

Anxiety in Patients and Medical Providers during the Covid-19 Pandemic

Hussein Al-Warith, Udo Schneider, Sarah Rohlfig

Universitätsklinik für Psychiatrie und Psychotherapie der Ruhr-Universität Bochum, Campus OWL, Bochum, Germany

Email: Hussein.Al-Warith@muehlenkreiskliniken.de

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Abstract

Although much existing research has focussed on the impact of the current Covid-19 pandemic on mental health in general populations worldwide, there remains a gap in knowing how it impacts those especially vulnerable to negative psychological effects. The main objective of this study was to compare the mental health impact of the pandemic on people with and without a pre-existing psychiatric history. Another objective of this study was to explore this impact on a range of variables known to favor anxiety. Results confirmed that the negative mental health impact of the pandemic is significantly higher for those who could be seen to be especially vulnerable. They also confirmed most of the predicted variables significantly favor anxiety. Overall, the findings of this study not only helped to identify and confirm groups vulnerable to negative mental health outcomes following crises, but they could also help to tailor existing treatment options to them during future outbreaks and/or other pandemics.

Keywords

Mental Health, Anxiety, Vulnerable Groups, Public Policy

1. Introduction

Since the outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in Wuhan, China, in December 2019, many people across the globe have suffered or died from becoming infected with the virus. Whilst there was no vaccine against the virus, governments worldwide ordered a range of severe social restrictions to try and slow down the spread of it (for example, lockdowns, minimal freedom of movement, temporary closure of borders and a range of non-essential businesses, including schools and nurseries). Unsurprisingly, the impact of these severe restrictions during the ongoing pandemic (for

example, anxiety and depression as a consequence to fear of becoming infected, financial loss and social isolation) on the general population's mental health have become the focus of recent research into the psychiatric symptoms of people during the COVID-19 pandemic. This line of research clearly suggests that people worldwide suffer from increased generalised anxiety and depression during the pandemic [1] [2] [3]. In addition, previous pandemic research found that quarantine, isolation and social distancing have all been related to increased anxiety and depression in the general population [4].

Yet, we know little about how government-ordered restrictions during the current pandemic might affect those who could be seen as especially vulnerable namely, those with pre-existing mental health conditions, such as depression or anxiety disorders, older age, low education, or unemployment. For example, anxious or depressed people might experience the government-ordered restrictions even more, which could lead to more anxiety and/or negative emotions. Specifically, social distancing might lead to increased feelings of loss and social support, as well as interfere with peoples' daily routines, which are essential to those experiencing anxiety or depression. Therefore, a loss of these structures is likely to increase pre-existing symptoms.

In line with this, it has already been argued that, amongst others (for example, women, older adults and minority groups), those with a pre-existing psychiatric history, low education and/or low socioeconomic status have an increased susceptibility to negative psychological effects during or after the crisis, including epidemics [5].

There are few recent findings with foci on some of these groups. For example, people with prior mental health diagnoses showed greater psychological distress than those without [6]. In addition, it was found that anxiety in relation to COVID-19 was indeed greater in older people [3]. In line with this, several studies found that women are more anxious about COVID-19 than men [7] [8] [9]. Yet, the evidence surrounding gender differences in relation to anxiety during the Covid-19 pandemic is also mixed. For example, several studies found no gender differences in anxiety during the early stages of the pandemic [10] [11].

Taken together, whilst there is some research into groups that could be classified as most vulnerable, the results are few and the evidence is mixed. It is therefore of great importance to identify those who are in need of increased support during the current pandemic in order to adequately and effectively adopt policies and support.

The primary aim of this study was therefore to compare the mental health impact of the Covid-19 pandemic (measured in anxiety levels) on people with and without pre-existing mental health conditions. It was hypothesised that participants with pre-existing mental health conditions show more anxiety than those without. The secondary aim of the study was to assess a range of other known factors associated with susceptibility to anxiety in light of the Covid-19 pandemic. These included gender, old age, low educational level and unemployment.

Based on the research discussed above, it was expected that participants with pre-existing mental health conditions report more anxiety than those with no pre-existing mental health conditions. Also, it was predicted that female participants show more anxiety than male participants. In addition, it was hypothesised that older participants show the highest levels of anxiety compared to younger participants. Furthermore, it was expected that low-educated participants report more anxiety than those with higher education. Finally, it was hypothesised that unemployed participants show more anxiety than employed participants.

2. Method

2.1. Participants

Initially, 1089 participants aged from 18 to 88 were recruited between January 2020 and May 2021. The opportunity sample consisted largely of hospital staff and psychiatric patients. Participants were informed about the purpose of the study and the confidential treatment of their data. In addition, their right to withdraw from the study at any time was made clear to them and written informed consent was obtained prior to their participation. Ethical approval was granted by the medical faculty of the Ruhr-University Bochum (reference number: 2020.66) and the privacy right of human subjects was observed at all times. A total of 87 participants were excluded because of their response omissions (see data preparation section below). This resulted in a final sample of 1002 participants with a mean age of 40.49 years ($SD = 15.78$) and distribution of 652 women and 350 men.

2.2. Materials and Procedure

The study involved participants rating a range of statements determining their situational (state) and habitual (trait) anxiety, as well as their specific Covid-19-related-anxiety. In particular, participants completed the German version of the 40-item State-Trait Anxiety Inventory [12] to determine state and trait anxiety during the Covid-19 pandemic. Items included statements such as *I feel nervous* or *I feel down*. They also completed a 20-item Covid-19 anxiety measure, which was specifically designed for this study. It consisted of items such as *I get nervous and anxious when I think of the Corona pandemic* or *the pandemic burdens my psychological wellbeing*. All anxiety statements were rated on 4-point response scales with no neutral point (that is, no *zero*) and subsequently ranged from 1 = *not at all* to 4 = *strong disagreement*. Here, high total scores indicated high anxiety and vice versa. Participants received specific instructions to *only rate the state- and Covid-19-related anxiety statements in light of the pandemic*. The study was administered on paper and in German. Participants also completed a self-reported demographics section, determining the age, gender, education, employment status and four items about their psychological health, which was to identify whether participants had an existing mental illness (experimental group) or not (control group).

Data Preparation

First, the data were checked for missing values. Questionnaires containing missing data were excluded. The data were then transformed, following the State-Trait Anxiety Inventory manual (17 state-trait items had to be inverted). In particular, these items were not directed towards anxiety; therefore, they had to be reverse-scored (that is, scores worth *four* were transformed into *one*, scores worth *three* were transformed into *two*, scores worth *two* into *three* and a score worth *one* was transformed into *four*). Five Covid-19-anxiety items also had to be inverted (as they were also directed towards no anxiety), thereby following the same transformation principle as the State-Trait Anxiety Inventory. Next, total scores for each participant and each type of anxiety (state, trait, Covid-19) were calculated. These could range between 20 and 80, with low scores indicating little and high scores indicating more anxiety. Then, the data were checked for outliers and distribution.

It should be noted here that although the explorative analyses showed that the data were not normally distributed, no further transformation of the data was carried out because of the large sample and thus a normal distribution was assumed [13] [14] [15]. In addition, most analyses showed no homogeneity of variance within the data. This resulted in the interpretation of the more robust Welch test and, where applicable, the Games-Howell post-hoc test. Finally, reliability analyses revealed high internal consistency for state-anxiety $\alpha = 0.95$, trait-anxiety $\alpha = 0.93$ and Covid-19-anxiety $\alpha = 0.91$.

3. Results

The data was analysed using independent-samples t-tests and between subjects' ANOVAs. An independent-samples t-test is a parametric test that compares the performance of two unrelated groups, such as gender [16]. An ANOVA involves the analysis of variance and is able to compare the performance between more than two groups or conditions (for example, age, or at three or more different measuring points). In particular, by comparing the scores between the different groups, tells whether participants' performance differs significantly across these groups or conditions [16].

3.1. Anxiety and Mental Health

Participants ($N = 1002$) were divided into two groups: participants with an existing psychiatric diagnosis and participants without an existing diagnosis. There were no outliers according to inspection with a box plot. Data were not normally distributed for each group (Shapiro-Wilk test, $p < 0.001$) and there was no homogeneity of variance (Levene's test, $p < 0.001$). Independent-samples t-tests compared anxiety scores between both groups (for all of the descriptive statistics of this results section, see **Table 1** below). There was a significant difference in state-anxiety scores between the groups, showing that mean state-anxiety scores were 15.04 points (95%-CI [13.61, 16.47]) higher for the group with an existing

Table 1. Means and standard deviations of all anxiety measures across mental health status, gender, age, education and employment.

Variable	<i>n</i>	Anxiety Measure					
		State		Trait		Covid-19	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Psychiatric history							
With existing diagnoses	490	53.98	12.65	55.42	12.21	51.61	10.68
With no existing diagnoses	512	38.94	10.16	37.36	10.02	41.37	9.54
Gender							
Women	652	46.41	13.89	46.28	14.74	47.07	11.35
Men	350	46.07	13.33	46.15	14.13	45.10	11.19
Age							
18 - 29	332	45.73	12.70	47.45	13.67	46.49	11.43
30 - 59	556	47.54	14.28	46.43	14.75	47.04	11.58
60+	114	41.82	12.57	41.34	13.31	42.82	8.97
Educational Qualification							
Low education	28	56.07	11.58	54.82	10.53	52.57	11.19
SSC	140	50.00	13.40	50.39	14.77	48.06	11.49
GCSEs/O-levels	372	46.82	14.26	46.36	14.69	46.42	12.06
A-levels	288	45.01	13.18	45.16	13.94	46.18	10.59
University degree	174	42.74	12.35	42.78	13.11	44.27	10.32
Employment status							
Unemployed	271	50.66	13.63	52.40	13.83	49.42	11.11
Employed	731	44.67	13.37	43.89	13.82	45.25	11.09

mental illness compared to the group with no diagnosis, Welch's $t(937.24) = 20.69$, $p < 0.001$, $d = 1.31$. This pattern repeated itself for trait-anxiety, showing that mean scores were 18.06 points (95%-*CI* [16.67, 19.44]) higher, Welch's $t(946.13) = 25.53$, $p < 0.001$, $d = 1.62$. It also repeated itself for Covid-19-related anxiety, where mean scores were 10.24 points (95%-*CI* [8.98, 11.50]) higher, Welch's $t(976.24) = 15.98$, $p < 0.001$, $d = 1.01$. These results indicate that people with existing psychiatric diagnoses show more anxiety than people with no existing diagnoses in times of the Covid-19 pandemic indeed.

3.2. Anxiety and Gender

Participants were divided by gender ($N = 1002$). There were no outliers according to an inspection of the box plot. Data were not normally distributed for each group (Shapiro-Wilk test, $p < 0.001$) and there was homogeneity of variance

(Levene's test, $p > 0.05$). Independent-samples t-tests compared anxiety scores across gender. There was no significant difference between state-anxiety scores $t(1000) = 2.17$, $p = 0.711$, or trait-anxiety scores of female and male participants, $t(1000) = 1.06$, $p = 0.891$. There was however a significant difference in Covid-19-related anxiety scores, with women scoring on average 1.97 points (95%-CI [0.50, 3.40]) higher than men, $t(1000) = 1.26$, $p = 0.009$, $d = 0.17$. These results suggest that although women report more Covid-19-related anxiety than men during the pandemic, there are no gender differences in relation to general anxiety.

3.3. Anxiety and Age

Three one-way between-subject ANOVAs were conducted with age as the between-subjects factor and state- trait- or Covid-19-related anxiety as the dependent variables. Participants ($N = 1002$) were divided by age, resulting in three groups: 18 - 29 years, 30 - 59 years and over 60. There were no outliers, according to inspections of the box plots. Data were not normally distributed for each group (Shapiro-Wilk test, $p < 0.001$) and there was no homogeneity of variance for state- and Covid-19 anxiety (Levene's test, $p < 0.001$).

3.3.1. State Anxiety

Anxiety scores differed significantly between the different age groups, Welch's $F(2, 320.32) = 9.55$, $p < 0.001$, $\eta^2 = 0.02$. Games-Howell's post-hoc analysis revealed significant differences between state-anxiety scores of participants aged 18 - 29 and those aged over 60 ($p = 0.013$), and between participants aged 30 - 59 and those aged over 60 ($p < 0.001$). State-anxiety scores did not differ significantly between participants aged 18 - 29 and those aged 30 - 59 ($p = 0.123$). Mean state-anxiety scores decreased from participants aged 18 - 29 to those aged over 60 (3.91, 95%-CI [0.68, 7.14]), and from participants aged 30 - 59 to those aged over 60 (5.72, 95%-CI [2.59, 8.85]). These results indicate that although state-anxiety was lowest for participants aged over 60, it did not simply decrease with age. Instead, participants aged 30 - 59 indicated the highest level of state-anxiety, followed by those aged 18 - 29 and those aged over 60.

3.3.2. Trait Anxiety

Trait-anxiety scores differed also significantly between the different age groups, $F(2, 999) = 8.00$, $p < 0.001$, $\eta^2 = 0.02$. Games-Howell post-hoc analysis revealed significant differences between trait-anxiety scores of participants aged 18 - 29 and those aged over 60 ($p < 0.001$), and between participants aged 30 - 59 and those aged over 60 ($p < 0.001$). Trait-anxiety scores did not differ significantly between participants aged 18 - 29 and those aged 30 - 59 ($p = 0.548$). Mean trait-anxiety scores decreased from participants aged 18 - 29 to those aged over 60 (6.11, 95%-CI [2.68, 9.55]), and from participants aged 30 - 59 to those aged over 60 (5.09, 95%-CI [1.80, 8.39]). These results indicate that although trait-anxiety generally decreased with age, this decrease was for some age groups rather small.

3.3.3. Covid-19-Anxiety

Covid-19-anxiety scores differed too significantly between the different age groups, Welch's $F(2, 338.51) = 9.65, p < 0.001, \eta^2 = 0.01$. Games-Howell's post-hoc analysis revealed significant differences between Covid-19-anxiety scores of participants aged 18 - 29 and those aged over 60 ($p = 0.002$), and between participants aged 30 - 59 and those aged over 60 ($p < 0.001$). Covid-19-anxiety scores did not differ significantly between participants aged 18 - 29 and those aged 30 - 59 ($p = 0.771$). Mean Covid-19-anxiety scores decreased from participants aged 18 - 29 to those aged over 60 (3.68, 95%-CI [1.21, 6.15]), and from participants aged 30 - 59 to those aged over 60 (4.23, 95%-CI [1.93, 6.52]). These results indicate that although Covid-19-anxiety was lowest for participants aged over 60, it did not simply decrease with age. Instead, participants aged 30 - 59 indicated the highest level of state-anxiety, followed by those aged 18 - 29 and those aged over 60.

3.4. Anxiety and Education

Three one-way between-subject ANOVAs were conducted to assess the effects of education on anxiety (state-trait- or Covid-19-related). Participants were divided into five groups ($N = 1002$): low education, Secondary School Certificate (SSC), GCSEs/O-levels, A-levels and completion of an undergraduate/postgrad degree. There were no outliers, according to inspections of the boxplots.

3.4.1. State Anxiety

Data of the group with low education were normally distributed (Shapiro-Wilk test, $p < 0.001$) but not for the other groups (SSC, $p = 0.006$; GCSEs/O-levels, $p < 0.001$; A-levels, $p < 0.001$; university degree, $p < 0.001$). There was no homogeneity of variance (Levene's test, $p = 0.005$). State-anxiety scores differed significantly between participants' levels of education, Welch's $F(4, 172.65) = 11.87, p < 0.001, \eta^2 = 0.04$. Games-Howell post-hoc analysis revealed significant differences between state-anxiety scores of participants with low education and GCSEs/O-levels ($p = 0.003$), low education and A-levels ($p < 0.001$), low education and university degree ($p < 0.001$), SSC and A-levels ($p = 0.003$), SSC and university degree ($p < 0.001$), and GCSEs/O-levels and university degree ($p = 0.006$). State-anxiety scores did not differ significantly between participants with low education and those with an SSC ($p = 0.123$), SSC and GCSEs/O-levels ($p = 0.133$) and GCSEs/O-levels and A-levels ($p = 0.439$) and A-levels and university degree ($p = 0.337$). Mean state-anxiety scores decreased from participants with low education to those with GCSEs/O-levels (9.25, 95%-CI [2.54, 15.96]), from those with low education to those with an A-levels (11.06, 95%-CI [4.33, 17.80]), from those with low education to those with a university degree (13.34, 95%-CI [6.47, 20.21]), from those with an SSC to those with A-levels (4.99, 95%-CI [1.22, 8.76]), from participants with an SSC to those with a university degree (7.26, 95%-CI [3.23, 11.30]), and from those with GCSEs/O-levels to those with a university degree (4.09, 95%-CI [0.82, 7.36]). These results all indicate that state-anxiety

did indeed decrease with education. Overall, these results reveal that age is not a straightforward variable to predict anxiety. Whilst it can be said that the oldest participants showed indeed the least anxiety (state, trait, Covid-19), participants aged 30 - 59 showed greater anxiety than those aged 18 - 29, thus not following the predicted trend.

3.4.2. Trait Anxiety

Here, data of the group with low education were normally distributed (Shapiro-Wilk test, $p > 0.05$) but not for the other groups (SSC, $p = 0.001$; GCSEs/O-levels, $p < 0.001$; A-levels, $p < 0.001$; university degree, $p < 0.001$). There was no homogeneity of variance (Levene's test, $p = 0.002$). Trait-anxiety scores differed significantly between participants' levels of education, Welch's $F(4, 175.33) = 10.75$, $p < 0.001$, $\eta^2 = 0.03$. Games-Howell post-hoc analysis revealed significant differences between trait-anxiety scores of participants with low education and GCSEs/O-levels ($p = 0.003$), low education and A-levels ($p < 0.001$), low education and a university degree ($p < 0.001$), SSC and GCSEs/O-levels ($p < 0.050$), SSC and A-levels ($p = 0.005$), SSC and university degree ($p < 0.001$), and GCSEs/O-levels and a university degree ($p = 0.036$). Trait-anxiety scores did not differ significantly between participants with low education and an SSC ($p = 0.336$), GCSEs/O-levels and A-levels ($p = 0.818$) and A-levels and university degree ($p = 0.351$). Mean state-anxiety scores decreased from participants with low education to those with GCSEs/O-levels (8.46, 95%-CI [2.34, 14.58]), from those with low education to those with an A-levels (9.67, 95%-CI [3.49, 15.84]), from those with low education to those with a university degree (12.04, 95%-CI [5.70, 18.38]), from those with an SSC to those with GCSEs/O-levels (4.02, 95%-CI [0.00, 8.04]), from participants with an SSC to those with an A-levels (5.23, 95%-CI [1.12, 9.33]), from those with an SSC to those with a university degree (7.60, 95%-CI [3.22, 11.99]), and from participants with GCSEs/O-levels to those with a university degree (3.58, 95%-CI [0.15, 7.01]). Overall, these results indicate that trait-anxiety also decreased with education.

3.4.3. Covid-19-Anxiety

Again, data of the group with low education were normally distributed (Shapiro-Wilk test, $p > 0.05$) but not for the other groups (SSC, $p = 0.002$; GCSEs/O-levels, $p < 0.001$; A-levels, $p < 0.001$; university degree, $p < 0.001$). There was no homogeneity of variance (Levene's test, $p = 0.008$). Covid-19-anxiety scores differed significantly between participants' levels of education, Welch's $F(4, 170.33) = 4.66$, $p < 0.001$, $\eta^2 = 0.02$. Games-Howell post-hoc analysis revealed significant differences between Covid-19-anxiety scores of participants with low education and A-levels ($p = 0.049$), low education and university degree ($p < 0.007$), and SSC and university degree ($p = 0.022$). Covid-19-anxiety scores did not differ significantly between participants with low education and SSC ($p = 0.314$), low education and GCSEs/O-levels ($p = 0.063$), SSC and GCSEs/O-levels ($p = 0.617$), SSC and A-levels ($p = 0.484$), GCSEs/O-levels and A-levels ($p = 0.999$) and A-levels

and university degree ($p = 0.313$). Mean state-anxiety scores decreased from participants with low education to those with an A-levels (8.39, 95%-*CI* [0.02, 12.76]), from those with low education to those with a university degree (8.30, 95%-*CI* [1.82, 14.79]), and from those with an SSC to those with a university degree (3.79, 95%-*CI* [0.36, 7.21]). These results indicate that Covid-19-related anxiety decreased with increased education.

3.5. Anxiety and Employment

Participants ($N = 1002$) were divided by employment status, leaving two groups: employed and unemployed. The data of both groups were not normally distributed, as assessed by the Shapiro-Wilk test ($p < 0.001$) and there were no outliers in the data. Independent-samples t-tests compared anxiety scores between both groups. There was a significant difference between state-anxiety scores in relation to participants' employment status, with unemployed participants scoring on average 5.99 points (95%-*CI* [4.09, 7.88]) higher than employed participants, Welch's $t(474.61) = 6.21$, $p < 0.001$, $d = 0.45$. This trend was also found for trait-anxiety, where unemployed participants scored on average 8.65 points (95%-*CI* [6.58, 10.44]) higher than employed participants, $t(481.27) = 8.64$, $p < 0.001$, $d = 0.62$, and for Covid-19 related anxiety. Here, unemployed participants scored on average 4.17 points (95%-*CI* [2.61, 5.73]) higher than employed participants, $t(469.59) = 5.17$, $p < 0.001$, $d = 0.37$. These results indicate that employment was predictive of anxiety (state, trait and Covid-19). In particular, unemployed participants reported greater anxiety than those in employment.

Taken together, these results show that education was predictive of anxiety. Specifically, the higher the level of education, the lower the level of reported (state, trait and Covid-19) anxiety.

4. Discussion

It has become clear over the past two years that the Covid-19 pandemic continues to impact majorly on people's lives worldwide. Whilst those who become infected suffer from its' potentially severe health impairments and consequences; many may also suffer psychologically from the social restrictions put in place. As a result, existing psychological symptoms, such as anxiety and/or depression could be amplified. This study firstly aimed to explore the impact of the Covid-19 pandemic on peoples' mental health, specifically, comparing levels of anxiety between people with and without pre-existing mental health conditions (that is, generalised anxiety disorder and/or depression).

Results confirm that participants with pre-existing mental health conditions experience more anxiety during the Covid-19 pandemic than those without. In particular, participants with a prior psychiatric history reported higher levels of state-, trait- and Covid-19-anxiety compared to those without. These findings also fit within existing research identifying people with prior psychiatric histories as most vulnerable to negative mental problems following an epidemic [5]

and show more psychological distress [6]. They are also one of the first to highlight the differences in felt anxiety between people with and without pre-existing mental health conditions in light of the Covid-19 pandemic and could thus help to deliver more efficient treatment for predisposed vulnerable individuals during future outbreaks and/or other pandemics.

This study's secondary aim was to assess whether gender, age, educational- and employment-status could be predictive of anxiety in light of the Covid-19 pandemic. This was to identify other most vulnerable individuals and groups during the Covid-19 pandemic. Results showed that gender was predictive of Covid-19-related anxiety but not of state- or trait- anxiety. Specifically, women reported more Covid-19-related anxiety than men, which fits into existing research [7] [8] [9]. These results also fit within the contrary existing research, which found no gender differences [11] [12]. It was suggested that an absence of gender differences in felt anxiety during the pandemic might be explained by increased familial strain on both men and women, because of the lockdowns [7]. Specifically, due to school and nursery closures, parents had to organise their (work-)lives around childcare and home-schooling, as well as attend to their children's social, emotional and physical needs.

Interestingly and contrary to prediction and previous research [3] [5] [17] participants over 60 consistently reported the lowest levels of anxiety (state-trait- Covid-19). They also contradict previous research reporting high levels of anxiety and stress in younger participants [6] [18]. Instead, there were no observable trends for the other two (younger) age groups. The middle-aged group (ages 30 - 59) showed the highest levels of state- and Covid-19-anxiety and trait-anxiety decreased with age. There are some similar findings of middle-aged participants showing the highest effects of stress resulting from naturally occurring hazards [19]. This was explained by participants' multiple roles and responsibilities. Age was therefore only partially predictive of anxiety in light of the Covid-19 pandemic.

One reason for these findings might be that older people have developed more resilience than younger people [6]. In particular, whilst younger people might have felt increased financial distress during the pandemic, a factor associated with increased anxiety and depression, namely, the life experience of older people [6] might have prevented them from such fears.

In addition, the sample consisted of one-half of psychiatric patients and therefore, age-specific risk and protective factors identified by previous research determining them within the general public might not match the participant sample of this study.

The results also showed that low education and unemployment were indeed predictive of increased anxiety during the Covid-19 pandemic. Specifically, those with low education reported the highest levels of anxiety (state- trait- and Covid-19) and those with high education the lowest. In addition, those without employment showed greater anxiety than those in employment. Being employed may have prevented people from financial strain, as well as providing certain

necessary daily routines and thereby might prevent increased dwelling on the negative restrictions of the pandemic. In addition, it might have served to stop people from feeling overly isolated, as they are able to interact with colleagues online (home-office) or at work. Yet, there are also findings showing that certain jobs with close contact with patients (for example, midwifery) can increase Covid-19 related-anxiety [20]. Taken together, these findings fit into existing research [5] [17] and, by identifying those with the greatest risk of poor mental health, could further help to shape intervention and support programs effectively during the current and/or future pandemic(s).

Limitations

As with most research, there are a number of limitations to this study. First, whilst reliability analysis showed high internal consistency for the Covid-19-anxiety scale, no other validation process was carried out prior to its' administration. Consequently, its external consistency remains uncertain. In addition, it remains unclear into which specific dimensions of anxiety in relation to Covid-19 the scale taps. Consequently, the scale might only address some aspects of anxiety and therefore might indicate different (that is, lower) levels of anxiety than respondents actually hold. Yet, given there was no existing scale measuring anxiety in relation to Covid-19 at the start of the data collection process the Covid-19-anxiety scale might present a useful and expandable tool in the future.

Second, one may argue that the participant sample of the control group was rather "specific" as it consisted predominantly of hospital staff. Specifically, it could be argued that health care professionals might show higher levels of anxiety in relation to Covid-19 than the population at large, given their risk of potentially becoming infected or infecting others with the virus or their concerns of shortages of personal protective equipment [21].

Third, this study did not screen for whether participants had either been infected with or vaccinated against, the Covid-19 virus prior to their participation. Whilst there was no vaccine at the start of the data collection process, this lack of information could still have influenced participants' responses. In particular, participants who had already recovered from the infection might have indicated lower levels of anxiety than those who had not been infected or vaccinated. Alternatively, and depending on the difficulty of the course of the disease, it is possible that recovered participants might have reported higher levels of anxiety compared to those who had not yet been infected or vaccinated.

Fourth, this study did not screen for whether those in employment work from home or not. Consequently, it remains uncertain exactly why those in employment showed lower levels of anxiety than those without employment during the Covid-19 pandemic. For instance, people in employment may have had to work from home instead of their usual workplace, which reduced daily socialising, and thus perceived the risk of getting infected with the virus. In addition, those being able to work from home during the pandemic may actually have liked to work from home and therefore felt less strain compared to unemployed people. Al-

ternatively, the pandemic may have caused people's unemployment, which in turn might have led to financial insecurity and thus could have increased their felt anxiety [3]. In addition, those without work may have had pre-existing health conditions preventing them from working. Such conditions have already been identified to cause more vulnerability and make people more susceptible to social and economic stress during the pandemic [3]. Yet, this study did not screen for existing medical conditions other than anxiety and depression.

5. Conclusion

The overall aim of the study discussed above was to determine differences in the impact of the Covid-19 pandemic on levels of anxiety (state, trait and Covid-19) between psychologically predisposed and healthy participants. It also explored the predictability of gender, age, education and employment status on increased anxiety during the pandemic. Predisposed participants showed consistently more anxiety than healthy people, thus highlighting their increased need for mental health support during the present or future pandemic(s). In addition, whilst low education and unemployment were predictive of increased anxiety, both gender and age were only partially predictive of increased anxiety. The results of this study could help our management and support current and future pandemics. Although the Covid-19-anxiety scale used in this study had not undergone the entire process of validation, it showed a high internal consistency and thus might present a useful measure of anxiety towards Covid-19 in the future.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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