

What dreams reveal about people's emotional state due to the impacts of COVID-19

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Summary. The COVID-19 pandemic has caused major disruptions and changes in the lives of people all over the world, with a concerning number of people reporting a decline in mental health. Since the pandemic is such a recent event, there is very little research on COVID-19, let alone the impact it has had on people's dreams, however, the research that has just been published is incredibly insightful, and has revealed that consistent with the Continuity Hypothesis, the current pandemic has been reflected in many people's dreams. The purpose of this study was to expand previous research to determine whether people's mental health and general mood continue to be negatively impacted by the pandemic, as dreams typically reflect people's current mental/emotions, as per the Continuity Hypothesis. 109 participants aged 18 to 63 and currently residing in Canada were recruited and completed a survey measuring fears of contracting illnesses using the Illness Attitude Scales (IAS), levels of depression, anxiety, and stress using the Depression Anxiety and Stress Scale-21 (DASS-21), dream imagery, and general demographics questions including anxiety about the pandemic. Results indicated that overall, negative dream imagery including anxiety, stress, and depression-related imagery was related to anxiety about the pandemic and scores of depression, anxiety, and stress on the DASS-21 and fears of contracting illnesses. This study supports the Continuity Hypothesis which suggests dreams are reflective of waking-day experiences, emotions, desires, and activities.

Keywords: Dreams, Covid-19, anxiety, stress, depression, illness fears, Continuity hypothesis

1. Introduction

The coronavirus disease, causing the COVID-19 pandemic, originated in China but has made its way globally and has had a major impact on the physical and mental health of many individuals (Borges do Nascimento et al., 2020). The virus was first discovered after multiple reports of people being infected by a new disease after visiting a seafood/animal market in Wuhan, China in December 2019 and is called severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2 (Borges do Nascimento et al., 2020; Xu et al., 2020). It spreads from person to person through close contact, and is thought to be transmitted specifically through respiratory droplets, although studies have shown mixed results (Mehra et al., 2020; Chu et al., 2020). As of June 2021, across the world there have been 173.5 million cases and 3.7 million deaths reported as a result of the virus (Worldometer, n.d.).

Dreaming is now commonly thought by researchers to be reflective of people's preoccupations and concerns of individuals in their waking day, a theory known as the Continuity Hypothesis, originally suggested by Bell and Hall (1971) (Erdelyi, 2017). The Continuity Hypothesis suggests that an individual's waking thoughts, emotions, behaviours, and fantasies are reflected during sleep via dreams (Scarpelli et al., 2019; DeCicco, 2007). Both positive and nega-

tive emotional experiences can be reflected in dream experiences, so long as the emotional experience is intense enough, and highly stressful/traumatic experiences in waking life can also be incorporated in dreams (Dale & DeCicco, 2011; Schredl, 2006; Malinowski & Horton, 2014; Dale et al., 2015; Punamäki, 2007). King and DeCicco (2007) discovered that mental health can be reflected in dream content, as those lower in emotional well-being and having higher levels of depression displayed more negative emotions in their dreams such as sadness and anger.

Since the pandemic is such a recent event, there is very little research on COVID-19, let alone the impact it has had on people's dreams, however, the research that has just been published is incredibly insightful. Schredl and Bulkeley (2020) found a significant number of participants reported that they felt as though the pandemic has impacted their daily life and their subjective well-being. This was reflected in their dream content as the more affected individuals were by the pandemic, mental health in particular, the more individuals reported a higher rate of dream recall, more COVID-19 related dreams, and more negative dream emotions (Schredl & Bulkeley, 2020). Another study related to the pandemic and dreams in terms of the Continuity Hypothesis focused on emotions and body concerns (Barrett, 2020). Barrett (2020) found that in comparison to the dreams of a group of individuals before the pandemic occurred, people's dreams during the pandemic contained significantly more negative emotions, anger, and sadness, and more dreams of biological processes, body, health, and death. Additionally, MacKay and DeCicco (2020) found more animal imagery and more changes in location for the dream content (increased animal dream imagery and more location changes are often related to higher waking-day anxiety) of a pandemic group of dreamers versus the dreams of a pre-pandemic control group, as well as a higher presence of virus-related imagery in dreams (MacKay & DeCicco, 2020).

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During stressful times or catastrophic events, people's mental health and general mood can be greatly negatively impacted, and the pandemic is no exception; people have been increasingly reporting that their mental health is taking a toll in these uncertain and anxiety-riddled times, and that their mood in general has been overall more negative since the start of the pandemic (López-Carral et al., 2020). The global pandemic has been an incredibly stressful situation for most people, as it has been such an unpredictable situation, and the uncertainty of the seriousness of the risk of the virus and misinformation about the pandemic have heightened the experience of stress (Zandifar & Badrfam, 2020). Recent studies have indicated that those forced into isolation/quarantine have been particularly affected by the pandemic in terms of their mental health, as there has been a significant increase in reports of psychological distress, as well as a general spread of anxiety and depression all over the world (lorio et al., 2020). Such an intense form of isolation has historically never been experienced and has been so traumatic for some people that they are even experiencing symptoms of posttraumatic stress disorder, and researchers fear that these negative effects will be long-lasting (Brooks et al., 2020).

It is important to note that not everyone may have the same worries or attitude towards the pandemic, so the pandemic may not be reflected in all people's dreams; possibly only those that are experiencing anxiety or have been personally impacted by it. It may depend on people's attitude towards illness in general and specifically related to SARS-CoV-2, because not everyone feels the same or attributes so much importance to illnesses in their personal life (Asmundson & Taylor, 2005). People have indeed been found to have very drastically different attitudes about the risk of the COVID-19 pandemic, as some people have been listening to all guidelines about wearing masks, washing hands, social distancing, etc., while others have been ignoring all precautions; they seemingly think they are invincible, and have been found to be gathering in large crowds with no masks or social distancing (Cori et al., 2020).

The Current Study

This study was an extension of the study conducted by MacKay and DeCicco (2020) on whether the major changes in people's lives caused by the pandemic are also reflected in people's dreams. Furthermore, this study examined if dreams predict factors relating to the virus in waking day life, such as mood or attitude about illness. The first study was conducted in-lab at very early stages of the pandemic, yielding important findings about the impact of COVID-19 on people's state of mental health. This study was conducted during the later stages of the pandemic, to examine how people's dreams and mental state have changed since the beginning of the pandemic, as demonstrated by MacKay and DeCicco (2020).

2. Hypotheses

2.1. Hypothesis 1

External events and experiences play a role in individual's mood, stressful life events and catastrophic events can cause people's moods to turn negative, with depression and anxiety typically a common occurrence (Watson, 2000). These findings ring true for the pandemic's impact on peo-

ple's mood, as many people have reported a degradation in their general mood and overall mental health since the beginning of the pandemic, especially in terms of anxiety and depression (lorio et al., 2020). However, the psychological impacts are higher for those that have a personal tie to the pandemic: those that know someone who has had SARS-CoV-2 or they themselves have had it tend to be more at risk for developing mental illnesses than those that have not (Boyraz & Legros, 2020). The results of the study by lorio et al. (2020) indicated that the dreams of participants that had known someone who had died from COVID-19 or was impacted by the pandemic were more emotionally intense and had more sensory impressions. Given this research, therefore, Hypothesis 1 states that people who report knowing someone with the novel SARS-CoV-2 and/or who has died from it, or they themselves have had it, would report significantly higher levels of stress, anxiety, and depression (as measured on the Depression Anxiety and Stress Scale-21 (DASS-21)) and significantly higher scores of anxiety on the Illness Attitude Scales (IAS), as well as more COVID-19 imagery, anxiety imagery, and depression imagery in their dreams.

2.2. Hypothesis 2

Since this study was an expansion of the study by MacKay and DeCicco (2020), Hypotheses 2 and 3 of the study are largely based on their findings that compared to the dreams of a pre-pandemic control group, the dreams of those that were experiencing the beginning of the COVID-19 pandemic displayed significantly more COVID-related content that reflects waking-day anxiety. There were more frequent changes in location and more animal imagery in those that were experiencing COVID-19, which are all indicative of waking-day anxiety (MacKay & DeCicco, 2020). There was also more head imagery which is indicative of pandemic-related content, as head or facial imagery can be representative of common symptoms of the virus such as coughing and sore throats (MacKay & DeCicco, 2020).

As per the Continuity Hypothesis, the preoccupations, waking day experiences, emotions and concerns are reflected in dream content, and based on research that catastrophic events can have a huge impact on people's waking day mood, the pandemic will likely have a negative impact on people's mood and mental health, therefore being reflected in their dreams (Erdely, 2017; Watson, 2000; Scarpelli et al., 2019). Additionally, depression in dreams typically consists of imagery with more sadness, anger, and aggression, where the dreamer is the victim, and depressed individual's dreams are generally more negatively toned with more themes of death than those that are not depressed (King & DeCicco, 2007). Therefore Hypothesis 2 states that there would be a significant and positive relationship between anxiety-related dream imagery, depression imagery, and COVID imagery and scores for stress, depression, and anxiety for the DASS-21. The more stressed an individual is about the pandemic, the more this stress would be reflected in their dreams.

2.3. Hypothesis 3

Based on the findings of the study of the impacts of COVID-19 on dreams by Schredl and Bulkeley (2020) that health-related dreams were reported more by those that were worried about their health and contracting the virus, therefore,

Hypothesis 3 states COVID-19 related dream imagery and anxiety-related dream imagery would be significantly positively associated with high scores on the IAS that indicate significant stress levels and high levels of fear about contracting illnesses.

2.4. Hypothesis 4

Since the anxiety experienced by individuals towards contracting the virus is on a continuum, with the extremely anxious individuals having a false sense of urgency and the individuals having little to no anxiety about the virus that act as if the pandemic is not happening, depending on people's fear of contracting illnesses in general and specifically related to SARS-CoV-2, there will be varying levels of anxiety among the population because not everyone feels the same or attributes so much importance to illnesses in their personal life (Asmundson & Taylor, 2020; Cori et al., 2020). Therefore, Hypothesis 4 states that there will be a significant and positive relationship between questions 12 to 14 of the Demographics Scale ("How did you feel when you first heard about COVID-19?", "How did you feel when the first wave hit your country?", and "How do you feel about a second wave hitting your country?") regarding those reporting feeling more worried about the pandemic hitting and each wave, and moderate to severe scores of stress, anxiety, and depression on the DASS-21, scores of anxiety about catching illnesses on the IAS, and COVID-related dream imagery and anxiety and depression imagery (as per the Continuity Hypothesis (Schredl, 2006; Dale & DeCicco, 2011; King & DeCicco, 2007; Erdely, 2017).

3. Method

3.1. Measures

3.1.1 Demographics

Demographics was measured using an online questionnaire with general questions regarding people's age and gender, as well as the country people were born in and have resided in for most of their life. Participants were also asked which country they were currently in while completing the questionnaire, their occupation, and their highest level of education. Participants were asked about their social media and news habits, specifically which platforms they use to obtain their news from and which types of social media platforms they use on a regular basis.

Finally, participants were asked COVID-related questions, such as which types of social media platforms/Internet sites they use to obtain information about COVID-19. Participants were also asked about their general thoughts and feelings about the pandemic (specifically how they felt when they first heard about COVID-19, when the first wave hit their country, and how they felt about the second wave hitting their country (this study took place when the second wave was first starting to become present in Canada). These questions were administered using a Likert scale for statements related to each wave of the pandemic. Specifically, the statements pertaining to each question were, "I think the pandemic is a joke/hoax", "I was nervous", "I followed all of my region's rules and guidelines", "I stopped going out", and "I stocked up on supplies". For each statement, participants could choose their answer on a scale ranging from "Strongly Disagree" to "Strongly Agree. Participants were

also asked whether they personally knew someone who has fallen ill with COVID-19, and whether they personally knew someone who has died of COVID-19.

3.1.2 General Mood

General mood was measured using the Depression Anxiety Stress Scale-21 (DASS-21). The DASS-21 was created by Lovibond and Lovibond (1995) and is a well-validated and constructed 21-item survey that measures negative affect and emotional distress, specifically the severity and range of symptoms of stress, depression and anxiety (Zanon et al., 2020; Szabó, 2010). The DASS-21 measures both mental and physiological symptoms of stress, anxiety, and depression (Samani & Joukar, 2007). It is important to note that while the DASS-21 can contribute to the diagnosis of Anxiety or Depression, it is not meant to be used as a diagnostic tool for these disorders, as further symptoms of Depression and Anxiety that are not covered by the DASS-21 must be assessed independently (Osman et al., 2012). Not only has this scale been tested and validated cross-culturally, but it has also been tested, and validated, among several age groups, including the young and elderly, which is important to note as this study targeted a wide range of ages (Oei et al., 2013; Szabó, 2010; Gloster et al., 2008). The DASS-21 has also been validated for both clinical and non-clinical samples (Zanon et al., 2020).

3.1.3 Attitude Towards Illness

Attitude towards illness was measured using the Illness Attitude Scales (IAS). Developed by Robert Kellner, these scales specifically measure the degree of Hypochondriasis an individual has, which is fears of an individual having or the idea of having an illness/ serious disease because of misinterpreted symptoms of the body (Sirri et al., 2008). There are 29 items in the scales designed to measure hypochondriacal attitudes, beliefs, fears, and abnormal illness behaviours, and each item is rated on a scale from 0 to 4 (specifically rarely, sometimes, often, and most of the time) (Weck et al., 2009). These scales are one of the most used scales for measuring fears about developing illnesses and have been found to have extremely high content validity in comparison with other attitude towards illness scales which is why these scales were chosen for this study (Weck et al., 2009; Sirri et al., 2008). The Illness Attitude Scales have also been tested for being effective and valid when administered through the internet and have been found to still perform equally well (Hedman et al., 2015). This is important for the current study because this study was conducted via the Internet. However, since these scales only measure attitude towards general illnesses, this study also included questions pertaining specifically to people's attitude towards SARS-CoV-2 in the demographics questionnaire.

3.1.4 Dream Content

Dream content was analyzed using the Hall and Van De Castle coding system (Hall & Van de Castle, 1966). This method allows for researchers to avoid any bias by requiring specific inclusion criteria for the scoring of dreams (Domhoff, 2001). This ensures the researcher remains objective when analyzing participant's dreams, so as not to include any of the researcher's own assumptions (Domhoff, 2001). The Hall and Van De Castle coding system does this by allowing the in-

dividual analyzing the dream to identify ten main categories (which often have two or more subcategories) appearing in participants' reported dreams, including characters (including the subcategories animals and mythical creatures), settings, objects, emotions, misfortunes and fortunes, interactions (such as with other characters or the dreamer's environment), the presence of food and eating, elements from the past, and descriptive elements (Elce et al., 2021). However, any items within a dream must be clearly stated by the dreamer in their report in order to be included in the dream category score for how frequently each item occurs in dreams, thus eliminating any subjectivity that may come from the researcher (MacKay & DeCicco, 2020).

The dream categories in the current analyses included all ten of the main categories included in the Hall and Van De Castle coding system, as well as COVID-related categories. The total amount of COVID-related imagery was scored based on whether any of these categories were relevant to the pandemic, such as being in a grocery store with bare shelves or the dreamer being aware that the dream was taking place during the pandemic versus another time in history/ their life), and the mention of Personal Protective Equipment (PPE). Dream content was collected via question 18 of the Demographics scale which asks, "Please describe in detail, and as much as you remember, about the most recent dream you have had in the past two weeks".

3.2. Procedure and Participants

The study was administered via an online survey using a survey platform called SurveyMonkey. Participants were recruited via Facebook and Instagram by the researchers through the use of a Hyperlink that would take participants directly to the survey. There were 196 participants total to start, but 87 participants were excluded from the study due to incomplete responses and/or not reporting having a dream within the past two weeks. Of the remaining 109 participants, 24 were males, 83 were females, and 2 were gender variant/non-conforming, aged 18 to 63 years ($M = 26.3$). Most participants were living in Canada at the time of completing this survey ($N = 103$).

This study was approved by the Trent University Research Ethics Board. The inclusion criteria required participants to be 18 years of age or older. Participants explicitly agreed to participate the survey and only had access to the survey once they gave their written, informed consent electronically. Participants were first presented with a demographics scale, then the DASS-21 to measure stress and symptoms of depression and anxiety, followed by the Illness Attitude Scales, to measure fears of each participant having or the idea of having an illness/serious disease. The study was administered to English speaking adults only, to avoid any issues of language barriers.

3.3. Statistical Analyses

SPSS was used for all statistical analyses, including demographics, COVID-19 related, dream related, stress, anxiety, and depression related, and illness attitude related characteristics of the sample. To test all four Hypotheses, a correlation table was conducted.

4. Results

4.1. Hypothesis 1

Hypothesis 1 was partially supported, as some hypothesized relationships were non-significant or opposite to expected (Table 1). There was no significant relationship between people who report knowing someone with the novel SARS-CoV-2 and/or who has died from it and scores of stress, and anxiety, and depression on the DASS-21, nor scores on the IAS. There was no significant relationship between knowing someone with SARS-CoV-2 and anxiety and depression imagery. There was, however, a significant, positive relationship between knowing someone with SARS-CoV-2 and COVID-19 imagery, particularly frequent dreaming of being indoors ($r = .246, p < .05$). There was also a significant, negative relationship between knowing someone with SARS-CoV-2 and dreaming of food ($r = -.190, p < .05$) and travel ($r = -.197, p < .05$). The more a person tends to know someone with SARS-CoV-2, the more they tend to dream of being indoors and the less they tend to dream of food and travelling. In terms of knowing someone who has died from the virus, there was a significant, positive relationship between knowing someone who has died from SARS-CoV-2 and a general positive dream tone ($r = .196, p < .05$). There was a significant, negative relationship between knowing someone who has died from SARS-CoV-2 and feeling anxious while dreaming ($r = -.276, p < .01$) as well as themes of being in a grocery store ($r = -.193, p < .05$) and bedroom ($r = -.294, p < .01$). The more someone tends to know someone who has died from SARS-CoV-2, the more positive their dreams tend to be and the less anxious they tend to feel while dreaming, and the less they tend to dream of being in a grocery store or bedroom.

4.2. Hypothesis 2

Hypothesis 2 was supported, as there was a significant and positive relationship between anxiety-related dream imagery, depression imagery, and COVID imagery and scores for stress, depression, and anxiety for the DASS-21 (Table 1). Specifically, in terms of depression and COVID-19 imagery, there was a significant, positive relationship for scores of depression on the DASS-21 and PPE dream imagery ($r = .217, p < .05$). In terms of depression and depression-related imagery, there was a significant, positive relationship for scores of depression on the DASS-21 and darkness in dreams ($r = .201, p < .05$) and issues with the dreamer's significant other in dreams ($r = .293, p < .01$). There was also a significant, negative relationship between scores of depression on the DASS-21 and a general positive dream tone ($r = -.280, p < .05$) and being outdoors in a dream ($r = -.217, p < .05$). The more depressed a person is, the more they tend to have unpleasant dreams relating to the pandemic and issues surrounding their significant other or their teeth falling out, as well as dreaming of darkness. Additionally, the less depressed a person is, the more they tend to be outside in their dreams.

In terms of anxiety imagery and depression scores, there was a significant, positive relationship between scores of depression on the DASS-21 and dreaming of one's teeth falling out ($r = .204, p < .05$). In terms of scores of anxiety and dream imagery, there was a significant, positive relationship between scores of anxiety on the DASS-21 and dreaming of failing school ($r = .212, p < .05$). The more anxious a person is,

Table 1. Inter-correlations of Depression (DEP), Anxiety (ANX), Stress (STR), Illness Attitude Scores (IAS), and Dream Categories.

	DEP	ANX	STR	IAS	Q17	Q18	DANX	TON	PROB	PPE	BED	DARK	OUT	IN	TRAV	LIFE	GROC	TEETH	ASS	FOOD	FAIL	
DEP		.644**	.718**	.454**	.109	.014	.180	-.280**	.293*	.217*	-.015	.201*	-.217*	-.014	-.067	.052	-.040	.204*	.018	.041	.187	
ANX			.702**	.392**	.153	.037	.177	-.159	.085	.131	-.033	.165	-.06	-.073	.018	.112	.083	.183	.100	.077	.212*	
STR				.399**	.075	.057	.093	-.240**	.275*	.167	-.149	.163	-.185	-.018	-.071	.127	-.004	.182	.035	-.018	.207*	
IAS					.037	.016	.151	-.132	.003	.009	-.025	.197*	-.117	-.088	.029	.202*	.047	.049	.195*	.083	.098	
Q17							-.084	-.016	-.047	.105	-.076	.152	-.095	.246*	-.197*	.121	-.140	.089	.089	-.190*	-.006	
Q18								.497**	-.078	.043	-.294**	.092	.029	.123	-.107	.090	-.193	.031	.031	-.177	.043	
DANX								-.249**	-.105	.243*	.012	.249**	.094	.101	-.055	-.080	.223*	-.027	-.027	.117	-.039	
TON									-.326**	.007	-.122	-.069	.242**	.121	.144	-.204**	-.249**	-.084	-.084	.148	-.119	
PROB										-.091	-.040	-.009	-.267**	-.058	-.073	.004	-.051	-.036	-.036	-.105	-.051	
PPE											-.087	-.071	.017	.301**	.006	-.069	.042	-.024	-.024	.073	-.034	
BED												-.102	-.193*	-.136	-.069	.012	-.049	-.034	-.100	.512**	-.049	
DARK													.035	.061	-.057	.029	-.040	-.028	-.035	-.001	-.040	
OUT														-.221*	.272**	.019	-.099	-.060	-.046	.176	-.099	
IN															-.076	-.109	-.053	-.037	-.053	.536	-.053	
TRAV																-.055	-.027	-.019	-.027	.355**	.704**	
LIFE																	-.039	-.027	-.027	-.080	-.039	
GROC																		-.013	-.013	.536	-.019	
TEETH																			-.009	-.027	.704**	
ASS																				-.027	-.013	
FOOD																						-.039
FAIL																						

Note. DEP= depression, ANX= anxiety, STR= stress, IAS= illness attitude scores, Q17= knowing someone that has fallen ill with the virus, Q18= knowing someone that has died from the virus, DANX= dreamer feels anxiety during dream, TONE= positive dream tone, PROB= issues with significant other, PPE= COVID-related dream imagery (such as masks and social distancing), BED= bedroom scene in dream, DARK= darkness in dream, OUT= outdoor scene in dream, IN= other indoor scenes in dream, TRAV= travelling dream theme, LIFE= life or death situation in dreams, GROC= grocery store scene in dream, TEETH= teeth falling out in dream, ASS= dreamer being sexually assaulted in dream, FOOD= food imagery in dream, FAIL= dreamer is failing school.

* $p < .05$, ** $p < .01$ N= 10

the more they tend to dream about failing school. For stress scores and dream imagery, there was a significant, positive relationship between scores of stress on the DASS-21 and dreaming of issues with one's significant other ($r = .275$, $p < .05$) and dreaming of failing school ($r = .207$, $p < .05$). There was also a significant, negative relationship between scores of stress on the DASS-21 and a general positive dream tone ($r = -.240$, $p < .01$). The more stressed an individual is, the more they tend to dream about failing school or having issues with their significant other.

4.3. Hypothesis 3

Hypothesis 3 was partially supported, as there was a significant, positive relationship between high scores on the IAS and anxiety-related dream imagery but not with COVID-19 related imagery (Table 1). Specifically, high scores of the IAS were significantly positively related to dreaming of being in a life-or-death situation ($r = .202$, $p < .05$), dreaming of darkness ($r = .197$, $p < .05$), and dreaming of being sexually assaulted ($r = .195$, $p < .05$). The more an individual fears contracting illnesses, the more they tend to dream about being sexually assaulted and/or being in life-or-death situations and/or darkness.

4.4. Hypothesis 4

Hypothesis 4 was partially supported, as there was no relationship between questions 12 to 14 of the Demographics Scale and scores of depression, stress, and anxiety on the DASS-21, nor scores of anxiety about catching illnesses on the IAS, but there were significant relationships between questions 12 to 14 of the Demographics Scale and COVID-19, anxiety, and depression imagery (Table 2). Specifically, question 12 of the demographics scale was significantly positively associated with kitchen scenes ($r = .254$, $p < .05$)

and dreams where the dreamer was facing a life-or-death situation ($r = .226$, $p < .05$). The more fearful of the pandemic an individual was when they first learned of it, the more they tended to dream about being in their kitchen and being in a situation where they could die. Question 13 of the Demographics Scale was significantly positively associated with the number of animal characters in a dream ($r = .201$, $p < .05$). The more fearful of the pandemic an individual was when the first wave hit their country, the more they tended to have animals as characters in their dreams.

Finally, question 14 of the Demographics Scale was significantly positively associated with the dreamer feeling sad ($r = .190$, $p < .05$) and with dreaming and being in a situation where they could die ($r = .265$, $p < .01$). There was also a significant negative relationship between question 14 of the Demographics Scale and the dreamer being sexually assaulted ($r = -.236$, $p < .05$), experiencing some type of aggression or violence in their dream ($r = -.224$, $p < .05$), and being at work in their dream ($r = -.192$, $p < .05$). The more fearful about the pandemic an individual is, the more they tend to dream about being in a life-or-death situation and/or being sad, but the less they tend to dream about experiencing some type of aggression or violence and/or being assaulted, and the less they tend to dream about being at work.

5. Discussion

In partial support of Hypothesis 1, results did not indicate a relationship between people who report knowing someone with the virus and/or who has died from it and scores of stress, and anxiety, and depression on the DASS-21, nor scores on the IAS. This contrasts with previous research that has found that the unexpected/sudden death of a loved one is a risk factor for several mental illnesses, including

Table 2. Inter-Correlations of DASS-21 Depression, Anxiety, and Stress, COVID-related fears, and dream imagery

	DEP	ANX	STR	Q12	Q13	Q14	SAD	VIO	ASS	LIFE	ANIM	WRK	KITC
DEP		.644**	.718**	.014	.055	.082	.116	.040	.018	.052	-.095	-.072	-.007
ANX			.707**	.003	.053	.004	.167	.100	.100	.047	-.041	-.137	.036
STR				-.030	-.052	-.005	.107	.145	.035	.127	-.010	.040	.094
Q12					.508**	.367**	.173	.009	.123	.226*	-.028	-.108	.254*
Q13						.497**	.106	-.087	-.056	.174	.201*	-.176	.149
Q14							.190*	-.224*	-.236*	.265**	.129	-.192*	.061
SAD								.057	-.021	-.062	.032	-.075	-.053
VIO									.251**	.011	.150	.124	.039
ASS										-.027	-.032	-.033	-.023
LIFE											.075	.204*	.240*
ANIM												-.113	.113
WRK													-.083
KIT													

Note. DEP= depression, ANX= anxiety, STR= stress, Q12= fear and anxiety towards first hearing about the pandemic, Q13= fear and anxiety towards the first wave hitting, Q14= fear and anxiety towards the second wave hitting, SAD= dreamer feels sad during dream, VIO= violence or aggression in dream, ASS= dreamer being sexually assaulted in dream, LIFE= life or death situation in dream, ANIM= #of animals in dream, WRK= dreamer is at work, and KITC= kitchen scene in dream.

*p<.05. **p<.01 N= 109

symptoms of PTSD, major depressive disorder, and panic disorder (Boyratz & Legros, 2020). Additionally, individuals that knew someone who has died from the virus tended to have a more positive overall dream tone and they tended to feel less anxious while dreaming. They also tended to dream less of being in a grocery store and being in a bedroom. These results differ from the results of previous studies that have found the dreams of participants that had known someone who had died from COVID-19 or was impacted by the pandemic were more emotionally intense and had more sensory impressions (Iorio et al., 2020). This discrepancy and lack of findings may be partially related to this study having too few participants that have known someone who has died from the virus to properly test this correlation. Only 10 participants reported knowing someone that had died from the virus. Not everyone who has lost a loved one due to sudden death is at risk for these disorders, so this study's sample size may be too small to be representative of at-risk individuals who may indicate more depression, stress, and anxiety levels than normal when grieving for a loved one (Boyratz & Legros, 2020).

There was no significant relationship between knowing someone with the virus and anxiety and depression imagery. There was, however, the finding that individuals that knew someone with the virus tended to dream of more COVID-19 imagery, particularly frequent dreaming of being indoors, and these individuals tended to dream less of food and travel. These findings suggest that those that know someone with the virus may be more cautious than those

that do not. This could be partially related to a positive illusion (defined as an individual thinking they are more likely to experience a greater number of good events than others, and a lesser number of bad events than other people) where people think the virus will not infect them, thinking "it will not happen to me" which becomes more real when people know someone personally with the virus (Boucher, 2010). This is consistent with previous research that has found that the psychological impacts are higher for those that have a personal tie to the pandemic: those that know someone who has had the virus or they themselves have had it tend to be more at risk for developing mental illnesses than those that have not (Boyratz & Legros, 2020).

In support of Hypothesis 2, Results indicated anxiety-related dream imagery, depression imagery, and COVID imagery were significantly and positively associated with stress, depression, and anxiety scores for the DASS-21. The more depressed a person is, the more they tend to have unpleasant dreams relating to the pandemic (such as being indoors and realizing they have walked in without a mask on) and issues surrounding their significant other or their teeth falling out, as well as dreaming of darkness. Additionally, the less depressed a person is, the more they tend to be outside in their dreams. The more anxious a person is, the more they tend to dream about failing school. The more stressed an individual is, the more they tend to dream about failing school or having issues with their significant other. This finding is consistent with previous research that has found the dreams of more depressed individuals are generally more

negatively toned than those that are not depressed (King & DeCicco, 2007). These findings are also very reflective of the Continuity Hypothesis, which suggests that preoccupations, waking day experiences, emotions and concerns are reflected in dream content (Scarpelli et al., 2019). Firstly, the findings that PPE was common imagery in the dreams of more depressed individuals is reflective of research that has found catastrophic events can have a huge impact on people's waking day mood, so it is likely that those that are more distressed by the pandemic in terms of their general mood tend to dream more about the pandemic (Carmassi et al., 2014). Next, the finding that higher scores of stress and depression were associated with issues with the dreamer's significant other could be reflective of the fact that many people are living with their significant other during the pandemic, so this is likely a major source of stress for them simply because they have been forced to remain in a small space with each other for so long. Finally, many of the participants in this sample were students, (N= 59) and it is well known that college and university tend to be one of the main sources of stress and anxiety for individuals in post-secondary education. Students that are stressing about their grades on assignments and exams in their waking lives will likely dream about these stresses in their dreams, as the Continuity Hypothesis suggests (Scarpelli et al., 2019). This study is also the first study known to the researchers to identify a relationship between lower levels of depression and being outside more. This is consistent with research that suggests that being outside is beneficial for one's mental well-being, as research has found that the more time spent outdoors, the better individual's well-being tends to be (Kruize et al., 2020). This further supports the idea of the Continuity Hypothesis, as those that spend more time outside may tend to be happier, and they may dream of being outside more since they are outside more in waking-day life.

In partial support of Hypothesis 3, findings indicated that the more an individual fears contracting illnesses, the more they tend to dream about anxiety-related and other distressing imagery, specifically being sexually assaulted and/or being in life-or-death situations and/or darkness. However, there was no association with fear of contracting illnesses and COVID-19 imagery. These results are consistent with the findings that waking-day experiences are indeed found to be reflected in dreams, so if an individual does not feel anxious or worried about contracting an illness such as the virus, their dreams may not necessarily be upsetting or negative (Schredl, 2006; Malinowski & Horton, 2014; Punamäki, 2007). Individuals that are afraid of contracting illnesses that could kill them likely have a greater tendency to dream about situations in which they are at risk of dying or other similar distressing situations. The lack of relationship between illness attitude fears and COVID-imagery may suggest that COVID-19 imagery itself is not necessarily representative of contracting the virus, it may be more representative of life in general right now, as the norm in Canada has become wearing a mask, sanitizing hands constantly, and social distancing.

In partial support of hypothesis 4, there was no relationship between being anxious about first hearing of COVID-19 and anxiety about each wave and IAS or DASS-21 scores. However, anxiety about first hearing about the pandemic was significantly positively associated with kitchen scenes and dreams where the dreamer was facing a life-or-death situation. Anxiety about when the first wave hit was signifi-

cantly positively associated with the number of animal characters in a dream, which is a symbol of anxiety (MacKay & DeCicco (2020). Finally, anxiety about the second wave hitting was significantly positively associated with the dreamer feeling sad while dreaming and being in a situation where they could die, and negatively associated with dreaming about being sexually assaulted, experiencing some type of aggression or violence in a dream, and being at work in a dream. These results are both consistent with previous research and also present new findings. First, previous studies have found that in comparison to the average dreams that individuals have had at an earlier time, before the pandemic, there are significantly more negative emotions, more anger, sadness, biological processes, body, health, and death imagery in the average dream since the beginning of the pandemic (Barrett, 2020). However, this study builds on these findings and provides new insights into the pandemic because no current study known to the researchers has yet studied the impacts of each wave of the pandemic on individual's dreams. This study demonstrates that fears of the pandemic hitting one's own country are related to an increase in distress in dreams, and these fears seem to escalate as dreams seem to become more negatively intense as the pandemic continues, which suggests that individuals have become increasingly stressed about the pandemic, as per the Continuity Hypothesis (Scarpelli et al., 2019).

The lack of findings of IAS and DASS-21 scores in terms of being anxious about the pandemic may partially be a result of the pandemic being more of a long-term detriment to people's mental well-being, so although they are somewhat distressed with each phase of the pandemic, the effects of the pandemic have taken longer to affect people's mental state. In other words, people are distressed at a subconscious level and this distress is presented in individual's dreams, but as the pandemic continues people may feel more significant levels of anxiety, stress, and depression. Additionally, although people anxious of the pandemic tend to dream more about life-or-death situations but less about being sexually assaulted and other types of violence suggest that these individuals may be more pre-occupied with the dangers the pandemic entails that this is at the forefront of their minds, so this is displayed in their dreams. They may have other, non-violent types of life-or-death dreams since the pandemic is a non-violent form of distress.

6. Conclusion

Overall, people do appear to be distressed over the pandemic, and this distress is reflected in their dreams, with those personally knowing someone who has had the virus having more negative and upsetting dreams than those that do not personally know someone who has had the virus. However, this study is not without its limitations and these limitations suggest directions for future research. Firstly, this was a correlational study, so causal conclusions cannot be made. It is impossible to say whether the impacts of the pandemic cause individuals to dream more negative, anxiety, depression, and stress-related imagery, it is only known that there is an association between these variables. Secondly, although this sample did have a decent number of participants that were not students, this study did also have many participants that are students (N= 59). Students tend to have higher levels of stress and anxiety than the general population because not only are they experiencing life-changing events such as living away from home for the first

time and new social roles, but they are also experiencing increased academic expectations and time management challenges (Binfet et al., 2018).

This presents an interesting direction for future research on the pandemic, as it is necessary to examine the impact the pandemic has had on students including children and other groups of individuals more vulnerable to stress, to determine whether the pandemic has exacerbated the stress they already feel regularly, and whether, as a result, this means their mental health has deteriorated more than other groups of people who experience less stress. Overall, this study further supports and validates the Continuity Hypothesis, as this study has demonstrated that waking-day stressors of the pandemic are reflected in people's dreams (Erdelyi, 2017).

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