The effects of loneliness and stress on healthcare workers (HCWs) due to Covid-19.

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Abstract

In resent years from the end of 2019 to current time the world has came to a standstill over a global pandemic which is upturning lives. This study aimed to create a better understanding for two main aspects healthcare workers have been suffering from. The research is expanding on previous literature and knowledge to determine if levels of loneliness and levels of stress have increased for healthcare workers due to Covid-19. The were three main research questions presented alongside three hypotheses. The hypothesises were that HCWs would score high on the UCLA questionnaire, that there will be a relationship between self-reported stress and loneliness and third that their will be an increase in levels of stress due to high levels of loneliness. For this study participant were recruited through social media platforms using convenient snowball sampling and received a total of 90 participants. Participants were asked to complete a demographic questionnaire which entailed their age, highest degree of schooling, employment type etc. The participant could proceed on and complete the Perceived Stress Questionnaire (PSQ) and the University of Los Angeles version 3 Questionnaire (UCLA VS3). Results from the present study were obtained from a non- parametric Spearman's Correlation and Standard Multiple Regression. The current research suggests that according to previous research HCWs levels of both aspects (Loneliness and Stress) are significantly increased due to Covid-19. Implications, strengths, and limitations are discussed in relation to this current study.

Table of Contents

Literature Review

A healthcare worker (HCW) is an individual who delivers care to people in a vulnerable state whether it is physical or emotional pain, mental health, or psychological issues. Providing HCW's with the education and resources is the key factor (Ott & Wirick , 2008). HCW's play a vital role in the healthcare system today more than ever with a global pandemic (Covid-19). Covid-19 is belonged to a family called betacoronaviruses which causes respiratory infections that resemble a cold with symptoms of a cough or temperature (Tufan , Guler, & Matucci-Cerinic, 2020). It has put an immense amount of pressure on HCW's leaving them to make tough decisions daily while juggling their own personal life and health. Challenging decisions due to restrictions and telling families they are not able to visit their loved ones. This leaves an emotional and psychological impact on HCW's. Previous research has examined moral injury (MI) and how it is considered an army term which is used to describe psychological distress (Greenberg, Docherty, Gnanapragasam, & Wessely, 2020). Individuals who suffer from moral injury are more inclined to experience negative self-thoughts which can lead to depression, post-traumatic stress disorder (PTSD), and suicide. However, research suggests moral injury has emerged in HCW's due to covid-19 and the challenges that comes with the pandemic. MI is considered an emotional wound for those who witness intense human suffering and that is what HCW's experience daily in hospitals and nursing homes (Cartolovni , Stolt , Scott , & Suhonen , Moral injury in healthcare professionals: a scoping review and discussion, 2021). The term moral injury is born in the PTSD context and in recent years has been recognized to affect healthcare professionals (Cartolovni , Stolt , Scott , & Suhonen, Moral injury in healthcare professionals: A scoping review and discussion, 2021).

PTSD is one of the most popular signs of exposure to trauma, recently HCW's are exposed to trauma due to Covid-19. Recent findings suggest that infectious disease and pandemics can

cause a highly traumatic experience leading to PTSD, chronic psychological distress (Boyraz & Legros , 2020),PTSD (Boyraz & Legros , 2020), and burn-out syndrome (BOS) (Embriaco, Papazian , Kentish-Barnes , Pochard, & Azoulay, 2007). BOS is a psychological state which occurs due to drawn-out exposure to a stressor, it was recognised in the 1970's from exhaustion and the inability to cope with emotional stress leaving no time to recover/recuperate (Embriaco, Papazian , Kentish-Barnes , Pochard, & Azoulay, 2007). BOS has a variety of negative consequences including depression, a detached feeling, decreased personal accomplishment however, with Covid-19 burnout relates to physical and mental exhaustion (Dimitriu, et al., 2020). As Covid-19 cases increase and more people are being admitted to hospitals or intensive care units (ICU) this has led to heart wrenching sights for HCW's. There is a variety of aspects that combine to contribute towards physical, mental, emotional, social, and psychological issues individuals suffer from since the pandemic began. The Covid-19 pandemic has been classified as a traumatic event with the experience of sickness and death by HCW's. These aspects can lead to acute stress disorder (ASD), ASD is an anxious response to a traumatic event with symptoms like negative mood, sleep difficulties, inattention etc. (Banfante , Di Tella , Romeo, & Castelli, 2020) consider traumatic stress to be a psychological impact due to Covid-19. Women, nurses, and those working in Wuhan where the virus originated from are suffering from more severe trauma, stress, anxiety, and depression and since Wuhan have been dealing with the response of Covid-19 long before the rest of the world. The healthcare professionals in Wuhan are sleep deprived and suffering from BOS (Benfante , Di Tella , Romeo , & Castelli , 2020). As HCW's worldwide are feeling all the psychological and emotional factors coming their way and there is an increase of stress and loneliness due to HCW's isolating themselves to protect family and fearing the guilt it will bring if they infect another person (Banfante , Di Tella , Romeo, & Castelli, 2020).

There is a countless number of doctors, nurses, healthcare assistants etc worldwide who are all considered to be HCW's. Some HCW's are at the beginning of their journey and others are in the health industry for decades but all ages are susceptible to COVID-19. The physical and emotional well- being of healthcare staff is being tested daily by the increase in cases, Covid-19 has caused a significant strain on HCW's (Ripp, Peccoralo , & Charney , 2020), (Chew , et al., 2020). The effect of this increase in a HCW's workload is considered a "dangerous atmosphere". The mental health needs must be addressed for HCW's and be made a priority. The enormous amount of pressure and worry of infecting a family member is leaving HCW's in a constant state of psychological stress (de Pablo , et al., 2020), (Cabarkapa, Nadjidai, Murgier, & Ng, 2020), (Xing, et al., 2020). This worldwide threat has fostered fear among healthcare workers and will continue to do so until it is no longer a threat (Ehrlich , McKenney, & Elkbuli, 2020)

According to (Bielicki, et al., 2020) HCW's are at an increase of developing Covid-19 due to working closely to it and an increase of developing mental health issues. The staff are exposed to patients, patients' family members, and colleagues which all leads to active transmission unless people take the correct precautions. Covid-19 has affected more than 200 countries worldwide and is still increasing in some countries with new symptoms such as respiratory distress. Covid-19 is easily transmitted through droplet transmission, with cases increasing so has the mortality rate in each country. By understanding the virus, its shedding duration and incubation period specialists have been able to create an isolation quarantine (Peng, 2020). The quarantine period is saving lives while decreasing the risk of cases however, it plays a huge role in the decrease of HCW's mental health.

Loneliness

Loneliness is defined as a person's perception of being alone and isolated, it is their state of mind (Tiwari , 2013). Loneliness is considered when an individual lacks all communication

with other people and this is regarded as a disconnection, which can lead to anxiety and depression (Cacioppo & Hawkley, 2009). Loneliness is also acknowledged as feeling unwanted or not cared for by the people who surround you. Before covid-19 loneliness was still an ongoing public health issue and since lockdown's and outbreaks these two factors contribute to the increase in loneliness (Luchetti , et al., 2020). Suffering from loneliness can leave an individual exhausted and overwhelmed with negative emotions and thoughts, this has been proven in the past and can lead to impaired quality of life and mortality (Tilvis , Laitala, Routasalo, & Pitkala, 2011). Quarantine was introduced in 2003 when the outbreak of SARS happened which left people alone and those same people now experience mental health issues including stress, anxiety, and depression (Brooks, et al., 2020). Loneliness has severely affected people's mental health and physical health due to the pandemic. In agreement with (Matthews, et al., 2016) social relationships are a basic need for human. Since December 2019 our acknowledgement to the first case of Covid-19 in Ireland it has immediately spread with cases doubling each week. As previously stated, this is not the first time in the world a worldwide crisis has happened as there is previous research proving HCW's that suffer from anxiety, depression, and fear due to these circumstances (Chong, et al., 2004). Loneliness due to Covid-19 is leaving HCW's struggling and feeling like they have no psychological or physical support system (Geoffroy , et al., 2020).

As stated by (Huremovic , 2019) HCW's bear a psychological and emotional brunt of isolation, quarantine, and loneliness. While lockdown and quarantines mean the same for everybody there is some aspects that are different for the healthcare staff. HCW's still must provide care while cut off from their loved ones. Covid-19 is classifiable as a traumatic event with exposure to death in which HCW's observe every day (Benfante , Di Tella , Romeo , & Castelli , 2020). A study was conducted which resulted in 11% of HCW's had developed stress-reaction symptoms like anxiety and depression from being involved in an event like Covid-19

(Mak, Chu, Pan, Yiu, & Chan, 2009). The main HCW's affected were the ones who had longer shifts from a shortage of staff and for a prolonged period where on the specialized units. Loneliness is a very strong emotion and can affect people in all sorts of ways.

As Covid-19 is still currently happening we cannot state what the effects on HCW's will be but according to research after the SARS outbreak healthcare staff suffered from depressive thoughts, psychological distress, constant state of fear, overthinking and PTSD. Much like the outbreak Covid-19 there was a previous outbreak of SARS, this led HCW's suffering through workplace exposure similar enough to what is happening again (Maunder, et al., 2003). A systematic review was conducted in 2019 to investigate the impact of SARS-Co-V-2 on mental health on HCW's. The results showed there was a total of 69,499 participants, with an outcome of six mental health outcomes (Depression=13.5%, Anxiety= 12.3% - 35.6%, Acute stress reaction=5.2%-32.9%, PTSD=7.4%-37.4%, Insomnia=33.8%-36.1%, and Occupational burnout=3.1%-43.0%) (Sanghera , et al., 2020). All six of the outcomes is what HCW's today will suffer again due to Covid-19. The stress and loneliness this pandemic has caused is tremendous.

Stress

Stress is also something all humans and animals feel except we deal with it in a different way. For us humans our heart begins to race, palms get sweaty, adrenaline floods and in some cases we freeze. Stress is considered a physical and mental state in a stressful situation, one which our body and mind takes over to respond quickly. According to (Foley & Kirschbaum, 2010) humans signal their brain with an environmental cue that they are beginning to stress. The hypothalamus pituitary adrenal (HPA) axis wakes the pituitary to release hormones that travel to the adrenal gland which releases cortisol. Cortisol is the main stress hormone and acts like a defence mechanism. All of this then triggers the amygdala to activate and act like a survival mechanism which is connected to the pre-frontal cortex (PFC). Both balances an

individual's thoughts in a stressful situation. As HCW's are constantly on high alert they have a normal amount of stress triggered at any giving time but now with covid-19 the stress has overwhelmed many HCW's all over the world. With isolation and stress, home confinement is a HCW's daily routine which is raising concern for today's generation and the future generations (Pfefferbaum & North , 2020).

According to (Lenzo , Quattropani , Sardella, Martino, & Bonanno, Depression, anxiety, and stress among healthcare workers during the COVID-19 outbreak and relationships with expressive flexibility and context sensitivity, 2021) HCW's today are suffering from depression, anxiety, and prolonged stress, they are continuously facing unbearable sights with infected patients while their own life is on the line. Being isolated from the community leads to an individual suffering alone which can lead them to an increase in stress levels. Feeling like the world is going on while you are stuck alone. (Lenzo , Quattropani , Sardella, Martino, & Bonanno, Depression, anxiety, and stress among healthcare workers during the COVID-19 outbreak and relationships with expressive flexibility and context sensitivity, 2021) also states that in 2003 when there was a SARS outbreak there was a 5%-10% increase in HCW's struggling with PTSD. A recent study by (Lai , et al., 2020) showed evidence that 1,257 Chinese HCW's suffered from depression (50.4%), anxiety (44.6%), and the highest was 71.5% for distress in Wuhan.

The current study

The final year project being proposed is "The effects of loneliness and stress on healthcare workers due to Covid-19". The main topic is surrounding the mental state of mind and well-being rather than just the physical strain on HCW's. Due to previous research examining the negative effects that loneliness and prolonged stress has on an induvial the researcher has decided to make these two aspects the main part of this project. Research in the past has shown that loneliness and stress individually are not to be taking lightly when it comes to an

individual's mental health. With current and past research combined if there are common factors to mental and physical health then new interventions can be introduced for future HCWs. However, this will be the first study to examine both aspects together rather than individually or with different aspects such as stress and depression (Knoll & Carlezon Jr, 2010) (Salari, et al., 2020) or loneliness and anxiety (Shechter , et al., 2020). As this is the first study to look at both aspects the results can contribute to further psychological studies and can provide a way to increase HCWs performance while considering their mental and physical health. The reason for the study being conducted is to examine why individuals suffer from loneliness and stress, the consequences left in Covid-19's wake and using the data collected exploring what can be done to prevent the two aspects being so major in the future. The primary aim of this proposal is to provide a greater understanding of the role loneliness and stress play on HCW's during a pandemic by conducting two surveys (Perceived Stress Questionnaire and The University of California Los Angeles).

The research questions (RQ) proposed are -

(1) The effect of loneliness on HCW's due to Covid-19. The hypothesis proposed for RQ1 is that - healthcare workers working during Covid-19 will score high on the loneliness scale (UCLA LS3).

(2) Is there a relationship between self-reported stress and levels of loneliness in HCW's? The hypothesis proposed for RQ2 is that - there will be a relationship between self-reported stress and levels of loneliness in HCW's.

(3) Does loneliness and employment type (i.e., full-time, part-time, etc) predict stress in HCW's? The hypothesis for RQ3 is that - there will be an increase in levels of stress due to higher levels of loneliness.

Methodology

Participants

Participants were recruited using a convenient snowball sampling technique. A description and a link to the study was made public using social media platforms such as Facebook, Instagram, Snapchat, and LinkedIn. As participants took part in the study it was encouraged to forward it to their fellow social circle or family who worked in the healthcare profession. The current research sample consisted of 90 participants (n=90). There originally was a total of 96 participants of which six participants were excluded due to four not being healthcare workers and two not giving consent to take part in the study. The eligibility criteria for this study were each participant had to be a healthcare worker over the age of 18 who has worked throughout Covid-19. After the information form was read, all participants were required to read and tick the box confirming they give consent to take part in the study and for their data to be used. The study was made up of female (n=76), male (n=13), and prefer not to say (n=1). The average age for the study was 33.92, standard deviation (13.40), and mean (33.92) Participant's ethnicity was considered with the highest category being White/Caucasian (n=71). Education was a factor participant were asked to answer with the highest category being a bachelor's degree (n=36). Participant were asked about their form of employment, full time (n=47), part-time (n=29), and student (n=11), they were the three highest categories. The last two categories for participants were marital status and if they were a healthcare worker. For marital status single was the highest category (n=46), followed by married (n=25), and lastly in a domestic partnership (n=19). It was compulsory to be a healthcare worker to be involved with the study.

Design

The research design for this current study was conducted using a quantitative research approach which is considered the process of collecting data and analysing it. It is based on forming relationship within or between two concepts or more. This study used two questionnaires to obtain data. For this study it was a within participant design. The predictor variables for this study were age, gender, ethnicity, highest degree of school completed, employment and marital status. The independent variable was stress while the dependent variable was loneliness. For the second research question a spearman's correlation was run using SPSS, and for the third research question a standard multiple regression was run using SPSS. The third research question contained two predictor variable (PV's) – Total UCLA and current employment. The criterion variable (CV) was Total PSQ.

Materials/ Measure

All participant that took part in a demographic questionnaire which included age, gender, ethnicity, highest degree of school completed, employment status and marital status. Following this was the two main questionnaire which examined loneliness levels and self-reported stress levels.

The Perceived Stress Questionnaire (PSQ). This questionnaire was used to measure a participant's level of stress by measuring it using a Four-Point Linkert Scale viewing as (1) almost (2) sometimes (3) often (4) usually. The 30-item scale is a self-report questionnaire. Each answer giving by the participant is to personally reflect on the individual. The duration of completing the total study would be 10-15 minutes approximately. For this questionnaire scoring is calculated by tallying up each item/answer and once you receive the total score, known as the "raw score" the researcher will minus 30 from it. The result answer you receive from that you must divide by 90 which leaves you with a score between 0-1. Higher scores

from the PSQ indicated greater levels of stress while lower score is related to lower levels of stress.

The University City of Los Angeles version-3 (UCLA LS3). This questionnaire was used to examine a participant's levels of loneliness. This questionnaire is made up of 20 items (9 positively worded and 11 negatively worded) which the individuals answer to reflect themselves. UCLA LS3 is used to indicate how an individual feels using the Four-Point Linker scale (O = often, S= sometimes, R= rarely, N= never). The scoring for the UCLA LS3 is tallying the answer together for your result however, the 9 positive questions (questions 1, 5,6,9,10,15,16,19,20) are reversed scored (1=4, 2=3, 3=2, 4=1). Higher scores from the UCLA LS3 indicates a greater degree of loneliness. The scores are ranged between 20-80 with 20-34 indicating low- level loneliness, 35-48 indicating medium- level loneliness and 49-80 indicating high-level loneliness. The equipment used for this study was an ASUS laptop, with software such as google forms and SPSS.

The Cronbach's alpha coefficients reported at .76 which is considered acceptable. All values in the Inter-Item correlation matrix showed positive for the study. The mean- inter item correlation resulted a .61. Both scales of measurement in previous studies appear reliable

Procedure

The data for this study was collected through a Google Forms Survey. The survey was used as an example prior to commencement for five participants so the researcher could take back feedback, how long it took, any misunderstanding of a questionnaire or section. There data was then deleted before the release so there would be no complications with the data collected from participants. Once it was all set to be released it was made public on social media platforms such as Facebook, Instagram, Snapchat, and LinkedIn. The survey takes a total of 10- 15 minutes approximately to complete and must be read carefully. It was

encouraged for participants to forward the study to eligible participants to take part. The first section participants viewed was the Information Sheet (Appendix A) which detailed the title of the study, why the researcher was conducting this study, if they can withdraw from the study at any time, what is done with their data collected, is the data public or private, what the risks where and if they would be affected by the study. From reading the information sheet participant can voluntarily decide if they would like to take part. It is stated that the data collected will be anonymous and unidentifiable so once the data is received it cannot be withdrawn.

Moving on in the link was the Consent Form (Appendix B). By giving consent these participants could take part in the research. It was made clear that the study was voluntary, and their data collected would be kept confidential. Then participants were asked to tick a box of weather they consent or do not consent. Participants must be over the age of 18 to take part in the study. They must also be a healthcare worker who has worked through Covid-19. The next section was the participants Demographic Questions (Appendix C). The questions focused on age, gender, ethnicity, highest degree, or level of school completed, employment, marital status and if they were a healthcare worker. This section was made mandatory for participant, and they could not go forward with the link until each question was answered.

Then participant went to the next section in the link which was the Perceived Stress Questionnaire (Appendix D). Participants answered each question to reflect on them. PSQ is a self-report questionnaire with 30-items. The next questionnaire was the University City of Los Angeles version 3 (UCLA LS3) (Appendix E). Much like the PSQ, participants answered questions that reflected on themselves. UCLA LS3 is another self-report questionnaire which is made up of 20-items.

The final page entailed the Debriefing Sheet (Appendix F) expressing the researcher gratitude to participants for taking part in the study. It also entailed help lines and centres they can attend or ring if participants feel they have been affected by this study. Contact information for the researcher's supervisor and the researcher themselves was provided. Therefore, contact information is provided along with help lines and centres for support. The study was conducted using the Psychology Society of Ireland (PSI) Code of Ethics and National College of Ireland Code of Ethics. It was granted permission to continue research after the proposal by the National College of Ireland Ethics Committee.

Results

Descriptive Statistics

Descriptive statistics were performed for all the categorical data first, this included gender, ethnicity, highest school degree, employment, marital status, and health care worker status. The frequency and valid percentage were displayed in Table 1. From the output we know in this current study there is 13 males (14.4%), 76 female (84.4%) and prefer not to say (1.1%) giving a total of 90 participants from the gender section. The results show White/ Caucasian was the highest ethnicity with 78.9% (N = 71) and the highest degree of schooling was a bachelor's degree with 40.0% (N = 36). Full time employment was the highest in current employment with 52.2% (N = 47) and finally single was the highest category in marital status explaining 51.1% (N = 46). The last question was to address if participants where a healthcare worker in which all 89 participants answered yes (100%).

Table 1: Descriptive statistics for all categorical variables – gender, ethnicity, highest degree of school, employment, marital status, and are you a healthcare worker.

	Variable	Frequency	Valid %
Gender			
	Male	13	14.4%
	Female	76	84.4%
	Prefer not to say	1	1.1%
Ethnicity		71	78.9%
	White / Caucasian	4	4.4%
	Hispanic / Latino	5	5.6%
	Black / African American	7	7.8%

Asian / Pacific Islander White / Caribbean Black	1	1.1%
Malawian	1	1.1%
Do not think it matters	1	1.1%
Highest degree of school		
Junior Certificate	4	4.4%
Leaving Certificate	9	10.0%
Post Leaving Certificate	26	28.9%
Bachelor's degree	36	40.0%
Master's degree	12	13.3%
Diploma	2	2.2%
Laboratory Assistant	1	1.1%
Employment		
Full time	47	52.2%
Part-time	29	32.2%
Unemployed looking for a job	1	1.1%
Unemployed not looking for a job	2	2.2%
Student	11	12.2%
Marital Status		
Single	46	51.1%
Married	25	27.8
Domestic Relationship	19	21.1%
Are you a healthcare worker		
Yes	90	100.0%

Descriptive statistics were performed for the continuous variables next, and this included age, Total PSQ, Total UCLA. The mean (M), standard deviation (SD) and minimum and maximum (Min-Max) was recorded for the continuous variables in Table 2. Age was the first variable and results from the output explained (M = 33.92, SD = 13.48, Min-Max = 20-65), Total PSQ was the following variable and results explained (M = 74.11, SD = 12.20, Min-Max = 50-98), and finally the last variable being Total UCLA results explained (M = 47.26, SD = 11.54, Min-Max = 23-70).

Table 2: Descriptive statistics for all continuous variables – age, Total PSQ, Total UCLA

Variable	*M* [95% CI]	*SD*	Min-Max
Age	33.92 [31.10-36.75]	13.48	20-65
Total PSQ	74.11[71.56-76.67]	12.20	50-98
Total UCLA	47.26 [44.84-49.67]	11.54	23-70

Inferential Statistics

Research question 1

For research question 1 the researcher can see by using the descriptive analysis that the Total UCLA mean is 47.26 (M=47.26). In comparison to other studies the participants in this current study are at a medium range level of loneliness. According to (Ju, et al., 2022) scores are ranged between 20-80 with 20-34 indicating low- level loneliness, 35-48 indicating medium- level loneliness and 49-80 indicating high-level loneliness. According to the cut off the participants in the current study are medium- level loneliness but are borderline to high-level loneliness.

Research Question 2

For research question 2 a non- parametric Spearman's Correlation coefficient analysis was run. The relationship between self-reported stress and levels of loneliness was investigated using a Spearman's product moment correlation coefficient. Preliminary analyses were performed to ensure there was no violation of assumptions between normality, linearity, and homoscedasticity. The results concluded there was a positive spearman value ($n = 90$, $rho = .63$, $p < .001$). This indicates a strong positive relationship between self- reported stress and levels of loneliness, results represent a large correlation between the two variables (above .6) Both variables show a 36% shared variance. Both variables in the model were found to be statistically significant ($p < 001$).

Table 3: Spearman's correlation – Total PSQ and Total UCLA

Variable	1.	2.
1. Total PSQ	1	
2. Total UCLA	.63	1

Research Question 3

For research question 3 a Standard Multiple Regression was used to investigate the impact of employment and loneliness on levels of stress. Preliminary analyses were conducted to ensure no violation of assumption of normality, linearity, multicollinearity, and homoscedasticity. The model explained 38% of the variance in Total UCLA and employment ($f(2,87) = 26.65$, $p < .001$). By examining the coefficients table, the standardised beta value indicate employment has the highest beta value (beta = .950, p = .229) followed by the beta value of Total UCLA (beta = .089, $p < .001$). From examining the anova table from the output one of the predictor variables (Total_UCLA) showed to be statistically significant ($p < .001$). Tests for multicollinearity explained Tolerance (.994) and VIF (1.01) for employment and Total UCLA.

Table 4: Standard Multiple Regression.

Variable	R^2	B	SE	β	*t*	*p*
Model	.38					
Total UCLA		.63	.18	.60	7.18	.000
Current employment		.95	.79	.10	1.21	.229

Additionally, the researcher examined the test of normality using Kolmogorov-Smirnov, age was the only variable out of the three to show statistically significant ($p < .001$). However, from examining the histogram and Q-Q Plot for the other two variables (loneliness and stress) they show that they are reasonably normally distributed with most of the scores occurring in the centre viewing as a bell curve.

Discussion

The current study aimed to investigate weather healthcare workers are suffering from loneliness and stress due to Covid-19. Previous research was taking into account surrounding levels of loneliness and levels of stress prior to Covid-19. Results from this current study showed a strong relationship between self-reported stress and levels of loneliness with both variables showing 36% shared variance (Table 3.). This study was conducted to shed some light onto the impact Covid-19 has and will have on healthcare workers. The primary aim of this study was to gain a greater understanding on the role the two aspects hold on HCWs during a time of wreckage. In doing this the researcher used two questionnaires to obtain data for the study.

RQ1 - In support with research question 1 using the descriptive analysis the result can be seen that the Total UCLA mean was 47.26 (M=47.26). Previous research prior to covid shows an indication that the mean score is higher during Covid-19 which indicates that Covid-19 has had an impact on HCW's. According to (Russell D. W., 1996) in their study using the UCLA Version 3, they had a section of their sample which was Nurses (N = 305), their mean (M) score using the UCLA Loneliness scale was 40.14. from following what the score range indicates they were at medium levels of loneliness but still had a lower score than the current study (M= 47.26). Another study was conducted to examine the effect of 20 days in isolation for healthcare workers using the Revised UCLA (R-UCLA) and results showed a mean of 42.04 which again is a lower score to the current study (Bartoszek , Walkowiak, Bartoszek, & Kardas , 2020). This shows that the first study prior to Covid-19 had a mean of 40.14, then a couple of months into Covid-19 with a mean of 42.04 and now in this current study a mean of 47.26 after over two years working with Covid-19. However, between all three studies they have a different number of participants with the current study having the least amount (n = 90). In support of the first hypothesis – HCWs working during Covid-19 will score high on UCLA,

the current study in comparison with prior research is shown to indicate that the levels of loneliness have increased due to Covid-19.

RQ2 - In support of research question 2 this study examined the relationship between self-reported stress and levels of loneliness. The results from the current study explain a moderate positive association between both variables. As expected with the second hypothesis – there will be a relationship between stress and loneliness, this hypothesis is supported by the results as explained by the non-parametric spearman's correlation there was a large correlation of .6 which is acceptable and indicates a strong relationship. According to previous research which was conducted several years prior to Covid-19, they examined levels of stress, levels of loneliness and burnout levels. Results showed a positive relationship between all three variables however, while using the Perceived Stress Scale (PSS) questionnaire they received a mean of (M = 27.9) on a total of 141 participants. This is significantly lower to the results obtained in the current study (M = 74.11) with a stress mean over double the score (Stoliker & Lafreniere , 2015). Another study conducted during Covid-19 examined stress symptoms, anxiety, and depression on HCWs. Participant took part in the Depression Anxiety Stress Scale (DASS) to self- report how they felt due to Covid-19. Results for stress were examined from normal to extremely sever, the moral category had a mean of (M = 66.7) in frontline workers which contained 214 participants (Lenzo, Quattropani , Sardella , Martino , & Bonanno, Depression, anxiety, and stress among healthcare workers during the COVID-19 outbreak and relationships with expressive flexibility and context sensitivity, 2021). The current study explained for a mean of (74.11) which is higher than the previous study. So, from previous research the current study has a strong relationship between levels of loneliness and self-reported stress, while stress levels in this study are higher to previous research.

RQ3 - In support of research question 3 it can be concluded that employment is impacted the most by stress with employments beta value being the highest (.95) followed by

the Total UCLA (.63). In agreement with the third hypothesis this study explained that an increase in levels of stress was due to levels of loneliness. According to (Brown , Gallagher, & Creaven , 2018) while examining and comparing eleven studies the overall result reported a positive association between loneliness and acute stress. The evidence explained that greater levels of loneliness was associated with high levels of acute stress. The study showed the highest loneliness mean was (M = 47) using the UCLA Version 3 with a sample of 38 individuals. The mean in this sample is like the current study but the difference is the previous study was conducted in 2014 (Brown , Gallagher, & Creaven , 2018). Since Covid-19 began employers have had no choice but to encourage remote working meaning people are working from home daily. This has increased individuals' levels of loneliness due to social isolation from co-workers. A study explained the negative effect and perception loneliness and employment type has on an individual and how it increases an individual's stress levels. Their study showed how social isolation was significantly related to stress (Toscano & Zappala, 2020). In 2020 a study was conducted to investigate employment and stress levels in Chinese nurses who worked closely with Covid-19 in Wuhan where the virus originated. An online questionnaire was completed by 180 nurses with an age range between 21-48 years, results explained long working hours close to Covid-19 increased nurses stress levels (Mo, et al., 2020).

Findings from previous research does provide support to all three-research questions and hypotheses. Past and present research seem to indicate that healthcare workers who are on the frontline dealing with the virus closely are inclined to have an increase in their loneliness levels and stress levels. Important research demonstrates that when Covid-19 began HCWs had an increase in levels of loneliness and stress in comparison to studies prior to Covid-19 and now this current study which has 90 participants in which their levels of loneliness and stress has increased again when working with Covid-19 for two years. The extreme challenges of

distance from co-workers and family have begun to normalize social isolation, the stress for those HCWs who had children at home when schools closed but they were still expected to work in hospitals and healthcare providers (Abuhammad , 2020). As previously stated the current study is the first of its kind to examine both loneliness and stress in HCWs during Covid-19. The recent emerging literature research on both aspects supports the current research. In this current study there was only two aspects involved but recent research has evolved looking into what is to come from loneliness levels and stress levels. A study conducted during Covid-19 on 1,013 U.S adults explained that high scoring on the UCLA version 3 was strongly associated with greater depression and suicidal ideation (Killgore , Cloonan, Taylor , & Dailey , 2020). Awareness of both loneliness and stress needs to be understood with support to help HCWs who are in a vulnerable place. Both aspects examined in the current study are public health concerns now and prior to Covid-19.

As previously spoke about moral injury it has been present in recent research regarding stress, loneliness, and distress in HCWs. Moral injury which is considered a military term has become more popular as a diagnosis for psychological distress. This study conducted a longitudinal study between March and July 2020 with results explaining a stressful environment increases the likelihood of suffering moral injury and poor sleep. Obviously during Covid-19 where there was Covid-19 cases would be regarded as a stressful environment. HCWs potentially suffer from severe stress and loneliness due to outbreaks and isolation periods, the long-term effects of loneliness and stress related to Covid-19 are detrimental (Hines , Chin , Glick, & Wickwire , 2021).

Implications

This current study was conducted two years into a global pandemic (Covid-19) where HCWs have been experiencing both loneliness and stress for a long period of time and people have found a way to cope or carry on with these aspects. Hospitals and nursing homes are on

constant high alert with cases reoccurring and precautions to follow. An implication in this study was there was no prior to Covid-19 questions to be able to examine prior results with the same participants. Further research should include more participants and contain prior to Covid-19 questions to compare scores. It would be beneficial to consider in future studies if participants are suffering from loneliness and stress does it lead to depression, anxiety, or suicide ideation. Another implication in this current study was that all participants complete two self-report questionnaire and could have been embarrassed answering the questions so they could have not been totally honest as they might have felt in a vulnerable place.

A longitudinal study would have been more beneficial if participants answered questions over the course of a period. Then results would be clearer in seeing an increase or decrease in loneliness levels and stress levels. For future research it should be taking into consideration that the current study focused on the importance of loneliness and stress only and did not include mental, physical, or behavioural impacts in the two questionnaires.

Strengths and limitations

Although there are implications in this current study there are also several strengths, this study took into consideration each participants demographic information, so this study was able to examine the results in accordance with gender, age, employment type etc. The study was conducted using up to date modern questionnaires in which their validity is reliable (Russell D. W., 1996) (Russell, Peplau, & Cutrona, 1980). Strengths to consider from this study is that it was generalized due to being on social media platforms and cost- effective. It was conducted using a quantitative research method which can be easily replicated to examine if results are significant. This study attempted to broaden the view and understanding of what HCWs went through during Covid-19 and what the staff suffer from now. This study when comparing previous results for HCWs explained a significant increase in both aspects. The first

limitation of this study was that the researcher could not control a participant's environment when completing the questionnaire. The second limitation to consider is the insufficient sample size according to G-Power, the greater number of participants increases the statistical findings and worth of the research. As this study is the first to examine both aspects together there is a lack of precious research combining the two aspects.

Conclusion

In conclusion the results from this current study indicate that according to previous studies which examines self-reported stress and levels of loneliness explains that healthcare workers today have been impacted over Covid-19 with stress and loneliness levels increasing (Russell D. W., 1996). Findings from this study further support that Covid-19 has caused an increase significantly in levels of loneliness and self-reported stress in comparison to previous research prior to Covid-19 and during Covid-19. Therefore, the results from the current study have important details that can encourage or be a starting point for potential further research and add to psychological findings. The HCWs in the current study while caring for patients showed high levels in both aspects examined. For the duration of Covid-19 frontline staff were and still are exposed to the virus with the fear of being infected themselves. Now there is personal protective equipment (PPE) and precautions to be taking when dealing with a patient who has Covid-19 however, during the initial phase of the outbreak for several months' healthcare workers had no equipment to protect themselves and still worked with the basics. Covid-19 has and still does pose a challenge for those working close with it and this worldwide pandemic has shown that as a generation we need to be more prepared to protect our healthcare providers and staff but also have support ready for them (Park , 2020).

It is important to continuously keep up date with new findings and treatments that work for certain aspects. This would then led to a decrease in negative outcomes regarding the public

and HCWs health concerns weather it be physical, mentally, emotionally, or psychologically. The current study contributes to prior research by examining two major impacts HCWs suffered at the hands of Covid-19. Finding highlight the importance of both loneliness and stress as individual issues but also as a combined issue, as previously states they are both public health concerns and not to be taking lightly. In conclusion the research from this current study is supported by previous literature and expands on two major public health concerns in relation to healthcare workers.

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Appendix A

Information Sheet

(1) Title of the study

- The effects of loneliness and stress on healthcare workers due to Covid-19

(2) Why am I conducting this study? Do you have to take part in this study?

- My name is Amy Finnegan, and I am a final year student studying psychology in National College of Ireland. I am also a healthcare worker (HCW) and this is what peaked my interest in examining how covid-19 has affected our HCW's. This study is working towards my thesis with the aim of gathering data to see the impact of loneliness and stress on HCW's I want to examine why HCW's are suffering, understand the level they are suffering at while understanding the consequences covid-19 left in its wake.
- This study is 100% voluntary, nobody will be pressured or coerced into taking part. If this study interests, you and you are a HCW you can continue.

(3) Can I withdraw from this study?

- Participants have the right to withdraw at any point of this study without penalty. However, if a participant submits their data, it is impossible to retain and withdraw this data as it is unidentifiable. Participant can withdraw by pressing the "X" in the top right corner of their devise and close the tab.

(4) If I take part, what will I have to do? What will be done with my data?

- Participants will be sent a link via their email address; once they receive it, they can open the link in which it is a five-step process. (1) the information sheet (2) the consent form (3) the PSQ (4) the UCLA LS3 (5) debriefing form. Once completed the researcher will receive the data and that is your part done in the study.
- Your data will be collected and stored safely until it is transferred on SPSS software. This will transform the data into statistics, graph, and plots. The data will be kept safe for five years and then be disposed appropriately.

(5) Is your data public or private? What is the risk and benefit to this study?

- All participants data will be kept confidential for the duration and future of this study. Each participants dignity and respect will be upheld. The risks in this study are minimal however, a main risk for this study is emotional and social distress and both questionnaires are based around sensitive topics. The benefit will be taking part to provide data to the psychological findings for future generations to understand what it was like as a HCW during covid-19.

(6) If I have been affected by this study, what should I do?

- If a participant has been affected by this study a debriefing sheet will be provided at the end with my supervisor and my personal contact information if a participant has any further questions. Also, the debriefing sheet will contain websites and facilities participants can make use of if they need any further help.

Thank you for taking part in this study as part of my final year project!

Appendix B

Consent Form

By completing this form, you are consenting to taking part in this study.

- I _____ consent that I am taking part in this study voluntarily. I agree to participate in this study and understand I can withdraw at any time with no penalty.
- I _____ have been explained to that if I click submit with my data it can NOT be retained and withdrawn from the study as it is unidentifiable.
- I understand the aims, objectives and what will be done with the data collected.
- I understand that all my data will be kept confidential, and my respect an dignity will be upheld.
- I understand as a human participant I will not be manipulated, coerced or have information withheld from me.
- I _____ understand that in this research study I will be asked to take part in two questionnaires. Questionnaire 1 – the Perceived Stress Questionnaire this is used to understand the level of stress I am experiencing due to Covid-19. Questionnaire 2 – University City of Los Angeles version 3 is used to gather data to understand the level of loneliness I feel.
- I understand that by ticking the box below is indicating I am giving consent to partake in this study. I understand the duration of this study is one hour and will by completed by following this link.

Declaration – I _____ confirm that I have read and agreed with the above information. I confirm I understand the term and conditions for this study and agree to voluntarily take part.

By ticking this box, I agree to the information provided above and consent to take part ☐

Appendix C

Demographic Survey

(1) What is your age?

_____

(2) What is your gender?

A. Male
B. Female
C. Prefer not to say

(3) What is your ethnicity?

A. White/ Caucasian
B. Hispanic/ Latino
C. Black/ African American
D. Native American/ American Indian
E. Asian/ Pacific Islander
F. Other

(4) What is your highest degree or level of school you have completed?

A. Junior Certificate
B. Leaving Certificate
C. Post-Leaving Certificate
D. Bachelor's Degree
E. Master's Degree
F. Doctorate
G. Other

(5) What is your current employment?

A. Employed full time (40+)
B. Employed part-time (less than 40+)
C. Unemployed (looking for work)
D. Unemployed (not looking for work)
E. Student
F. Retired
G. Self employed

(6) What is your marital status?

A. Single
B. Married
C. In a domestic partnership
D. Divorced
E. Widowed

Appendix D

Perceived Stress Questionnaire (PSQ)

	Almost	Sometimes	Often	Usually
1. You feel rested	1	2	3	4
2. You feel that too many demands are being made on you	1	2	3	4
3. You are irritable or grouchy	1	2	3	4
4. You have too many things to do	1	2	3	4
5. You feel lonely or isolated	1	2	3	4
6. You find yourself in situations of conflict	1	2	3	4
7. You feel you're doing things you really like	1	2	3	4
8. You feel tired	1	2	3	4
9. You fear you may not manage to attain your goals	1	2	3	4
10. You feel calm	1	2	3	4
11. You have too many decisions to make	1	2	3	4
12. You feel frustrated	1	2	3	4
13. You are full of energy	1	2	3	4
14. You feel tense	1	2	3	4
15. Your problems seem to be piling up	1	2	3	4
16. You feel you're in a hurry	1	2	3	4
17. You feel safe and protected	1	2	3	4
18. You have many worries	1	2	3	4
19. You are under pressure from other people	1	2	3	4
20. You feel discouraged	1	2	3	4
21. You enjoy yourself	1	2	3	4
22. You are afraid for the future	1	2	3	4
23. You feel you're doing things because you have to not because you want to	1	2	3	4
24. You feel criticized or judged	1	2	3	4
25. You are lighthearted	1	2	3	4
26. You feel mentally exhausted	1	2	3	4
27. You have trouble relaxing	1	2	3	4
28. You feel loaded down with responsibility	1	2	3	4
29. You have enough time for yourself	1	2	3	4
30. You feel under pressure from deadlines	1	2	3	4

Appendix E

University City of Los Angeles version 3 (UCLA LS3)

TABLE 1
UCLA Loneliness Scale (Version 3)

Instructions: The following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way described by writing a number in the space provided. Here is an example:

How often do you feel happy?

If you never felt happy, you would respond "never"; if you always feel happy, you would respond "always."

NEVER	RARELY	SOMETIMES	ALWAYS
1	2	3	4

*1.	How often do you feel that you are "in tune" with the people around you?	_____
2.	How often do you feel that you lack companionship?	_____
3.	How often do you feel that there is no one you can turn to?	_____
4.	How often do you feel alone?	_____
*5.	How often do you feel part of a group of friends?	_____
*6.	How often do you feel that you have a lot in common with the people around you?	_____
7.	How often do you feel that you are no longer close to anyone?	_____
8.	How often do you feel that your interests and ideas are not shared by those around you?	_____
*9.	How often do you feel outgoing and friendly?	_____
*10.	How often do you feel close to people?	_____
11.	How often do you feel left out?	_____
12.	How often do you feel that your relationships with others are not meaningful?	_____
13.	How often do you feel that no one really knows you well?	_____
14.	How often do you feel isolated from others?	_____
*15.	How often do you feel you can find companionship when you want it?	_____
*16.	How often do you feel that there are people who really understand you?	_____
17.	How often do you feel shy?	_____
18.	How often do you feel that people are around you but not with you?	_____
*19.	How often do you feel that there are people you can talk to?	_____
*20.	How often do you feel that there are people you can turn to?	_____

Scoring:
Items that are asterisked should be reversed (i.e., 1 = 4, 2 = 3, 3 = 2, 4 = 1), and the scores for each item then summed together. Higher scores indicate greater degrees of loneliness.

Note.

Appendix F

Debriefing Form

Project – The effects of loneliness and stress on HCW's due to Covid-19

- I would like to thank all participants for taking part in my final year project to explore weather HCW's are suffering from loneliness and stress. If all participants could read this debriefing form carefully to help you understand about the study and obtain contact information if you have any questions about the study. All participants data that is collected throughout the study will be kept confidential. As the researcher I will uphold your rights to privacy and respect.
- In some cases, once a study is conducted and finished participants might not feel affected right in the moment so below, I will provide contact information if participants have any further questions or need help. There will also be websites and facilities provided if participants would like to reach out for help after conducting a study of two sensitive topics. By completing the PSQ and UCLA LS3 you are providing data to help understand covid-19 and contributing to psychological findings.
- Please use the help provided if participants feel any negative emotions making them feel uncomfortable after completing this study. Or contact the researcher via email – x19747839@student.ncirl.ie

1) Text "Hello" to 50808, to chat to someone about anything that is bothering you. It is a 24-hour line.
2) https://jigsaw.ie/ask-jigsaw-feeling-lonely-covid-19/ - providing group chats and 1-1 support.
3) https://au.reachout.com/forums - supportive and anonymous chat space to clear your thoughts.
4) "Day One" journaling app – write down and be able to think more clearly.
5) Better Help – online counselling for stress, depression, anxiety and more.
6) Dublin Counselling & Therapy Centre – 01-878-8236
7) The Therapy Centre – 01-962-9514
8) AD Counselling Services – 086-662-3774
9) The Counselling Centre – 083-350-9099
10) North-side Counselling Services – 01-848-4789

Appendix G

Written consent from employer

Shrewsbury House Nursing Home Ltd.

164 Clonliffe Road
Drumcondra
Dublin 3.

Tel: (01) 837 0680
Fax: (01) 837 0680
e-mail: info@dublinnursinghome.ie
Web: www.dublinnursinghome.ie

09/11/2021

To whom it may concern,

I understand Amy Finnegan is completing a study examining the effects of loneliness and stress on healthcare workers caused by the current pandemic. I give full permission for her to conduct a survey with health care staff in this organisation.

Yours sincerely,

Sinead Kiernan

Person in Charge

Appendix H

Evidence of SPSS file

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Age	Numeric	17	0	What is your a...	None	None	15	Right	Scale	Input
2	Gender	Numeric	17	0	What is your g...	{1, Male}...	None	17	Right	Nominal	Input
3	Ethnicity	Numeric	24	0	What is your et...	{1, White / ...	None	24	Right	Nominal	Input
4	School_Deg...	Numeric	36	0	What is your hi...	{1, Junior C...	None	36	Right	Nominal	Input
5	Employment	Numeric	34	0	What is your c...	{1, Employe...	None	34	Right	Scale	Input
6	Marital_Stat...	Numeric	25	0	What is your m...	{1, Single}...	None	25	Right	Scale	Input
7	Healthcare_...	Numeric	3	0	Are you a healt...	{1, Yes}...	None	17	Right	Nominal	Input
8	PSQ1	Numeric	9	0	You feel rested.	{1, Rarely}...	None	9	Right	Ordinal	Input
9	PSQ2	Numeric	9	0	You feel that to...	None	None	9	Right	Ordinal	Input
10	PSQ3	Numeric	9	0	You are irritable...	None	None	9	Right	Ordinal	Input
11	PSQ4	Numeric	9	0	You have too m...	None	None	9	Right	Ordinal	Input
12	PSQ5	Numeric	9	0	You feel lonely ...	None	None	9	Right	Ordinal	Input
13	PSQ6	Numeric	9	0	You find yourse...	None	None	9	Right	Ordinal	Input
14	PSQ7	Numeric	9	0	You feel you ar...	None	None	9	Right	Ordinal	Input
15	PSQ8	Numeric	9	0	You feel tired.	None	None	9	Right	Ordinal	Input
16	PSQ9	Numeric	9	0	You fear you m...	None	None	9	Right	Ordinal	Input
17	PSQ10	Numeric	9	0	You feel calm.	None	None	9	Right	Ordinal	Input
18	PSQ11	Numeric	9	0	You have too m...	None	None	9	Right	Ordinal	Input
19	PSQ12	Numeric	9	0	You feel frustrat...	None	None	9	Right	Ordinal	Input
20	PSQ13	Numeric	9	0	You are full of e...	None	None	9	Right	Ordinal	Input
21	PSQ14	Numeric	9	0	You feel tense.	None	None	9	Right	Ordinal	Input
22	PSQ15	Numeric	9	0	Your problems ...	None	None	9	Right	Ordinal	Input
23	PSQ16	Numeric	9	0	You feel you ar...	None	None	9	Right	Ordinal	Input
24	PSQ17	Numeric	9	0	You feel safe a...	None	None	9	Right	Ordinal	Input
25	PSQ18	Numeric	9	0	You have many...	None	None	9	Right	Ordinal	Input
26	PSQ19	Numeric	9	0	You are under ...	None	None	9	Right	Ordinal	Input
27	PSQ20	Numeric	9	0	You feel discou...	None	None	9	Right	Ordinal	Input
28	PSQ21	Numeric	9	0	You enjoy your...	None	None	9	Right	Ordinal	Input
29	PSQ22	Numeric	9	0	You are afraid f...	None	None	9	Right	Ordinal	Input