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Abstract

Objectives: The current pandemic wave of COVID-19 has resulted in significant uncertainty for the general public. Mental health and examining factors that may influence distress have been outlined as key research priorities in order to inform interventions. This research sought to examine whether intolerance of uncertainty and coping responses influence the degree of distress experienced by the UK general public during the COVID-19 pandemic.

Methods: Utilising a cross-sectional online questionnaire design, participants were recruited (N= 842) using snowball sampling over a 10-day period in the early 'lockdown' phase of the pandemic.

Findings: Around a quarter of participants demonstrated significantly elevated anxiety and depression, with 14.8% reaching clinical cut-off for health anxiety. A one-way MANOVA indicated those in 'vulnerable' groups were significantly more anxious (p< .001), and also more anxious in relation to their health (p< .001). Mediation modelling demonstrated maladaptive coping responses partially mediated the predictive relationship between intolerance of uncertainty and psychological distress.

Conclusions: Mental health difficulties have become significantly raised during the first wave of the COVID-19 pandemic in the UK, particularly for the vulnerable. Findings support emerging research suggesting the general public are struggling with uncertainty, more so than normal. Vulnerable groups are more anxious about their health, but not more intolerant of uncertainty than the non-vulnerable. Finally, this study indicated two modifiable factors that could act as treatment targets when adapting interventions for mental health during the COVID-19 global health crisis.

Keywords: COVID-19, intolerance of uncertainty, coping responses, mental health, physical health

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Public Significance Statement: This study reflects increased mental health difficulties within the UK during the current wave of the COVID-19 pandemic. Individuals' ability to tolerate uncertainty was predictive of mental health difficulties, and this was mediated by their coping responses. Future treatments could focus on supporting the general public to develop effective coping strategies and tolerate the uncertainty of the current climate, equipping them for potential future pandemic waves.

Introduction

COVID-19 is an infectious disease that was first detected in Wuhan, China in December 2019. Since then, the novel COVID-19 strain of coronavirus has spread worldwide, and was declared a 'public health emergency of international concern' in January 2020 (World Health Organisation, 2020a). The virus is contracted through an infected person coughing or sneezing, and will cause mild to moderate symptoms in most individuals infected. Symptoms include a fever, tiredness and a persistent dry cough (National Health Service, 2020a). However for some individuals, particularly those in vulnerable groups, symptoms can be more severe, and may result in hospitalization and/or death (World Health Organization, 2020a). There is currently no cure or vaccine for COVID-19.

At the time of recruitment (17th April 2020), there were 2.12 million cases globally of COVID-19, and 147,364 deaths recorded (World Health Organisation, 2020b). The number of confirmed cases within the United Kingdom stood at 103,093 (Department of Health and Social Care, 2020), and during ~~time of~~ recruitment ~~t~~, ~~t~~he United Kingdom was in early "lockdown". This required individuals to stay at home, except for very limited purposes (e.g. essential key work, food shop, exercise; Cabinet Office, 2020).

The socioeconomic impact of COVID-19 is uncertain, however it is likely to be profound and long lasting. Whilst it is not completely clear what effects the pandemic and lockdown will have on the mental health of the general population (Xiang et al., 2020), previous research exploring the psychological impact of previous pandemics (e.g. severe acute respiratory syndrome; SARS) found that 35% of individuals recovering from SARS reported moderate to severe levels of depression and/or anxiety (Cheng et al., 2004), and during the H1N1 pandemic 30% of children and 25% of quarantined adults reported symptoms of post-traumatic stress disorder (Sprang & Silman, 2013). A recently published rapid review summarizes these concerns, stating that quarantine can have a negative, potentially long-lasting impact on psychological health, and that this can be amplified by stressors both within and after quarantine (e.g. duration of quarantine, lack of information, financial loss; Brooks et al., 2020).

Emerging reports suggest that due to the scale of the current pandemic, the impact is likely to be considerably larger, surpassing the effect of previous infectious disease outbreaks such as the SARS (Wilder-Smith et al., 2020). This gives some indication that for those who are unduly challenged by the uncertain time frame of restricted movement, reduced social contact for extended periods, and illness of self or close others, the psychological effects are likely to be very pronounced. This is supported by an initial survey of the UK population, which indicated that many individuals had widespread concerns about the impact the pandemic will have on their psychological health, more so than physical health concerns (Holmes et al., 2020).

Numerous articles have been written emphasizing the importance of considering the psychological impact of pandemics on the general population (e.g. Sim & Chua, 2004), and expert panels have stated that monitoring of mental health difficulties and examining psychological factors that may influence levels of distress are key research

priorities during this time (Holmes et al., 2020). Recent data from China reflects 25% of the general population experienced some level of psychological distress during the first wave of COVID-19 (Qiu et al., 2020). This level of distress seems to remain stable throughout different phases of the pandemic, with Wang et al. (2020) noting no significant difference between rates of stress, anxiety and depression during the initial phase of COVID-19 in comparison to the peak in China four weeks later. Therefore any increased psychological distress within the UK population could be long-standing, and is likely to have much wider socioeconomic impacts than anticipated (e.g. increased demand on mental health services). In addition, there has been limited research published exploring directly modifiable factors that influence distress, and it is therefore imperative to determine what factors exist that can be targeted in the treatment of any arising mental health difficulties.

The COVID-19 pandemic has resulted in a high degree of uncertainty worldwide; international responses have varied, rates of infection have been heterogeneous, but all agree that this pandemic is unprecedented. It is likely that some individuals will find this uncertainty difficult to tolerate. 'Intolerance of uncertainty' (IU) is a psychological concept most notably examined as a key maintaining factor within generalized anxiety disorder. However, with more recent research suggesting IU is a concept found across many emotional disorders (e.g. Carleton et al., 2012; Carleton et al., 2014; Fergus & Bardeen, 2013; Holaway et al., 2006), transdiagnostic models of IU have been established (Einstein, 2014; Freeston et al., 2020).

IU refers to an individual's negative emotions, cognitions and behaviours (e.g. coping behaviours) when experiencing uncertainty (Birrell et al., 2011); this could include day-to-day things such as wondering if the bus will arrive on time, to awaiting

the outcome of an interview, the uncertain nature of an early stage relationship or presently, the not knowing when the threat of COVID-19 will remit.

Models of IU suggest that an individual's ability to tolerate uncertainty will likely influence the way they respond and cope with a situation (Einstein et al., 2014). Coping strategies are an individual's efforts to manage their distress, although they are not always effective at doing so. Particular coping strategies (e.g. acceptance, seeking support) are associated with greater psychological health than other, more maladaptive strategies (e.g. self-blame, denial; Hagan et al., 2017; Meyer, 2001).

While both concepts appear to bear saliency in the current climate of COVID-19, IU, coping responses and their relationship to psychological distress have not yet been explored during the current pandemic. Understanding what strategies individuals use to cope with the uncertainty of COVID-19 will provide a picture of how the UK population is coping with the current situation, and may inform future treatments.

Research exploring IU and coping within the H1N1 pandemic in Canada found that greater IU predicted higher levels of H1N1-specific anxiety in participants (Taha et al., 2014) but this relationship was mediated by the coping strategies used, with individuals with high IU being more likely to use emotion-focused coping (e.g. self-blame and rumination). Due to the proposed transdiagnostic nature of IU, further research is needed to explore whether IU and coping responses play a role in a range of mental health difficulties during a pandemic. In addition, there was no enforced lockdown in Canada for the general population during the H1N1 pandemic so generalizability is limited, and it is unclear what the psychological impact of the current, more restrictive containment measures for COVID-19 will be.

The proliferation of COVID-19 may also present a special case for individuals with underlying health conditions. In the UK, the government outlined groups that are

likely to be more vulnerable to experiencing the severe symptoms of COVID-19; this included individuals with chronic respiratory diseases, those on immunosuppressive medication and those above the age of 70 (National Health Service, 2020b). Of all the COVID-19 deaths that occurred in England and Wales during March and April 2020, 90.4% of individuals had a pre-existing health condition (Office for National Statistics, 2020). Previous research into IU in health conditions is sparse, however it could be argued that for these individuals, the increased uncertainty and more pronounced health threat will be particularly difficult to manage.

Thus, this study seeks to address knowledge gaps that may positively benefit understanding of mental health difficulties during the COVID-19 pandemic. Understanding the contribution of these key factors may clarify why some individuals are more likely to experience unmanageable distress, further serving to inform development of pandemic-related psychological treatments and resources for the present COVID-19 wave and future pandemics.

Aims and Objectives

This study seeks to investigate whether mental health difficulties during COVID-19 (specifically depression, anxiety and health anxiety) can be predicted by intolerance of uncertainty, and determine whether coping responses mediate this relationship. Individuals categorized in 'vulnerable groups' will be compared to the rest of the sample, to determine whether the increased threat these groups experience has an impact on their ability to tolerate uncertainty, their coping, and their psychological health. Finally, general population means from previous studies will be compared with the current data, to establish whether there is an increase in mental health difficulties during this time and the precise nature of these difficulties.

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Method

Ethical Approval

Ethical approval for the project was obtained from the University of Bath ethics committee (PREC reference number 20-094).

Design and Procedure

A prospective cross-sectional online questionnaire design was used to examine relevant study factors. A battery of standardized self-report questionnaires was distributed widely through social media channels over a brief sampling period. Individuals meeting inclusion criteria (i.e. adults above 18 living in the UK) participated by independently clicking through the study link. After reading the information sheet and providing consent, individuals completed a number of questionnaires. Debriefing information was provided following study completion.

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Participants

Adults above age 18 who lived in the UK were invited to participate in the online study. Snowball sampling was used to maximize recruitment during the lockdown period, through both social media (Facebook and Twitter) and email distribution lists. The recruitment window was open from 17th April 2020 and 26th April 2020. Recruitment ceased quickly as the recruitment target was surpassed, and this provided a useful 'snapshot' of the status quo of mental health during lockdown.

Of the 974 who participated in the survey, 842 of these were completed fully (86%). The incomplete surveys (n=132) were excluded from any further analysis as chi-square analyses determined there was no significant differences between the demographics of these individuals, and those who fully completed the study (p<.001). This indicates that list-wise deletion is appropriate (Cheema, 2014; Jakobsen et al., 2017). In addition to self-report measures (see following section), participants were asked to complete a demographics questionnaire, and the information collected for

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these 842 participants is found in Table 1. The distribution of participants across UK regions can be found in the supplementary materials.

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[INSERT TABLE 1]

The mean age of participants was 38.06 (*SD* = 14.69) and 10.9% of individuals currently lived alone. Of the 71.3% of people who were still working, 37.7% had face-to-face contact with the general public.

Sixty-three (8%) individuals thought that they had already had COVID-19, and four of these had received a formal diagnosis. Twenty percent (*n* = 165) of individuals reported a close friend or family had been diagnosed with COVID-19.

Twenty two percent (*n* = 182) of individuals self-reported a pre-existing mental health condition, which accurately reflects National Statistics (i.e. one in four; McManus et al., 2009). This included a range of mental health difficulties, but was primarily anxiety (25.7%), depression (25.1%) or mixed anxiety and depression (28.1%).

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Overall, 22.7% of individuals reported being in a 'vulnerable' group. The distribution of the vulnerable groups is outlined in Table 2.

[INSERT TABLE 2]

Measures

IU was measured using the 'Intolerance of Uncertainty Scale' (Freeston et al., 1994). This standardized 27-item scale uses a Likert scale of 1-5, and has excellent internal consistency (α=.94) and good test-retest reliability (*r*=.74; Buhr & Dugas, 2002). In the current sample, internal consistency was excellent (α=.95).

The PHQ-8 and GAD-7 measured depression and anxiety. PHQ-8 is a variation of the original PHQ-9 with Q9 ("thoughts that you would be better off dead or of hurting yourself in some way") removed (Kroenke et al., 2001). The PHQ-8 is used widely in research where due to self-report it is not always possible to respond immediately to an

affirmative, positive response to Q9 (Kroenke & Spitzer, 2002). The PHQ-8 has similar operating characteristics to the PHQ-9 (Kroenke & Spitzer, 2002; Wu et al., 2019), which has good internal reliability (α = 0.89) and test-retest reliability (r = 0.84). In the current sample, internal consistency was good (α= .88). Similarly, the GAD-7 measure has shown excellent internal (α = .92) and test-retest reliability (*r* = .83) in a clinical sample (Spitzer et al., 2006). In the current sample, internal consistency was excellent (α= .90). Clinical cut-off scores are 10 and above for both the GAD-7 (Löwe et al., 2008), and PHQ-8 (Wu et al., 2019).

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The Short Health Anxiety Inventory is a standardized 14-item measure used to assess levels of health anxiety, and uses a clinical cut-off score of 18 or above (Salkovskis et al., 2002). This measure is based on the cognitive-behavioural model of health anxiety, and has shown good internal consistency (α = .86) and good convergent and divergent validity in a non-clinical sample (Abramowitz et al., 2007). In the current sample, internal consistency was excellent (α= .91).

To assess the coping strategies that individuals use during COVID-19, the brief COPE was administered (Carver, 1997). This 28-item measure assesses 14 different coping responses during a particular situation, scored on a Likert scale of 1-4. All 14 coping dimensions have been shown to have good or excellent internal consistency (Ω = 0.71 – 0.98; Monzani et al., 2015). The scale has been used in other disaster affected populations (Carver, 1997), and patients with health crises (Eisenberg et al., 2012). Previous literature has grouped the 14 subscales into 'adaptive' strategies (planning, seeking emotional support, positive reframing, active coping, acceptance, seeking informational support, humor, religion), and 'maladaptive' strategies (denial, self-blame, substance use, venting, behavioural disengagement, self-distraction) for analysis (e.g. Mahmoud et al., 2012), and these subscales will be adopted in the current research. In

the current sample, internal consistency for the adaptive subscale was good (α= .83), and acceptable for the maladaptive subscale (α= .72).

Planned Analysis

Data analysis was completed using Statistical Package for Social Sciences (SPSS) V25. Pearson's correlations examined the magnitude and direction of relationships between the main study variables, and due to multiple comparisons a more stringent significance value (p<.001) was used. One-sample t-tests were used to compare scores on the GAD-7, PHQ-8 and SHAI to previously collected general population data. Preliminary analysis of the distribution of the data indicated all variables had a positive skew, reflecting most scores clustering towards the non-clinical end of the scale. As one-sample t-tests are considered robust to skewed distributions (Wilcox, 2012), a non-parametric equivalent was not used.

Difference in IU, generalized anxiety, depression, and health anxiety scores between vulnerable groups and the general population were assessed using a one-way MANOVA. Levene's Test highlighted that the assumption of homogeneity of variances had been violated ($p < .05$), so all four dependent variables were transformed using a square root transformation. The normal Q-Q plots indicated that following transformation the variables were approximately normally distributed. Pearson's correlations identified no multicollinearity between dependent variables ($r < .90$; see Table 4), and scatterplots highlighted that there was a linear relationship between the dependent variables in both vulnerable and non-vulnerable groups. Mahalanobis distance identified multivariate outliers, but these were not removed as removing these outliers did not change the profile of results. There was homogeneity of variances and covariances, as shown by the non-significant result on Box's test ($p = .847$).

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Finally, multiple parallel mediation modeling using the PROCESS macro for SPSS (Hayes, 2017) explored whether IU predicted mental health variables (i.e. anxiety, depression and health anxiety scores), and whether adaptive and maladaptive coping responses mediated this relationship. Based on information from previous literature (e.g. WHO World Mental Health Survey Consortium, 2007; McLean et al., 2011; Scott et al., 2007) and following preliminary analysis of study demographic data, gender, age, previous mental health condition and vulnerable group status were all inputted as covariates to isolate the effects of IU and coping responses. Indirect effects were tested using non-parametric bootstrapping with 5,000 samples. When 95% confidence intervals did not include zero, the indirect effect was considered significant (Hayes, 2017).

For all three mediation models, assumptions were met. Residuals were approximately normally distributed, and independence of residuals was indicated by the Durbin-Watson statistic (Anxiety = 1.97, Depression = 1.91, Health anxiety = 2.01). Homoscedasticity was shown by visually inspecting studentized residuals versus unstandardized predicted values plot.

Results

Comparison to General Population Data

Mean anxiety scores (M = 6.42, SD = 5.09) were significantly higher than scores taken from normative data (M = 2.97; Löwe et al., 2008), $t(841) = 3.45$, $p < .001$. Löwe et al.'s (2008) study indicated that approximately 5% of their sample had GAD-7 scores of 10 or above, similar to the prevalence of GAD found in the 2014 Adult Psychiatric Morbidity Survey (5.9%; McManus et al., 2016). In the current study 24.3% of individuals were above this clinical cut off, 95% CI [21.5, 27.3].

Mean depression scores (M = 6.76, SD = 5.36) were significantly higher than the mean PHQ-8 score from a recent meta-analysis (M = 5.30, SD = 5.20; Wu et al., 2019), $t(841) = 7.91$, $p < .001$. Kroenke et al. (2009) reported that 8.6% of individuals in their sample scored above the clinical cut off of 10 or above, in comparison to 25.8% of individuals in the current sample, 95% CI [22.9, 28.8].

The mean health anxiety score in the current sample was 11.21 (SD = 6.71), which is significantly higher than the mean score from a non-clinical sample in previous research (M = 9.19; Alberts et al., 2011), $t(841) = 8.74$, $p < .001$. This significant difference remained even when excluding those of physical health status who are known to have higher health anxiety scores (Tyrer et al., 2011; M= 10.53, $t(650) = 5.34$, $p <$ .001). Previous studies have indicated that individuals meeting criteria for a health anxiety diagnosis within the general population is around 4-6% (Bleichhardt & Hiller, 2007; Sunderland et al., 2013), whereas in the current sample, 14.8% of individuals scored above the clinical cut-off of 18 and above (Tang et al., 2007), 95% CI [12.6, 17.4].

Comparing Vulnerable and Non-Vulnerable Groups

Table 3 summarises the mean questionnaire scores for vulnerable and non-vulnerable groups. A one-way MANOVA showed that there was an overall significant difference between vulnerable and non-vulnerable groups on the dependent variables, $F(4, 837) = 8.97$, $p < .001$, Wilks' Lambda = .96, partial η2 = .04. Follow-up univariate ANOVAs using a Bonferroni adjusted p value of .013 found that there were statistically significant differences in anxiety ($F(1, 840) = 12.05$, $p = .001$; partial $\eta^2 = .01$) and health anxiety ($F(1, 840) = 31.63$, $p < .001$; partial $\eta^2 = .04$) between the two groups, but not for depression ($F(1, 840) = 4.82$, $p = .028$; partial $\eta^2 = .01$) or intolerance of uncertainty ($F(1, 840) = 2.25$, $p = .134$; partial $\eta^2 = .00$). Using Cohen's (1988) criteria for partial η^2, the effect size for health anxiety and generalised anxiety differences were small.

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Individuals in vulnerable groups scored higher on health anxiety and generalised anxiety measures than individuals in non-vulnerable groups. In the vulnerable group, 30.9% of individuals group displayed clinical levels of generalised anxiety, and 24.1% displayed clinical levels of health anxiety (in comparison to 22.4% and 12.1% found in the rest of the sample).

[INSERT TABLE 3]

Coping Responses and Intolerance of Uncertainty

The most commonly used coping strategies were acceptance (adaptive; *M* = 6.33, *SD* = 1.50), self-distraction (maladaptive; *M* = 5.81, *SD* = 1.52) and active coping (i.e. taking actions to improve the situation; adaptive; *M* = 5.02, *SD* = 1.67). The least commonly used coping strategies were denial (maladaptive; *M* = 2.57, *SD* = 1.13), behavioural disengagement (i.e. giving up; maladaptive; *M* = 2.86, *SD* = 1.27), and religion (adaptive; *M* = 2.88, *SD* = 1.55).

Looking at the coping subscales, correlational analyses (Table 4) identified that there was a significant, positive relationship between the use of adaptive and maladaptive coping responses. Correlational analyses also highlighted that all mental health variables were significantly, positively correlated with one another, and there was a significant, positive correlation between IU and mental health scores, IU and maladaptive coping, and maladaptive coping and mental health outcomes. Adaptive coping was not significantly correlated (p <.001) with any of the main study variables.

[INSERT TABLE 4]

Three mediation models were run to determine whether IU predicted mental health difficulties, and to establish if maladaptive and adaptive coping mediated this relationship, over and above control variables (age, gender, previous mental health diagnosis and vulnerable group status).

Generalized Anxiety

Results from the parallel mediation analysis are summarized in Figure 1. People with higher IU were significantly more likely to use maladaptive coping strategies (a_2 = .012, $t(836) = 16.06$, $p < .001$), and increased use of maladaptive coping strategies was subsequently related to greater levels of generalized anxiety (b_2 = .389, $t(834) = 11.57$, $p < .001$). Holding all control variables and adaptive coping constant, the indirect path of IU on anxiety via maladaptive coping was statistically significant (a_2b_2 = .046, 95% CI [0.037, 0.056]). Conversely, the indirect effect through adaptive coping was not statistically significant (a_1b_1 = -.001, 95% CI [-0.002, 0.001]). The direct effect of IU on generalized anxiety when keeping all potential mediators and covariates constant was significant (c' = .077, $p < .001$). Overall, findings show that the relationship between IU and generalized anxiety was partially mediated by the maladaptive, but not adaptive coping subscale of the brief COPE.

[INSERT FIGURE 1]

Demographic variables were statistically controlled for in the analysis, and higher GAD-7 scores were found in females, those younger in age, individuals with previous mental health difficulties, and individuals categorized in the vulnerable group.

Depression

Results from the parallel mediation analysis for depression are summarized in Figure 2. As shown in the previous analysis, people with higher IU were significantly more likely to use maladaptive coping strategies (a_2 = .012, $p < .001$), and increased use of maladaptive coping strategies was subsequently related to greater levels of depression (b_2 = .442, $t(834) = 12.41$, $p < .001$). Holding all control variables and adaptive coping constant, the indirect path of IU on depression via maladaptive coping was statistically significant (a_2b_2 = .053, 95% CI [0.042, 0.064]). Conversely, the indirect

effect through adaptive coping was not statistically significant (a_1b_1 = -.002, 95% CI [-0.005, 0.002]). The direct effect of IU on depression when keeping all potential mediators and covariates constant was significant (c' = .070, p < .001). Overall, findings show that the relationship between IU and depression was partially mediated by the maladaptive, but not adaptive coping subscale of the brief COPE.

[INSERT FIGURE 2]

A similar picture was found for the control variables in the depression analysis, with higher PHQ-8 scores were found in females, those younger in age and individuals with previous mental health difficulties.

Health Anxiety

Finally, results from the parallel mediation analysis for health anxiety are summarized in Figure 3. Once again, people with higher IU were significantly more likely to use maladaptive coping strategies (a_2 = .012, p < .001), and increased use of maladaptive coping strategies was subsequently related to greater levels of health anxiety (b_2 = .183, t(834) = 3.59, p < .001). Holding all control variables and adaptive coping constant, the indirect path of IU on health anxiety via maladaptive coping was statistically significant (a_2b_2 = .022, 95% CI [0.009, 0.035]). Conversely, the indirect effect through adaptive coping was not statistically significant (a_1b_1 = 0.00, 95% CI [-0.002, 0.001]). The direct effect of IU on health anxiety when keeping all potential mediators and covariates constant was significant (c' = .118, p < .001). Overall, findings show that the relationship between IU and health anxiety was partially mediated by the maladaptive, but not adaptive coping subscale of the brief COPE.

[INSERT FIGURE 3]

Demographic variables statistically controlled for in the analysis showed that higher SHAI scores were found in females, individuals with previous mental health difficulties, and individuals categorized in the vulnerable group.

Post-hoc Analysis of Adaptive Coping Responses

A non-significant relationship was found in all three mediation models between IU and adaptive coping (see Figures 1-3). Post-hoc correlational analysis breaking adaptive coping down into it's eight original subscales (i.e. planning, seeking emotional support, positive reframing, active coping, acceptance, seeking informational support, humor, religion) provided further insight into this non-significant result. The adaptive strategies that are associated with help-seeking and preparation (i.e. emotional support, instrumental support and planning; $p < .001$) were significantly positively correlated with IU ($p < .001$), suggesting those who were high in IU were more likely to use these help seeking strategies. Conversely, other adaptive strategies such as acceptance had a significant, negative correlation with IU ($p < .001$; see supplementary material for full post-hoc correlation table), indicating high IU individuals were less likely use these.

Discussion

The current study aimed to investigate the relative impact of intolerance of uncertainty and coping responses on anxiety, depression and health anxiety during the COVID-19 pandemic. We further sought to assess whether current rates of psychological distress were higher than previous populations norms, particularly for those individuals categorized by the government as "vulnerable".

Overall, findings demonstrated that generalized anxiety, depression and health anxiety rates were elevated within the current sample, with 37.5% of individuals above clinical cut-off for at least one of the three measured conditions, and 19.8% of

individuals meeting two or more thresholds. This is higher than rates seen in previous pandemic research (e.g. Cheng et al., 2004, Sprang and Silman, 2013; Wang et al., 2020), and provides a clear indication that COVID-19 is having a profoundly negative impact on the general population's mental health. Incidence of anxiety and depression in this sample is significantly higher than previous population norms (17%; McManus et al., 2016), despite disclosed *previous* mental health difficulties reflecting population norms. In addition, analysis of control variables indicated that particular groups of individuals could be at increased risk of developing mental health difficulties during this time, specifically females, those younger in age (for generalized anxiety and depression only), and individuals with previous mental health difficulties.

Those who identified with the UK government defined "vulnerable group" were significantly more likely to reach threshold for health anxiety or generalized anxiety than those who did not. This is consistent with previous research reporting high prevalence of health anxiety in medical and hospital samples (Alberts et al., 2011; Daniels et al., 2020), with highest reported rates of a similar 24.7% (Tyrer et al., 2011), where the normal range is 4-6% (Bleichhardt & Hiller, 2007; Sunderland et al., 2013). It is likely that during a time of increased threat such as an infectious disease pandemic, individuals with physical health conditions are likely to be vigilant, checking for symptoms and signs of COVID-19, avoiding contamination, and taking other strategic and automatic behaviours which inadvertently perpetuate or precipitate health anxiety (Salkovskis et al., 2003). Thus elevated rates of health anxiety are unsurprising, particularly given the higher rates of mortality in those with underlying conditions (Office for National Statistics, 2020).

Indeed, health anxiety may be seen as adaptive in this context, with anxiety previously being associated with higher compliance in safety precautions during

pandemics (Rubin et al., 2009). Many of these individuals will continue to 'shield' for longer during current and future pandemic waves (Public Health England, 2020), therefore it is essential that their mental health needs are addressed in an accessible, evidence-based way (e.g. cognitive behavioural therapy; Hofmann et al., 2012).

Predictors and Mediators of Psychological Distress

Predictors and Mediators of Psychological Distress

In a recent paper published in the Lancet, Holmes et al. (2020) outlined that psychological support for COVID-19 should be 'mechanistically informed'. Current findings indicated that IU predicted the three mental health difficulties studied within this paper, and maladaptive coping responses partially mediated this relationship. This extends on Taha et al.'s (2014) research that found emotion-focused coping mediated the relationship between IU and H1N1-specific anxiety, as current findings highlight the transdiagnostic importance of these variables (Einstein, 2014). This finding is of clinical importance, as IU and maladaptive coping responses are modifiable factors that could be targeted when adapting psychological interventions for COVID-19.

Individuals in vulnerable groups were not significantly different in their ability to tolerate uncertainty than the rest of the general population, which may be attributed to an adapted tolerance of uncertainty when living with a long-term health condition (Kurita et al., 2013). Freeston et al.'s (2020) model of uncertainty distress suggests that alongside intolerance of uncertainty, 'perceived threat' (i.e. degree to which one feels under threat) independently contributes to psychological distress. Thus it could be that for physically vulnerable individuals, it is the perceived (and arguably realistic) *increase* in threat, rather than their overall ability to tolerate uncertainty, that contributes to their increased levels of psychological distress. This should be examined further.

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Current and future treatments may benefit from targeting modifiable predictors of psychological distress such as IU and maladaptive coping to help ameliorate distress in the context of these abnormal times, where uncertainty and threat in our lives has increased. Current evidence-based models of CBT for generalized anxiety (National Institute for Health and Care Excellence [NICE], 2011), depression (NICE, 2009) and health anxiety (Salkosvkis et al., 2003) may be benefit from adaptation to incorporate IU and patterns of coping as discussed herewith. For example, from both our results and proposed models of IU (Freeston et al., 2020) it could be theorized that individuals who are struggling with their mental health may find uncertainty difficult to manage, and may be more likely to be using maladaptive coping strategies such as self-distraction as a result. Maladaptive strategies such as these can perpetuate distress by preventing disconfirmation of the feared outcome (Salkovskis et al., 2003). Thus, public health strategies should focus on providing resources to encourage and equip the public in the use of adaptive coping strategies such as acceptance, and appropriate levels of support seeking (Daniels, 2020), to increase tolerance of uncertainty during this time.

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However, it is worth noting that adaptive strategies were not a significant mediator. As reflected in the post-hoc analysis, this is perhaps due to an underuse of some adaptive strategies (e.g. acceptance) and increased use of particular 'help-seeking' strategies (e.g. seeking emotional and instrumental support) in individuals who find it difficult to tolerate uncertainty. The potential overuse of 'help-seeking' type strategies may be reflective of safety-seeking behaviours commonly seen in health anxiety and GAD such as reassurance seeking, however the degree of safety-seeking and whether this constitutes 'excessive', for example, is purely speculative. In these cases, commonly considered adaptive strategies have the potential to become maladaptive (i.e. maintain

the difficulties; Salkovskis et al., 2003), therefore this should be kept in mind when considering how to appropriately promote their use.

Regarding the potential benefit of increasing tolerance of uncertainty in the general public, previous transdiagnostic treatments of IU have already been established (e.g. Robichaud & Dugas, 2006) and form part of recommended UK guidelines (NICE, 2011). Concepts from these treatments could be adapted to provide psychological support and guidance in a more structured and targeted way to those who are struggling the most with uncertainty. It is likely that while face-to-face contact is limited, online resources will be particularly useful and have been found to be as efficacious as traditional interventions (Carlbring et al., 2018). Development of online resources now will help prepare for future infection waves and pandemics.

Limitations

At 20%, males were under-represented within the current study. Previous research suggests over-representation of females is common in mental health online surveys (Batterham, 2014), and that females have greater levels of mental health difficulties than males (19% compared to 12%; McManus et al., 2016). However, the rates of existing mental health difficulties were found to be typical of the general population, and rates of current mental health difficulties found within this study were still significantly above those rates found in females alone.

The scope of this project was restricted to the public, and future research could seek to determine whether other groups that may be less able to tolerate uncertainty and more vulnerable to psychological distress. For example, Kang et al. (2020) suggested that rates of distress may be even higher in 'key worker' populations. However this data is currently emerging (Roberts et al. 2020). In addition, the current study considered whether people in vulnerable groups were more likely to experience

psychological distress, but did not ask whether individuals had close friends or family that were vulnerable when families are expected to 'shield' together. It raises the question of indirect impact.

Finally, this study is cross-sectional in nature and therefore the mediation analyses offer an impression of directionality that could be explored further in future experimental research.

Longitudinal research replicating current findings would firmly establish the psychological impact of COVID-19 and how intolerance of uncertainty and distress will change over the course of the current and future waves of the pandemic.

Conclusions

This study is the first to examine health anxiety and coping responses in the general population during COVID-19, adding to the emerging literature on psychological distress and intolerance of uncertainty during unprecedentedly uncertain times. Overall, this study reflects increased mental health difficulties during the first wave of the COVID-19 pandemic in the UK, highlighting the importance of targeting modifiable variables to enable the public to manage their psychological health during this time, equipping them for potential future pandemic waves.

References

Abramowitz, J. S., Deacon, B. J., & Valentiner, D. P. (2007). The Short Health Anxiety Inventory: Psychometric properties and construct validity in a non-clinical sample. *Cognitive Therapy and Research, 31*(6), 871-883.

Alberts, N. M., Sharpe, D., Kehler, M. D., & Hadjistavropoulos, H. D. (2011). Health anxiety: Comparison of the latent structure in medical and non-medical samples. *Journal of Anxiety Disorders*, *25*(4), 612-614.

Batterham, P. J. (2014). Recruitment of mental health survey participants using Internet advertising: Content, characteristics and cost effectiveness. *International Journal of Methods in Psychiatric Research*, *23*(2), 184-191.

Birrell, J., Meares, K., Wilkinson, A., & Freeston, M. (2011). Toward a definition of intolerance of uncertainty: A review of factor analytical studies of the Intolerance of Uncertainty Scale. *Clinical Psychology Review*, *31*(7), 1198-1208.

Bleichhardt, G., & Hiller, W. (2007). Hypochondriasis and health anxiety in the German population. *British Journal of Health Psychology*, *12*(4), 511-523.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, *395*(10227), 912-920.

Buhr, K., & Dugas, M. J. (2002). The intolerance of uncertainty scale: Psychometric properties of the English version. *Behaviour Research and Therapy*, 40(8), 931-945.

Cabinet Office. (2020, March 29). Guidance: Staying at home and away from others (social distancing). *UK Government*. https://www.gov.uk/government/publications/full-guidance-on-staying-at-home-and-away-from-others/full-guidance-on-staying-at-home-and-away-from-others

Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., & Hedman-Lagerlöf, E. (2018). Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: An updated systematic review and meta-analysis. *Cognitive Behaviour Therapy*, *47*(1), 1-18.

Field Code Changed

Carleton, R. N., Duranceau, S., Freeston, M. H., Boelen, P. A., McCabe, R. E., & Antony, M. M. (2014). "But it might be a heart attack": Intolerance of uncertainty and panic disorder symptoms. *Journal of Anxiety Disorders*, *28*(5), 463-470.

Carleton, R. N., Mulvogue, M. K., Thibodeau, M. A., McCabe, R. E., Antony, M. M., & Asmundson, G. J. (2012). Increasingly certain about uncertainty: Intolerance of uncertainty across anxiety and depression. *Journal of Anxiety Disorders*, *26*(3), 468-479.

Carver, C. S. (1997). You want to measure coping but your protocol' too long: Consider the brief cope. *International Journal of Behavioral Medicine, 4*(1), 92-110.

Cheng, S. K., Wong, C. W., Tsang, J., & Wong, K. C. (2004). Psychological distress and negative appraisals in survivors of severe acute respiratory syndrome (SARS). *Psychological Medicine, 34*(7), 1187-1195.

Cheema, J. R. (2014). Some general guidelines for choosing missing data handling methods in educational research. *Journal of Modern Applied Statistical Methods, 13*(2), 53-75.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.

Daniels, J. (2020). Coronavirus: how to stop the anxiety spiralling out of control. *The Conversation.* https://theconversation.com/coronavirus-how-to-stop-the-anxiety-spiralling-out-of-control-133166

Daniels, J., Salkovskis, P., & Parker, H. (2020). Prevalence and Treatment of Chronic Fatigue Syndrome/ME and Co-morbid Severe Health Anxiety. *International Journal of Clinical and Health Psychology*, *20*(1), 10-19.

Department of Health and Social Care. (2020). Guidance: Number of coronavirus (COVID-19) cases and risk in the UK. *UK Government.* https://www.gov.uk/guidance/coronavirus-covid-19-information-for-the-public

Field Code Changed

Einstein, D. A. (2014). Extension of the transdiagnostic model to focus on intolerance of uncertainty: A review of the literature and implications for treatment. *Clinical Psychology: Science and Practice, 21*(3), 280-300.

Eisenberg, S. A., Shen, B. J., Schwarz, E. R., & Mallon, S. (2012). Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *Journal of Behavioral Medicine, 35*(3), 253-261.

Fergus, T. A., & Bardeen, J. R. (2013). Anxiety sensitivity and intolerance of uncertainty: Evidence of incremental specificity in relation to health anxiety. *Personality and Individual Differences, 55*(6), 640-644.

Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994). Why do people worry?. *Personality and Individual Differences, 17*(6), 791-802.

Freeston, M., Tiplady, A., Mawn, L., Bottesi, G., & Thwaites, S. (2020). Towards a model of uncertainty distress in the context of Coronavirus (COVID-19). *PsyArXiv.* https://doi.org/10.31234/osf.io/v8q6m

Hagan, T. L., Fishbein, J. N., Nipp, R. D., Jacobs, J. M., Traeger, L., Irwin, K. E., Pirl, W. F., Greer, J. A., Park, E. R., Jackson, V. A., & Temel, J. S. (2017). Coping in patients with incurable lung and gastrointestinal cancers: A validation study of the Brief COPE. *Journal of Pain and Symptom Management, 53*(1), 131-138.

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.

Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive Therapy and Research*, *36*(5), 427-440.

Holaway, R. M., Heimberg, R. G., & Coles, M. E. (2006). A comparison of intolerance of uncertainty in analogue obsessive-compulsive disorder and generalized anxiety disorder. *Journal of Anxiety Disorders*, *20*(2), 158-174.

Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Pryzybylski, A. K., Shadran, R., … & Bullmore, E. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry, 7*(6), 547-560.

Jakobsen, J. C., Gluud, C., Wetterslev, J., & Winkel, P. (2017). When and how should multiple imputation be used for handling missing data in randomised clinical trials–a practical guide with flowcharts. *BMC Medical Research Methodology*, *17*(162). https://doi.org/10.1186/s12874-017-0442-1

Kang, L., Li, Y., Hu, S., Chen, M., Yang, C., Yang, B. X., Wang, Y., Hu, J., Lai, J., Ma, X., Chen, J., Guan, L., Wang, G., Ma, H., & Liu, Z. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *The Lancet Psychiatry*, *7*(3), Article e14.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606-613.

Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals, 32*(9), 509-515.

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders, 114*(1-3), 163-173.

Kurita, K., Garon, E. B., Stanton, A. L., & Meyerowitz, B. E. (2013). Uncertainty and psychological adjustment in patients with lung cancer. *Psycho-Oncology, 22*(6), 1396-1401.

Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. *Medical Care*, 266-274.

Mahmoud, J. S. R., Staten, R. T., Hall, L. A., & Lennie, T. A. (2012). The relationship among young adult college students' depression, anxiety, stress, demographics, life satisfaction, and coping styles. *Issues in Mental Health Nursing, 33*(3), 149-156.

McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: Prevalence, course of illness, comorbidity and burden of illness. *Journal of Psychiatric Research, 45*(8), 1027-1035.

McManus, S., Meltzer, H., Brugha, T., Bebbington, P. E., & Jenkins, R. (2009). *Adult psychiatric morbidity in England: Results of a household survey*. Health and Social Care Information Centre.

McManus, S., Bebbington, P., Jenkins, R., Brugha, T. (2016). *Mental health and wellbeing in England: Adult psychiatry morbidity survey 2014*. NHS Digital.

Meyer, B. (2001). Coping with severe mental illness: Relations of the Brief COPE with symptoms, functioning, and well-being. *Journal of Psychopathology and Behavioral Assessment, 23*(4), 265-277.

Monzani, D., Steca, P., Greco, A., D'Addario, M., Cappelletti, E., & Pancani, L. (2015). The situational version of the Brief COPE: Dimensionality and relationships with goal-related variables. *Europe's Journal of Psychology, 11*(2), 295-310.

National Health Service (2020a). *Check if you have coronavirus symptoms.* https://www.nhs.uk/conditions/coronavirus-covid-19/check-if-you-have-coronavirus-symptoms/

National Health Service. (2020b). *Advice for people at higher risk: Coronavirus (COVID-19).* https://www.nhs.uk/conditions/coronavirus-covid-19/advice-for-people-at-high-risk/

National Institute for Health and Care Excellence. (2009). *Depression in adults: Recognition and management* (Clinical Guideline No. 90). https://www.nice.org.uk/guidance/cg90

National Institute for Health and Care Excellence. (2011). *Generalised anxiety disorder and panic disorder in adults: Management* (Clinical Guideline No. 113). https://www.nice.org.uk/guidance/cg113

Office for National Statistics. (2020). *Deaths involving COVID-19, England and Wales: Deaths occurring in April 2020.* https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsinvolvingcovid19englandandwales/latest#covid-19-and-the-overall-mortality-rate-for-april

Public Health England. (2020). *Guidance on shielding and protecting people who are clinically extremely vulnerable from COVID-19*. https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic:

Field Code Changed

Implications and policy recommendations. *General Psychiatry, 33*(2), Article e100213.

Roberts, T, Daniels, J …. Carlton, E. (2020). *The COVID-19 Emergency Response Assessment Study*. Phase one findings, in submission.

Robichaud, M., & Dugas, M. J. (2006). A cognitive-behavioral treatment targeting intolerance of uncertainty. In G. C. L. Davey & A. Wells (Eds,), *Worry and its psychological disorders: Theory, assessment and treatment* (pp. 289-304).

Rubin, G. J., Amlôt, R., Page, L., & Wessely, S. (2009). Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: Cross sectional telephone survey. *BMJ*, *339*. https://doi.org/10.1136/bmj.b2651.

Salkovskis, P. M., Rimes, K. A., Warwick, H. M. C., & Clark, D. M. (2002). The Health Anxiety Inventory: Development and validation of scales for the measurement of health anxiety and hypochondriasis. *Psychological Medicine, 32*(5), 843-853.

Salkovskis, P. M., Warwick, H. M., & Deale, A. C. (2003). Cognitive-Behavioral Treatment for Severe and Persistent Health Anxiety (Hypochondriasis). *Brief Treatment & Crisis Intervention*, *3*(3), 353-367.

Scott, K. M., Bruffaerts, R., Tsang, A., Ormel, J., Alonso, J., Angermeyer, M. C., Benjet, C., Bromet, E., de Girolamo, G., de Graaf, R., Gasquet, I., Gureje, O., Haro, J. M., He, Y., Kessler, D., Levinson, D., Mneimneh, Z. N., Oakley Browne, M. A., … & Von Korff, M. (2007). Depression–anxiety relationships with chronic physical conditions: Results from the World Mental Health Surveys. *Journal of Affective Disorders, 103(*1-3), 113-120.

Sim, K., & Chua, H. C. (2004). The psychological impact of SARS: A matter of heart and mind. *Canadian Medical Association Journal*, *170*(5), 811-812.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine, 166*(10), 1092-1097.

Sprang, G., & Silman, M. (2013). Posttraumatic stress disorder in parents and youth after health-related disasters. *Disaster Medicine and Public Health Preparedness, 7*(1), 105-110.

Sunderland, M., Newby, J. M., & Andrews, G. (2013). Health anxiety in Australia: Prevalence, comorbidity, disability and service use. *The British Journal of Psychiatry*, *202*(1), 56-61.

Taha, S., Matheson, K., Cronin, T., & Anisman, H. (2014). Intolerance of uncertainty, appraisals, coping, and anxiety: The case of the 2009 H1N1 pandemic. *British Journal of Health Psychology, 19*(3), 592-605.

Tang, N. K., Wright, K. J., & Salkovskis, P. M. (2007). Prevalence and correlates of clinical insomnia co-occurring with chronic back pain. *Journal of Sleep Research, 16*(1), 85-95.

Tyrer, P., Cooper, S., Crawford, M., Dupont, S., Green, J., Murphy, D., ... & Keeling, M. (2011). Prevalence of health anxiety problems in medical clinics. *Journal of Psychosomatic Research*, *71*(6), 392-394.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R. S., Choo, F. N., Tran, B., Ho, R., Sharma, V. K., & Ho, C. (2020). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain, Behavior, and Immunity*. https://doi.org/10.1016/j.bbi.2020.04.028

WHO Mental Health Survey Consortium. (2007). Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry, 6*(3), 168-176.

Wilcox, R. (2012). *Introduction to robust estimation and hypothesis testing* (3rd ed.). Elsevier.

Wilder-Smith, A., Chiew, C. J., & Lee, V. J. (2020). Can we contain the COVID-19 outbreak with the same measures as for SARS?. *The Lancet Infectious Diseases, 20*(5), 102-107.

World Health Organisation. (2020a). *Coronavirus*. https://www.who.int/health-topics/coronavirus#tab=tab_3

World Health Organisation. (2020b). *Coronavirus disease (COVID-19): Situation report 133*. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200601-covid-19-sitrep-133.pdf?sfvrsn=9a56f2ac_4

Wu, Y., Levis, B., Riehm, K. E., Saadat, N., Levis, A. W., Azar, M., ... & Ioannidis, J. P. (2019). Equivalency of the diagnostic accuracy of the PHQ-8 and PHQ-9: A systematic review and individual participant data meta-analysis. *Psychological Medicine*, 1-13.

Xiang, Y. T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., & Ng, C. H. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry, 7*(3), 228-229.

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Tables

Table 1

Demographics Information for Total Sample

Demographic	*n*	%
Gender		
Male	163	19.4
Female	673	79.9
Other/Prefer not to say	6	0.7
Ethnicity		
White	799	95.1
Mixed/multiple ethnic groups	13	1.5
Asian/Asian British	20	2.4
Black/African/Caribbean/Black British	5	0.6
Other ethnic group	3	0.4
Employment		
Working (full time)	489	58.3
Working (part time)	109	13.0
Not working (furloughed)	77	9.2
Not working (looking for work)	14	1.7
Not working (disabled)	68	1.1
Not working (retired)	9	8.1
Not working (other)	29	3.5
Student	44	5.2

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Table 2

Percentage of Vulnerable Participants in each Group Category

Category	*n*	% of vulnerable group
Aged 70 or older	23	12.0
Chronic respiratory diseases	83	43.5
Chronic heart disease	7	3.7
Chronic kidney disease	1	0.5
Chronic liver disease	2	1.0
Chronic neurological conditions	5	2.6
Diabetes	22	11.5
Problems with spleen	2	1.0
Weakened immune system	20	10.5
Seriously overweight (BMI >=40)	18	9.4
Pregnant	19	9.9
Other	18	9.4

Note. Total *N* = 191. Percentages add up to over 100% due to some participants reporting multiple conditions.

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Table 3

Summary Statistics for Total Sample

Questionnaire	Vulnerable Group		Non-vulnerable Group		Total (N = 842)	
	M (*SD*)	Range	*M* (*SD*)	Range	*M* (*SD*)	Range
GAD-7	7.57 (5.53)	21	6.09 (4.91)	21	6.42 (5.09)	21
PHQ-8	7.52 (5.67)	23	6.54 (5.25)	24	6.76 (5.36)	24
SHAI	13.55 (7.27)	39	10.53 (6.38)	41	11.21 (6.71)	41
IU	61.92 (19.84)	92	59.57 (20.34)	93	60.11 (20.24)	93
Coping						
Adaptive	36.43 (8.06)	43	36.73 (7.76)	42	36.66 (7.82)	43
Maladaptive	21.82 (5.12)	25	21.08 (4.73)	28	21.25 (4.83)	28

Note. GAD-7 measures anxiety, PHQ-8 measures depression, SHAI measures health anxiety, and IU is the intolerance of uncertainty scale.

Table 4

Pearson's Correlations Between Main Study Variables

	1	2	3	4	5	6
1. Generalized anxiety	-	.75**	.54**	.58**	.08*	.58**

2. Depression	-	.44**	.55**	-.01	.57**
3. Health Anxiety		-	.48**	.06	.38**
4. IU			-	.06	.55**
5. Adaptive Coping				-	.29**
6. Maladaptive Coping					-

Note. * p < .05, ** p < .001. IU = intolerance of uncertainty.

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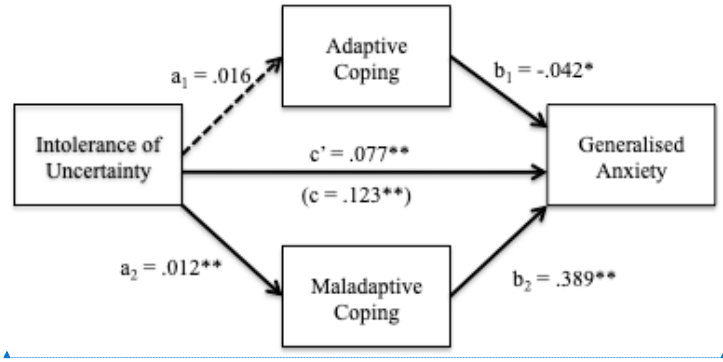
Figures

Figure 1

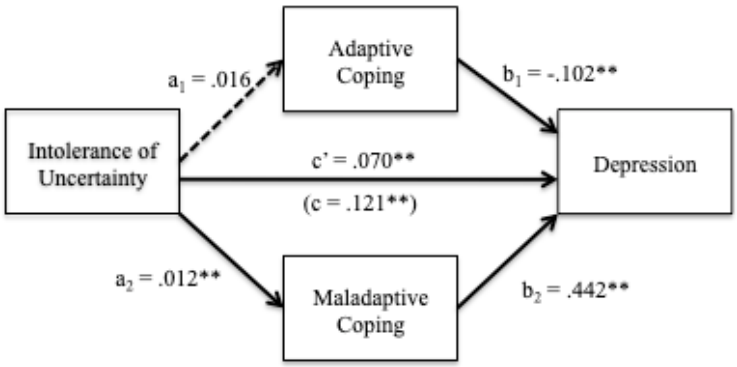
Model Showing the Mediating Effect of Coping Between IU and Generalized Anxiety.



Note. *p < .05, **p < .001. Dotted arrow shows non-significant relationship. *a* = effect of IU on the mediators, b = effect of the mediators on anxiety, c' = direct effect of IU on generalized anxiety, and c = total effect of IU on anxiety.

Figure 2

Model Showing the Mediating Effect of Coping Between IU and Depression



Note. *p < .05, **p < .001. Dotted arrow shows non-significant relationship. *a* = effect of IU on the mediators, b = effect of the mediators on depression, c' = direct effect of IU on depression, and c = total effect of IU on depression.

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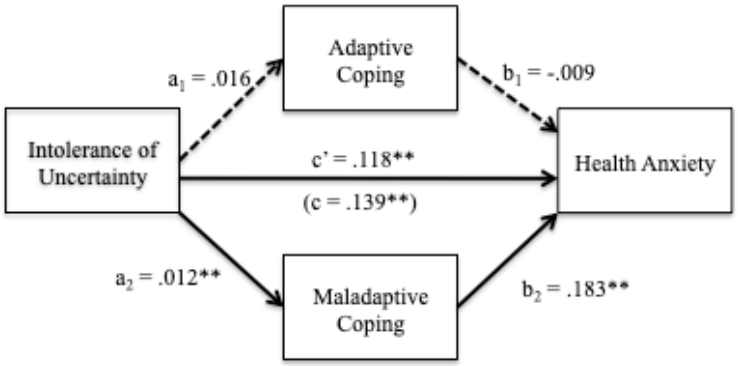
Figure 3

Model Showing the Mediating Effect of Coping Between IU and Health Anxiety.



Note. *p < .05, **p < .001. Dotted arrow shows non-significant relationship. *a* = effect of IU on the mediators, b = effect of the mediators on health anxiety, c' = direct effect of IU on health anxiety, and c = total effect of IU on health anxiety.

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