonymity I will be unable to withdraw after final submission of survey answers as my data will be unidentifiable.

☐ I confirm that I am over 18 years of age

By clicking the 'Start' button below, you are consenting to voluntarily participate in this study, as it is described in the participant information sheet. If you have not already read this document, we recommend you do that now. Thank you for your time.

[Start button]

Appendix C

Demographics

Age

_____

Gender

Male ☐

Female ☐

Other _____

Occupation

Employed ☐

Unemployed ☐

Student ☐

Other_____

Appendix D

Scales in questionnaire

Fear of COVID-19 Scale (FCV-19S)

Please respond to each item by ticking (√) one of the five (5) responses that reflects how you feel, think or act toward COVID-19.

Fear of COVID-19 Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I am most afraid of Corona					
2. It makes me uncomfortable to think about Corona					
3. My hands become clammy when I think about Corona					
4. I am afraid of losing my life because of Corona					
5. When I watch news and stories about Corona on social media, I become nervous or anxious					
6. I cannot sleep because I'm worrying about getting Corona.					
7. My heart races or palpitates when I think about getting Corona.					

Appendix E

Mindful Attention Awareness Scale (MAAS)

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1 = Almost Always

2 = Very Frequently

3 = Somewhat frequently

4 = Somewhat Infrequently

5 = Very infrequently

6 = Almost Never

I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	1	2	3	4	5	6

I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6
I drive places on "automatic pilot" and then wonder why I went there.	1	2	3	4	5	6
I find myself preoccupied with the future or the past.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I'm eating.	1	2	3	4	5	6

Appendix F

Generalized Anxiety Disorder Anxiety Scale (GAD-7)

Over the last 2 weeks, how often have you been bothered by the following problems? (Use "✔" to indicate your answer")	Not at all	Several days	More than 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 is 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

Appendix G

The Patient Health Questionnaire (PHQ-9)

Over the last two weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly everyday
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 newspaper or watching television?	**0**	**1**	**2**	**3**
8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety 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 in some way?	**0**	**1**	**2**	**3**

Appendix H
Debriefing procedures (Survey last page)
I would like to sincerely thank you for taking the time to participate in my study. If you felt any distress as a result of taking part in this study, you are encouraged to speak to someone such as a friend or family member. Contact details for support services have also been provided below should you acquire additional support. Thank you!

Support Services
Samaritans Ireland
Crisis Support
Web link: https://www.samaritans.org/ireland/samaritans-ireland/
Email – jo@samaritans.org.
Freephone: 116 123

Mental Health Ireland
Mental wellbeing information
Web link: https://www.mentalhealthireland.ie/
Email: info@mentalhealthireland.ie
Phone: (01) 284 1166

GROW
Mental wellbeing support and education
Web link: https://grow.ie/about-grow/
Email: info@grow.ie
Phone: 1890 474 474

Contact Information
If you have any concerns or questions on the use of this data, or if you have any further questions about this study, please feel free to contact myself, Leah Harvey, email: x18106552@student.ncirl.ie or the supervisor of this research Dr Michelle Kelly at michelle.kelly@ncirl.ie

Appendix I

Evidence of SPSS data file and output

SPSS DATA FOR ANALYSIS.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	8	0		None	None	12	Right	Scale	Input
2	Gender	Numeric	8	0		{0, Male}...	None	11	Right	Nominal	Input
3	Employmen...	Numeric	8	0	Employment/st...	{0, Employe...	None	29	Right	Nominal	Input
4	COVIDQ1	Numeric	1	0	I am most afrai...	{1, Strongly ...	None	12	Right	Scale	Input
5	COVIDQ2	Numeric	1	0	It makes me un...	{1, Strongly ...	None	12	Right	Scale	Input
6	COVIDQ3	Numeric	1	0	My hands beco...	{1, Strongly ...	None	12	Right	Scale	Input
7	COVIDQ4	Numeric	1	0	I am afraid of lo...	{1, Strongly ...	None	12	Right	Scale	Input
8	COVIDQ5	Numeric	1	0	When I watch n...	{1, Strongly ...	None	12	Right	Scale	Input
9	COVIDQ6	Numeric	1	0	I cannot sleep ...	{1, Strongly ...	None	12	Right	Scale	Input
10	COVIDQ7	Numeric	1	0	My heart races ...	{1, Strongly ...	None	12	Right	Scale	Input
11	Mindfulness...	Numeric	1	0	I could be expe...	{1, Almost ...	None	12	Right	Scale	Input
12	Mindfulness...	Numeric	1	0	I break or spill t...	{1, Almost ...	None	12	Right	Scale	Input
13	Mindfulness...	Numeric	1	0	I find it difficult t...	{1, Almost ...	None	12	Right	Scale	Input
14	Mindfulness...	Numeric	1	0	I tend to walk q...	{1, Almost ...	None	12	Right	Scale	Input
15	Mindfulness...	Numeric	1	0	I tend not to not...	{1, Almost ...	None	12	Right	Scale	Input
16	Mindfulness...	Numeric	1	0	I forget a perso...	{1, Almost ...	None	12	Right	Scale	Input
17	MindfulnessQ7	Numeric	1	0	It seems I am "...	{1, Almost ...	None	12	Right	Scale	Input
18	Mindfulness...	Numeric	1	0	I rush through a...	{1, Almost ...	None	12	Right	Scale	Input
19	Mindfulness...	Numeric	1	0	I get so focuse...	{1, Almost ...	None	12	Right	Scale	Input
20	Mindfulness...	Numeric	1	0	I do jobs or tas...	{1, Almost ...	None	12	Right	Scale	Input
21	Mindfulness...	Numeric	1	0	I find myself list...	{1, Almost ...	None	12	Right	Scale	Input
22	Mindfulness...	Numeric	1	0	I drive places o...	{1, Almost ...	None	12	Right	Scale	Input
23	Mindfulness...	Numeric	1	0	I find myself pre...	{1, Almost ...	None	12	Right	Scale	Input
24	Mindfulness...	Numeric	1	0	I find myself doi...	{1, Almost ...	None	12	Right	Scale	Input
25	Mindfulness...	Numeric	1	0	I snack without ...	{1, Almost ...	None	12	Right	Scale	Input
26	GADQ1	Numeric	1	0	Feeling nervous...	{0, Not at all...	None	12	Right	Scale	Input
27	GADQ2	Numeric	1	0	Not being able t...	{0, Not at all...	None	12	Right	Scale	Input
28	GADQ3	Numeric	1	0	Worrying too m...	{0, Not at all...	None	12	Right	Scale	Input
29	GADQ4	Numeric	1	0	Trouble relaxing	{0, Not at all...	None	12	Right	Scale	Input
30	GADQ5	Numeric	1	0	Being so restle...	{0, Not at all...	None	12	Right	Scale	Input
31	GADQ6	Numeric	1	0	Becoming easil...	{0, Not at all...	None	12	Right	Scale	Input
32	GADQ7	Numeric	1	0	Feeling afraid a...	{0, Not at all...	None	12	Right	Scale	Input
33	PHQ1	Numeric	1	0	Little interest or...	{0, Not at all...	None	12	Right	Scale	Input
34	PHQ2	Numeric	1	0	Feeling down, d...	{0, Not at all...	None	12	Right	Scale	Input
35	PHQ3	Numeric	1	0	Trouble falling o...	{0, Not at all...	None	12	Right	Scale	Input
36	PHQ4	Numeric	1	0	Feeling tired or ...	{0, Not at all...	None	12	Right	Scale	Input
37	PHQ5	Numeric	1	0	Poor appetite o...	{0, Not at all...	None	12	Right	Scale	Input
38	PHQ6	Numeric	1	0	Feeling bad ab...	{0, Not at all...	None	12	Right	Scale	Input
39	PHQ7	Numeric	1	0	Trouble concen...	{0, Not at all...	None	12	Right	Scale	Input

Data View | Variable View