

# Illness attitudes, mood, and dreams during the second wave of the COVID-19 pandemic: An international study

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**Summary.** The Coronavirus Disease 2019 (COVID-19) has strongly impacted the world. Recent research on the pandemic has found a significant impact on sleep habits, dreaming, and psychological well-being. We investigated sociodemographic and COVID-19 related variables, attitudes toward illness (using the Illness Attitude Scale, or IAS), mood (using the Depression, Anxiety, and Stress Scale, or DASS-21), and oneiric activity (using participant's Most Recent Dream) during the second wave of the COVID-19 pandemic in a sample of 620 Italian, Canadian and Mexican adult subjects (79.9% women; ages 18-73 years,  $M = 27$ ,  $SD = 11.5$ ). Results indicated that: a) participants presented problematic scores of worries about illness and health habits, as well as moderate levels of depression, anxiety, and stress; b) female participants reported higher levels of negative illness attitudes, as well as higher levels of depression, anxiety, and stress; c) participants knowing a person who had the COVID-19 disease reported higher levels of stress, while participants knowing a COVID-19-related death reported higher levels of negative illness attitudes and higher levels of anxiety; d) participants reporting negative emotional tone in their dreams also reported higher levels of depression, anxiety, and stress; finally, e) the most represented emotional dream tone was negative, the most represented emotions in participants' dreams were anxiety and being scared, while the most represented actions were life or death situations. In sum, the findings of this study indicate that the COVID-19 lockdown measures, categorized as a catastrophic and traumatic event, significantly affected people's oneiric imagery in the three countries, in relation to some differences related to specific public health policies and different socioeconomic conditions, and that an integrative experimental and clinical perspective, including qualitative and quantitative analysis, as well as different theoretical approaches, could contribute to a more comprehensive analysis of dreaming.

**Keywords:** Illness attitudes, psychological well-being, dreams, continuity hypothesis, traumatic events

## 1. Introduction

The Coronavirus Disease 2019 (COVID-19) was declared a global pandemic by the World Health Organization on March 11th in 2020 (Cucinotta & Vanelli, 2020). Since then, data regarding infections and deaths all around the world have been steadily increasing, leading governments to adopt strong lockdown measures to reduce the spread of contagion. The suspension of teaching activities, the suspension of commercial retail activities (except for the sale of food and basic necessities), the closure of museums, the prohibition of all forms of gathering in public places, the suspension of all catering activities (including bars, pubs, etc.), the suspension of activities relating to personal services, and

the maximized use of remote work, have all resulted in a drastic form of social isolation which historically has never before been seen.

Italy, Mexico, and Canada are countries that were each affected by the pandemic with varying intensities. Responses to the spread of COVID-19 infections, both at the national and community levels, have been very different in each country, as have been the epidemiological consequences. Italy was hit harder than many countries in the beginning of the pandemic and has had roughly 45088.50 confirmed cases and 1550.12 deaths (per million) (situation in February 2021) (Worldometer, n.d.). Italy is also a country with a good welfare system and a political class, at both the regional and national level, significantly committed to the fight against COVID-19. In addition, Italy is one of the first European countries to have first started a massive vaccination campaign that sees 84.9% of the population having completed the three doses vaccination cycle (Statista, 2022), as well as one of the European countries with the strongest and longest lockdown measures during the first two waves of the pandemic. Mexico is increasingly becoming one of the most negatively impacted countries by the pandemic, and there have been roughly 15298.33 confirmed cases and 1337.36 deaths (per million) (situation in February 2021) (Worldometer, n.d.). Mexico's public health policy to con-

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front the pandemic was based on the 3 phases of transmission decreed by the WHO, following the premises of prevention, control, and mitigation, with 71.9% of the population being vaccinated (Statista, 2022). The sanitary measures established, while strict, never restricted individual mobility and no economic penalties were imposed. However, Mexico faced this contingency in conditions of vulnerability, among other factors due to the high prevalence of diabetes, obesity, and cardiovascular diseases, precarious labor conditions, problems of access to water and overcrowding, and multiple gaps in access to social rights, such as health, food, education, and housing. In Canada there have been roughly 21.779 confirmed cases and 574.29 deaths (per million) (situation in February 2021) (Worldometer, n.d.). Canada has become one of the leading countries in terms of speed of vaccination, with 79.93% of the population being fully vaccinated (Statista, 2022). While Italy initially had some of the harshest lockdown restrictions than any other countries, Canada has increasingly become more restrictive as well; Canada has typically had more harsh restrictions than many other countries throughout the pandemic, with some provinces in Canada going into lockdown more frequently and for longer periods of time in comparison with other countries (Passifume, 2022; Levinson-King, 2021). Like Mexico, these lockdowns, and other protective policies (such as the implementation of wearing masks indoors and shutting down schools) were put in place by the government to prioritize the safety of Canadian citizens (Loewen, 2021).

Additionally, one of the main focuses of the restrictions was aimed at not overloading the healthcare system, although this was rather unsuccessful as healthcare workers experienced extreme stress, burnout, and exhaustion (Paperny & Lampert, 2022). Indeed, the healthcare system became so overloaded that unrelated surgeries were either cancelled or pushed to a later time (Passifume, 2022). Life-saving and urgent surgeries were prioritized over non-life saving surgeries, but even life-saving surgeries tended to be delayed, causing many people not only some discomfort throughout their everyday lives, but also causing some severe distress over the fear that one may not live to receive their surgery necessary to keep them alive (Dudevich & Froot, 2021).

Moreover, economists hypothesize that inequality indicators, such as the Gini coefficient (Farris, 2010), measuring income and wealth distribution across a population (Italy = 35.9; Mexico = 45.4; Canada = 33.3; World Population Review, n.d.), can undergo a significant annual increase linked to the consequences of COVID-19, which would have further repercussions on the mental health of already disadvantaged populations (The World Bank, 2020).

The effects of the pandemic have affected all aspects of individual (at physical, psychological, economic, and relational level) and social lives, prompting international collaborative research to implement studies on the mental health of populations, as well as on psychosocial impact of the pandemic (e.g., Généreux et al., 2020).

The first international studies investigating the psychological consequences of the COVID-19 pandemic have shown that quarantine-isolation measures are associated with increased individual and relational psychological distress, anxiety, and depression (Benke et al., 2020; Casagrande et al., 2020; Forte et al., 2021; Généreux, et al., 2020; Huang & Zhao, 2020; Lima et al., 2020; Necho et al., 2021; Osorio-

Guzmán & Prado-Romero, 2021; Sommantico, 2010; Usher et al., 2020; Zurlo et al., 2020). It is, therefore, not excessive to define this period as traumatic, during which mental health services have recorded both a worsening of the symptoms of various individuals with prior struggles, and a generalized spread of anxiety and depression (Giallonardo et al., 2020; Rossi et al., 2020; World Health Organization, 2020).

Other characteristics shared by the COVID-19 pandemic that can lead to negative mental health outcomes in the population include feelings of fear, health concerns, and uncertainty about the future, along with additional stressors such as confusion, distrust of institutions, isolation, and grief related to possible losses. In addition, there is an unprecedented volume of media dissemination - through formal and informal channels and with various sources: e.g., policymakers, regional and national health organizations, experts - and consumption that may exacerbate the negative psychosocial impacts of the COVID-19 pandemic. (e.g., Généreux, 2020). Despite this, there is limited understanding of the differences between sociocultural contexts in psychological response to the COVID-19 pandemic.

Furthermore, findings in the literature of dream studies on populations subject to the restrictive measures related to the COVID-19 pandemic show that these events have a strong impact on dreams due to their emotional salience, which thereby influence dream content (Barrett, 2020; Gorgoni et al., 2021; Guerrero-Gomez et al., 2021; Iorio et al., 2020; Margherita et al., 2021; Mariani et al., 2021; Parrello et al., 2020; Pesonen et al., 2020; Scarpelli et al., 2021a; Scarpelli et al., 2021b; Schredl & Bulkeley, 2020; Sommantico et al., 2021a; Sommantico et al., 2021b). This has been found to ring true throughout the different waves of the pandemic, particularly when there are lockdown restrictions; as the pandemic progresses, dreams have become more emotionally intense, with more distressing and negative tones present in dreams from wave to wave of the pandemic, as well as an increased frequency of nightmares and nightmare distress (Scarpelli et al., 2021c; Sommantico et al., 2021b). Additionally, dreams tend to be less distressing in between waves of the pandemic, when people are not experiencing lockdown (Conte et al., 2021).

In particular, participants who experience COVID-19 more directly report higher emotional intensity in their dreams, characterized by a higher presence of sensory impressions (Barrett, 2020; Iorio et al., 2020; Parrello et al., 2020; Schredl & Bulkeley, 2020; Sommantico et al., 2021a). Furthermore, during the pandemic, dream imagery has been characterized by a high presence of virus-related themes, particularly by anxieties and concerns related to COVID-19 contagion (MacKay & DeCicco, 2020; Pesonen et al., 2020; Sommantico et al., 2021a).

More generally, dreams have been demonstrated to be reflective of waking day events. This theory is explained by the Continuity Hypothesis (the theory that waking day thoughts, experiences, and emotions are reflected in dream content; especially those that are particularly significant and/or distressing for the dreamer), which has gained support in connection to several waking day elements, such as gender, culture, and psychological well-being (Scarpelli et al., 2019; DeCicco, 2007; King & DeCicco, 2007; Pesant & Zadra, 2006). In particular, poorer physical health or functioning have been associated with dream imagery involving injuries and bodily symptoms, illness, and medical imagery,

and poorer psychological well-being has been associated with dream imagery, especially including sadness, anger, and aggression-related imagery (King & DeCicco, 2007; Sommantico et al., 2015). Furthermore, research findings indicated that health-related worries were associated with dream imagery involving the topic of health or illness, by demonstrating that both waking-day experiences and thoughts affect dream imagery (Schredl, Adam, Beckmann, & Petrova, 2016).

According to the Continuity Hypothesis, findings in the literature of dream studies related to war conflicts, catastrophic and/or traumatic events, as well as to waking concerns or threats, show that these events have a strong impact on dreams due to their emotional salience, thus influencing dream content (Barrett, 2001; Hartman & Basile, 2003; Rosen et al., 2006; Bradshaw et al., 2016; Davidson & Lynch, 2012; Mathes & Schredl, 2016). Furthermore, waking-day anxiety has often been associated with more anxiety dream content (Serpe & DeCicco, 2020). Dreams that include more scene changes and animals have also been found to be indicative of increased anxiety (DeCicco et al., 2013; Miller et al., 2015). More specifically, greater amounts of scene changes have been correlated with waking-day catastrophizing (Serpe & DeCicco, 2020).

## The Current Study: Aims and Hypotheses

Based on the previously mentioned literature, the current study aims to analyze illness attitudes, depression, anxiety, and stress in Italian, Canadian, and Mexican adults subject to the quarantine/isolation measures related to the second wave of the COVID-19 pandemic. Furthermore, we were interested in understanding if, and how, the COVID-19 pandemic was represented in dreams and dream imagery.

As demonstrated in previous studies, health concerns, as well as experiencing stressful events and psychological distress, have been associated with distinct dream imagery (e.g., Davidson & Lynch, 2012; Schredl et al., 2016). Therefore, and according to the Continuity Hypothesis, it was hypothesized that participants reporting more negative health attitudes, as well as higher levels of depression, anxiety, and stress in their waking life would report dreams that include more location changes and animal imagery because these have been linked to higher levels of anxiety in previous studies (DeCicco et al., 2013; Jones & DeCicco, 2009; Miller et al., 2015). The Continuity Hypothesis has been well documented in the research literature (e.g., DeCicco et al., 2013; McKay & DeCicco, 2020; Nielsen et al., 2003; Pesant & Zadra, 2006). Specific to this study, the Continuity Hypothesis applies to location change since people who are anxious have racing thoughts in the day and therefore, this is represented by constant location changes in dreams (e.g., Miller et al., 2015). Previous studies have provided evidence of animal imagery and higher scores of waking day anxiety as well (e.g., McKay & DeCicco, 2020; Miller et al., 2015). In addition, it was hypothesized that participants reporting more negative health attitudes, as well as higher levels of depression, anxiety, and stress, would report dreams that include virus or health-related imagery, as per the Continuity Hypothesis of dreaming. Finally, based on the previous dream research during the COVID-19 pandemic, it was hypothesized that the dreams of people living with quarantine/isolation measures were characterized by a high presence of virus-related themes, negative emotional tone and negative

emotions (such as anxiety and fear), especially related to dangerous situations (Barrett, 2020; Gorgoni et al., 2021; Iorio et al., 2020; Mariani et al., 2021; McKay & DeCicco, 2020; Parrello et al., 2021; Pesonen et al., 2020; Scarpelli et al., 2021; Schredl & Bulkeley, 2020; Sommantico et al., 2021a).

## 2. Method

### 2.1. Participants

There were 670 respondents (314 were Italian, 106 were Canadian, and 200 were Mexican), 50 of which did not report a dream, so were excluded from the study. The final sample consisted of 620 subjects (79.9% women; ages 18-73 years,  $M = 27$ ,  $SD = 11.5$ ). The sample had a high level of education, with 62.6% having completed secondary school, and 24.7% of participants having completed a university degree or a post-university degree. The majority of participants (63.1%) were students (29 employed and 8 unemployed or retired). 80.5% of participants knew someone who had been infected with the coronavirus disease, and 36% of participants knew someone who died of COVID-19 (for demographics see Table 1).

### 2.2. Measures

**Socio-demographic questionnaire.** Respondents provided socio-demographic data [e.g., age, gender, level of education, and profession] via a basic socio-demographic questionnaire. Respondents were also asked whether they knew people affected by, or who have died of, the COVID-19 virus.

**Most Recent Dream.** Participants were asked to report their Most Recent Dream (MRD; Domhoff, 1996) and to: a) describe the dream as fully as they could remember it; b) describe the setting of the dream, whether it was familiar or not; c) describe the people and their sex, age, and relationship to the dreamer; d) describe any animals or objects that appeared in the dream; e) describe their feelings during the dream and whether they were pleasant or unpleasant; f) tell exactly what happened during the dream to themselves and the other characters. Dream content was analyzed using the Hall and Van de Castle coding system (Hall & Van de Castle, 1966), which utilizes specific inclusion criteria for each dream category, thus ensuring that coding is objectively quantified. To be included in the dream category frequency score, the setting, character, action, or feeling must be clearly stated in the dream description, thus removing any subjectivity resulting from the rater's assumptions (Schneider & Domhoff, 2019; Domhoff, 2001). The dream categories included in the current analyses included: COVID-19 (including all virus-related imagery, such as: COVID-19, grocery store, personal protection equipment, coughing, isolation/quarantine, police control), food, characters, animals, location change, colors, settings, time, emotions, emotional tone (0 = negative; 1 = positive; 2 = neutral), and actions. The non-COVID-related dream categories were chosen because the Hall and Van De Castle coding system lists (1966) these ten categories as the main categories of analysis (e.g., Elce et al., 2021). The specific COVID-19 related categories are those that have been commonly found in the dreams of participants in other studies, to allow for a better comparison of the results of other studies with the current study, and they

are common occurrences in everyday life as a result of the pandemic (e.g., MacKay & DeCicco, 2020).

**Illness Attitude Scale.** The Illness Attitude Scale (IAS) (Kellner, 1987) is a 27-item self-report instrument, assessing illness attitudes on 9 subscales of 3 items each: a) Worry about illness (WI); b) Concerns about pain (CP); c) Health habits (HH); d) Hypochondriacal beliefs (HB); e) Thanatophobia (T); f) Disease phobia (DP); g) Bodily preoccupations (BP); h) Treatment experience (TE); and i) Effects of symptoms (ES). Participants are asked to respond according to a 5-point Likert-type scale (Ranging from 0 = “No”, to 4 = “Most of the time”). Questions 15a and 15b were added to provide further information but do not contribute to the scoring system. Subscale scores are calculated by summing the responses to the 3 items, and the total score is obtained by summing the scores of the 9 subscales. The highest score is 12 for each scale and 108 for the total score. In the original study (Kellner, 1987), test-retest statistics for the nine sub-scales were reported, while Cronbach’s  $\alpha$  were not reported. In the present study, Cronbach’s  $\alpha$  ranged between .69 and .88 for subscales, and was .90 for total score.

**Depression Anxiety Stress Scale – 21.** The Depression Anxiety Stress Scale – 21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report instrument assessing depression, anxiety, and stress on three subscales: a) Depression (7 items); b) Anxiety (7 items); and c) Stress (7 items). Participants are asked to rate the frequency and severity of depression, anxiety, and stress symptoms on a 4-point Likert-type scale (ranging from 0 = “Did not apply to me at all”, to 3 = “Applied to me very much, or most of the time”). Subscale scores are calculated by summing the responses to the seven items multiplied by 2 to suit the original 42 items. In the original study (Lovibond & Lovibond, 1995), Cronbach’s  $\alpha$  was .81 for Depression, .73 for Anxiety, and .81 for Stress. In the present study, Cronbach’s  $\alpha$  was respectively .91, .85, and .88.

2.3. Procedure

Participants were recruited via the Internet between December 2020 and February 2021, according to the following criteria: at least 18 years of age and compliant with the quarantine/isolation measures. All data were collected through self-report questionnaires, using an Internet-based survey (Hewson, Vogel, & Laurent, 2016). Participation in the study

Table 1. Descriptive Statistics for demographic, IAS, and DASS

|                                | Italy<br>(N = 314) |      | Canada<br>(N = 106) |      | Mexico<br>(N = 200) |      | Total sample<br>(N = 620) |      |
|--------------------------------|--------------------|------|---------------------|------|---------------------|------|---------------------------|------|
|                                | M/N                | SD/% | M/N                 | SD/% | M/N                 | SD/% | M/N                       | SD/% |
| Age                            | 28.4               | 12.2 | 26.2                | 11.7 | 25.1                | 9.8  | 27                        | 11.5 |
| Gender                         |                    |      |                     |      |                     |      |                           |      |
| Male                           | 63                 | 20.1 | 23                  | 21.7 | 53                  | 26.5 | 139                       | 22.4 |
| Female                         | 251                | 79.9 | 83                  | 78.3 | 147                 | 73.5 | 481                       | 77.6 |
| Education                      |                    |      |                     |      |                     |      |                           |      |
| Until middle school            | 15                 | 4.8  | 43                  | 40.6 | 21                  | 10.5 | 79                        | 12.7 |
| High school                    | 163                | 51.9 | 60                  | 56.6 | 165                 | 82.5 | 388                       | 62.6 |
| Graduate or more               | 136                | 43.3 | 3                   | 2.8  | 14                  | 7    | 153                       | 24.7 |
| Occupation                     |                    |      |                     |      |                     |      |                           |      |
| Student                        | 201                | 64.0 | 56                  | 52.8 | 134                 | 67.0 | 391                       | 63.1 |
| Employed                       | 90                 | 28.7 | 43                  | 40.6 | 47                  | 23.5 | 180                       | 29.0 |
| Unemployed or retired          | 23                 | 7.3  | 7                   | 6.6  | 19                  | 9.5  | 49                        | 7.9  |
| Knowing a COVID-19 Case        |                    |      |                     |      |                     |      |                           |      |
| Yes                            | 274                | 87.3 | 54                  | 50.9 | 171                 | 85.5 | 499                       | 80.5 |
| No                             | 40                 | 12.7 | 52                  | 49.1 | 29                  | 14.5 | 123                       | 19.5 |
| Knowing a COVID-19 Death       |                    |      |                     |      |                     |      |                           |      |
| Yes                            | 85                 | 27.1 | 15                  | 14.2 | 123                 | 61.5 | 223                       | 36.0 |
| No                             | 229                | 72.9 | 91                  | 85.8 | 77                  | 38.5 | 400                       | 64.0 |
| Worry about illness            | 7.1                | 2.4  | 6.1                 | 2.7  | 8.9                 | 2.5  | 7.5                       | 2.7  |
| Concerns about pain            | 5.8                | 2.5  | 4.8                 | 2.8  | 7.2                 | 2.6  | 6.1                       | 2.7  |
| Health habits                  | 6.6                | 2.6  | 7.3                 | 2.3  | 7.7                 | 2.5  | 7.1                       | 2.6  |
| Hypochondriacal beliefs        | 2.2                | 2.2  | 2.0                 | 2.2  | 3.1                 | 3.4  | 2.4                       | 2.7  |
| Thanatophobia                  | 5.5                | 3.2  | 3.6                 | 3.1  | 5.4                 | 3.9  | 5.1                       | 3.5  |
| Disease phobia                 | 3.9                | 2.8  | 2.2                 | 2.8  | 6.7                 | 3.7  | 4.6                       | 3.5  |
| Bodily preoccupations          | 4.8                | 2.4  | 3.7                 | 2.9  | 4.3                 | 2.9  | 4.4                       | 2.7  |
| Treatment experience           | 3.6                | 2.4  | 3.5                 | 2.3  | 4.0                 | 2.3  | 3.7                       | 2.4  |
| Effects of symptoms            | 3.6                | 2.7  | 3.5                 | 2.9  | 3.2                 | 3.1  | 3.5                       | 2.9  |
| Illness Attitude Scale (total) | 42.9               | 14.5 | 36.8                | 15.1 | 50.5                | 16.9 | 44.3                      | 16.2 |
| Depression                     | 17.7               | 10.2 | 16.1                | 11.6 | 14.2                | 12.3 | 16.3                      | 11.2 |
| Anxiety                        | 12.9               | 8.4  | 12.4                | 9.3  | 11.2                | 10.8 | 12.3                      | 9.5  |
| Stress                         | 21.5               | 8.9  | 18.2                | 10.3 | 17.3                | 11.0 | 19.6                      | 10.1 |

was voluntary, anonymous, and unpaid. All participants included in the study gave consent to participate on the first page of the survey. The informed consent included detailed information about the aims and procedures of the study, confidentiality, and the anonymity of the responses. Participants completed, in the following order: a socio-demographic questionnaire, the Most Recent Dream (MRD; Domhoff, 1996); the Illness Attitude Scale (IAS; Kellner, 1987), and the Depression Anxiety Stress Scale - 21 (DASS-21; Lovibond & Lovibond, 1995).

The study complied with the American Psychological Association (APA) ethical standards in the treatment of human research participants and conformed to the provisions of the 1964 Helsinki Declaration and its later amendments. Furthermore, the study was approved by the Ethical Committee of Psychological Research of the Department of Humanities of the University of Naples Federico II (prot. no. 30/2020), the Research Ethics Board of the University of Trent (prot. no 26472), and the Ethical Committee of the Faculty of Higher

Studies Iztacala of the National Autonomous University of Mexico (prot. no 1406).

#### 2.4. Statistical Analyses

Survey data were entered into SPSS version 23.0 (IBM Corp, 2015). Data were checked/verified by project staff for accuracy, to preserve the meaning-making process carried out by the researcher. Descriptive analyses were conducted to outline the sociodemographic characteristics of the sample, as well as the COVID-19 related variables, by considering the following features: age, gender, level of education, profession, and relationship to people affected by or died of COVID-19. The reliability analysis was computed using Cronbach's  $\alpha$  and was considered to be satisfactory if the values were greater than 0.70 (Nunnally & Bernstein, 1995). Correlations analyses were conducted by means of Pearson's coefficient ( $r$ ; between .10 and .29 = small association; between .30 and .49 = medium association; and > .50 = large association;  $p$ -value < .05). Group

Table 2. Descriptive Statistics of Most Recent Dreams

|                      | Italy<br>(N = 314) |       |       | Canada<br>(N = 106) |       |        | Mexico<br>(N = 200) |       |       | Total sample<br>(N = 620) |       |       |
|----------------------|--------------------|-------|-------|---------------------|-------|--------|---------------------|-------|-------|---------------------------|-------|-------|
|                      | Range              | M/N   | SD/%  | Range               | M/N   | SD/%   | Range               | M/N   | SD/%  | Range                     | M/N   | SD/%  |
| Dream length         | 1-417              | 47.96 | 60.13 | 3-757               | 81.14 | 113.72 | 1-132               | 20.23 | 21.18 | 1-757                     | 44.68 | 67.77 |
| COVID-19             | 0-5                | 0.35  | 0.81  | 0-7                 | 0.23  | 0.91   | 0-1                 | 0.02  | 0.14  | 0-7                       | 0.22  | 0.71  |
| Food                 | 0-4                | 0.07  | 0.39  | 0-2                 | 0.10  | 0.36   | 0-2                 | 0.03  | 0.19  | 0-4                       | 0.06  | 0.34  |
| Characters           | 1-10               | 2.68  | 1.85  | 1-11                | 2.87  | 1.87   | 1-5                 | 1.82  | 0.93  | 1-11                      | 2.44  | 1.67  |
| Animal               | 0-5                | 0.21  | 0.74  | 0-2                 | 0.14  | 0.42   | 0-1                 | 0.03  | 0.17  | 0-5                       | 0.14  | 0.57  |
| Location changes     | 0-14               | 0.90  | 1.81  | 0-4                 | 0.72  | 1.17   | 0-4                 | 0.27  | 0.72  | 0-14                      | 0.67  | 1.46  |
| Colors               | 0-3                | 0.04  | 0.28  | 0-3                 | 0.08  | 0.37   | 0-1                 | 0.01  | 0.10  | 0-3                       | 0.04  | 0.26  |
| Setting              |                    |       |       |                     |       |        |                     |       |       |                           |       |       |
| Indoor               | 0-1                | 144   | 45.9  | 0-1                 | 63    | 59.4   | 0-1                 | 46    | 23    | 0-1                       | 253   | 40.8  |
| Outdoor              | 0-1                | 150   | 47.7  | 0-1                 | 40    | 37.7   | 0-1                 | 58    | 29    | 0-1                       | 257   | 41.5  |
| Time                 |                    |       |       |                     |       |        |                     |       |       |                           |       |       |
| In the past          | 0-1                | 47    | 15    | 0-1                 | 7     | 6.6    | 0-1                 | 9     | 4.5   | 0-1                       | 63    | 10.2  |
| Emotions             |                    |       |       |                     |       |        |                     |       |       |                           |       |       |
| Anger                | 0-1                | 16    | 5.1   | 0-1                 | 13    | 12.3   | 0-1                 | 2     | 1     | 0-1                       | 31    | 5     |
| Sadness              | 0-1                | 37    | 11.8  | 0-1                 | 4     | 3.8    | 0-1                 | 4     | 2     | 0-1                       | 45    | 7.3   |
| Discomfort           | 0-1                | 45    | 14.3  | 0-1                 | 5     | 4.7    | 0-1                 | 6     | 3     | 0-1                       | 56    | 9     |
| Stress               | 0-1                | 13    | 4.1   | 0-1                 | 16    | 15.1   | 0-1                 | 8     | 4     | 0-1                       | 37    | 6     |
| Happiness            | 0-1                | 27    | 8.6   | 0-1                 | 13    | 12.3   | 0-1                 | 11    | 5.5   | 0-1                       | 51    | 8.2   |
| Scary                | 0-1                | 86    | 27.4  | 0-1                 | 14    | 13.2   | 0-1                 | 11    | 5.5   | 0-1                       | 111   | 17.9  |
| Relax                | 0-1                | 20    | 6.4   | 0-1                 | 7     | 6.6    | 0-1                 | 1     | 0.5   | 0-1                       | 28    | 4.5   |
| Anxiety              | 0-1                | 118   | 37.6  | 0-1                 | 7     | 6.6    | 0-1                 | 10    | 5     | 0-1                       | 135   | 21.8  |
| Confusion            | 0-1                | 26    | 8.3   | 0-1                 | 4     | 3.8    | 0-1                 | 6     | 3     | 0-1                       | 36    | 5.8   |
| Emotional tone       |                    |       |       |                     |       |        |                     |       |       |                           |       |       |
| Positive             | 0-1                | 30    | 9.6   | 0-1                 | 36    | 34     | 0-1                 | 55    | 27.5  | 0-1                       | 121   | 19.5  |
| Negative             | 0-1                | 194   | 61.8  | 0-1                 | 55    | 51.9   | 0-1                 | 104   | 52    | 0-1                       | 353   | 56.9  |
| Neutral              | 0-1                | 90    | 28.7  | 0-1                 | 15    | 14.2   | 0-1                 | 41    | 20.5  | 0-1                       | 146   | 23.5  |
| Actions <sup>1</sup> |                    |       |       |                     |       |        |                     |       |       |                           |       |       |
| Travel/vacation      | 0-1                | 46    | 14.6  | 0-1                 | 4     | 3.8    | 0-1                 | 16    | 8     | 0-1                       | 66    | 10.6  |
| Injury/symptoms      | 0-1                | 39    | 12.4  | 0-1                 | 12    | 11.3   | 0-1                 | 12    | 6     | 0-1                       | 63    | 10.2  |
| Aggression other     | 0-1                | 3     | 1     | 0-1                 | 11    | 10.3   | 0-1                 | 27    | 13.5  | 0-1                       | 41    | 6.6   |
| Someone dies         | 0-1                | 28    | 8.9   | 0-1                 | 3     | 2.8    | 0-1                 | 12    | 6     | 0-1                       | 43    | 6.9   |
| Being chased         | 0-1                | 25    | 8     | 0-1                 | 5     | 4.7    | 0-1                 | 14    | 7     | 0-1                       | 44    | 7.1   |
| Being trapped        | 0-1                | 21    | 6.7   | 0-1                 | 4     | 3.8    | 0-1                 | 6     | 3     | 0-1                       | 31    | 5     |
| Life death situation | 0-1                | 37    | 11.8  | 0-1                 | 8     | 7.5    | 0-1                 | 31    | 15.5  | 0-1                       | 76    | 12    |

differences were verified through ANOVA and Tukey tests ( $p$ -value  $< .05$ ). Effect sizes were measured through Eta-square ( $\eta^2$ ; small  $\geq .01$ ; medium  $\geq .059$ ; large  $\geq .138$ ) (Cohen, 1988). The chi-squared test with Bonferroni adjusted post hoc tests was used to compare male subsample versus female subsample's distributions of dream emotional tone ( $p$ -value  $< .05$ ). Multiple, linear, and ordinal regression analyses were conducted for outcome variables using standardized  $\beta$  coefficients and  $R^2$  coefficients ( $p$ -value  $< .05$ ).

### 3. Results

#### 3.1. Descriptive Statistics

Descriptive statistics for demographics, IAS, and DASS-21 are presented in Table 1. The mean for the IAS was 44.3 ( $SD = 16.2$ ). Only on two IAS subscales did participants present problematic scores: Worry about illness ( $M = 7.5$ ;  $SD = 2.7$ ) and Health habits ( $M = 7.1$ ;  $SD = 2.6$ ). The mean for Depression was 16.3 ( $SD = 11.2$ ); the mean for Anxiety was 12.3 ( $SD = 9.5$ ); and the mean for Stress was 19.6 ( $SD = 10.1$ ). According to the conventional cut-off scores for the DASS-21, participants presented moderate levels of depression, anxiety, and stress.

Descriptive statistics for MRDs are presented in Table 2. The mean dream length was 44.7 words ( $SD = 67.7$ ). The means for COVID-19, food, characters, animals, location changes, and colors were respectively: 0.22, 0.06, 2.44, 0.14, 0.67, and 0.04. The dream settings were both outdoor (41.5%) and indoor (40.8%). Only 10.2% of the dreams were set in the past. The most represented emotions in participants' dreams were anxiety (21.8%) and scary (17.9%), and the majority of participants reported a negative emotional dream tone (56.9%). Finally, the most represented actions in participants' dreams were life or death situations (12.3%), travel and/or vacation (10.6%), and injury/bodily symptoms (10.2%).

Several Chi<sup>2</sup> test for association were conducted between Country and MRDs categories. There was a strong, statistically significant association between Country and both indoor [ $\chi^2_{(2)} = 44.80$ ,  $p = .000$ ;  $\phi = 0.269$ ,  $p = .000$ ] and outdoor settings [ $\chi^2_{(2)} = 19.79$ ,  $p = .000$ ;  $\phi = 0.269$ ,  $p = .000$ ], as well as between Country and past settings [ $\chi^2_{(2)} = 16.44$ ,  $p = .000$ ;  $\phi = 0.163$ ,  $p = .000$ ]. Furthermore, there was a strong statistically significant association between Country and dream emotional tone [ $\chi^2_{(4)} = 44.71$ ,  $p = .000$ ;  $\phi = 0.269$ ,  $p = .000$ ], as well as between Country and some reported emotions: anger [ $\chi^2_{(2)} = 18.52$ ,  $p = .000$ ;  $\phi = 0.173$ ,  $p = .000$ ], sadness [ $\chi^2_{(2)} = 19.68$ ,  $p = .000$ ;  $\phi = 0.178$ ,  $p = .000$ ], discomfort [ $\chi^2_{(2)} = 21.99$ ,  $p = .000$ ;  $\phi = 0.188$ ,  $p = .000$ ], stress [ $\chi^2_{(2)} = 18.98$ ,  $p = .000$ ;  $\phi = 0.175$ ,  $p = .000$ ], scary/being scared, [ $\chi^2_{(2)} = 41.75$ ,  $p = .000$ ;  $\phi = 0.259$ ,  $p = .000$ ], and anxiety [ $\chi^2_{(2)} = 93.41$ ,  $p = .000$ ;  $\phi = 0.388$ ,  $p = .000$ ]. Finally, there was a statistically significant association between Country and some reported actions: travel/vacation [ $\chi^2_{(2)} = 12.03$ ,  $p = .002$ ;  $\phi = 0.139$ ,  $p = .000$ ], injury/bodily symptoms [ $\chi^2_{(2)} = 5.27$ ,  $p = .022$ ;  $\phi = 0.110$ ,  $p = .022$ ], and aggression toward others [ $\chi^2_{(2)} = 34.07$ ,  $p = .000$ ;  $\phi = 0.234$ ,  $p = .000$ ].

#### 3.2. Correlations and Group Differences

Zero-order correlations for total sample are shown in Table 3. Results indicated that IAS subscales and total score were significantly correlated with Depression, Anxiety, and

Stress [ $r(618)$  ranging from  $-.11$  ( $p < .05$ ) to  $.42$  ( $p < .01$ )]. Furthermore, results indicated that dream length was significantly positively correlated with Depression and Stress [ $r(618) = .12$  and  $.12$ ;  $p < .01$ ] and that dream length was significantly positively correlated with several dream categories: COVID-19 [ $r(618) = .24$ ;  $p < .01$ ]; characters [ $r(618) = .56$ ;  $p < .01$ ]; food [ $r(618) = .14$ ;  $p < .05$ ]; animals [ $r(618) = .14$ ;  $p < .01$ ]; colors [ $r(618) = .27$ ;  $p < .01$ ]; and location change [ $r(618) = .69$ ;  $p < .01$ ].

ANOVA and Tukey tests showed significant differences (see Table 4). Indeed: female participants reported significantly higher levels of IAS, Depression, Anxiety, and Stress, as well as the longest dreams; Mexican participants reported significantly higher levels of IAS, while Italian participants reported significantly higher levels of Depression and Stress, as well as higher presence of COVID-19 imagery, animals, and location changes; Canadian participants reported significantly longer dreams and a higher presence of characters; participants personally knowing someone with the COVID-19 virus reported significantly higher levels of Stress, as well as having the shortest dreams; participants personally knowing a COVID-19-related death reported significantly higher levels of IAS and Anxiety, as well as shortest dreams, lower presence of COVID-19 imagery lower presence of characters, and lower presence of location changes; student participants reported significantly higher levels of IAS, Depression, and Anxiety; finally, participants reporting negative dream emotional tone also reported significantly higher levels of Depression, Anxiety, and Stress, as well as longest dreams, higher presence of COVID-19 imagery, higher presence of characters, and higher presence of location changes.

Finally, statistical comparisons via chi-squared test with Bonferroni adjusted post hoc tests showed that the distribution of dream recall frequency in the male subsample differs significantly from that of the female subsample:  $\chi^2_{(2)} = 7.04$ ,  $p = .022$ . In particular, in the female subsample, we observe a significantly higher percentage of participants reporting dreams' negative emotional tone (Bonferroni adjusted  $\alpha$  levels of .0010 per test .05/6).

#### 3.3. Regression Analyses

Based on previous results, hierarchical multiple regressions were run to determine if the addition of knowing a person who had the COVID-19 virus as well as knowing a COVID-19-related death improved the prediction of illness attitudes, depression, anxiety, and stress over and above age and gender alone (see Table 5). The full model of age, gender, knowing a COVID-19 case, and knowing a COVID-19 death to predict illness attitudes was statistically significant,  $R^2 = .107$ ,  $F_{(4, 615)} = 18.34$ ,  $p < .001$ ; adjusted  $R^2 = .101$ . The addition of knowing a COVID-19 case to the prediction of illness attitudes did not lead to a statistically significant increase in  $R^2$ . The addition of knowing a COVID-19 death to the prediction of illness attitudes led to a statistically significant increase in  $R^2$  of .040,  $F_{(1, 615)} = 27.57$ ,  $p < .001$ . The full model of age, gender, knowing a COVID-19 case, and knowing a COVID-19 death to predict depression was statistically significant  $R^2 = .035$ ,  $F_{(4, 615)} = 5.49$ ,  $p < .001$ ; adjusted  $R^2 = .028$ , but neither the addition of knowing a COVID-19 case, nor the addition of knowing a COVID-19 death led to a statistically significant increase in  $R^2$ . The full model of age, gender, knowing a COVID-19 case, and knowing a COVID-19 death to predict anxiety was statistically significant,

Table 3. Zero-order correlations

|                  | 1      | 2      | 3     | 4     | 5     | 6     | 7      | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17   | 18    | 19    | 20    |
|------------------|--------|--------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| 1. Age           | -      |        |       |       |       |       |        |       |       |       |       |       |       |       |       |       |      |       |       |       |
| 2. WI            | -.20** | -      |       |       |       |       |        |       |       |       |       |       |       |       |       |       |      |       |       |       |
| 3. CP            | -.19** | .64**  | -     |       |       |       |        |       |       |       |       |       |       |       |       |       |      |       |       |       |
| 4. HH            | -.02   | .31**  | .29** | -     |       |       |        |       |       |       |       |       |       |       |       |       |      |       |       |       |
| 5. HB            | -.08   | .33**  | .38** | .17** | -     |       |        |       |       |       |       |       |       |       |       |       |      |       |       |       |
| 6. T             | -.20** | .52**  | .48** | .12** | .37** | -     |        |       |       |       |       |       |       |       |       |       |      |       |       |       |
| 7. DP            | -.18** | .58**  | .52** | .12** | .42** | .51** | -      |       |       |       |       |       |       |       |       |       |      |       |       |       |
| 8. BP            | -.15** | .37**  | .50** | .06   | .39** | .46** | .40**  | -     |       |       |       |       |       |       |       |       |      |       |       |       |
| 9. TE            | -.02   | .26**  | .33*  | .13** | .22** | .20** | .16**  | .21** | -     |       |       |       |       |       |       |       |      |       |       |       |
| 10. ES           | -.12** | .19**  | .21** | -.01  | .31** | .23** | .22**  | .41** | .26** | -     |       |       |       |       |       |       |      |       |       |       |
| 11. IAS-TOT      | -.21** | .75**  | .77** | .37** | .63** | .72** | .73**  | .67** | .46** | .50** | -     |       |       |       |       |       |      |       |       |       |
| 12. Depression   | -.16** | .06    | .10*  | -.11* | .14** | .21** | .13**  | .25** | .10*  | .41** | .23** | -     |       |       |       |       |      |       |       |       |
| 13. Anxiety      | -.15** | .19**  | .18** | -.04  | .23** | .29** | .22**  | .33** | .20** | .42** | .36** | .65** | -     |       |       |       |      |       |       |       |
| 14. Stress       | -.13** | .15**  | .15** | -.07  | .15** | .26** | .16**  | .30** | .14** | .37** | .29** | .77** | .72** | -     |       |       |      |       |       |       |
| 15. Dream length | -.05   | -.11** | -.04  | -.06  | -.04  | -.05  | -.16** | .03   | .05   | .07   | -.06  | .12** | .03   | .12** | -     |       |      |       |       |       |
| 16. COVID-19     | -.01   | -.02   | -.06  | .02   | -.04  | -.02  | -.06   | -.00  | -.00  | .04   | -.03  | .02   | -.02  | .07   | .24** | -     |      |       |       |       |
| 17. NFood        | -.06   | -.07   | -.09* | -.06  | -.02  | -.02  | -.07   | -.04  | -.04  | -.06  | -.07  | -.03  | -.02  | -.03  | .14*  | .02   | -    |       |       |       |
| 18. NCharacters  | -.06   | -.06   | -.06  | -.05  | -.05  | .02   | -.11** | .05   | .07   | .09*  | -.02  | .13** | .06   | .12** | .56** | .21** | .09* | -     |       |       |
| 19. NAnimals     | -.02   | -.08   | -.06  | -.05  | -.09* | -.03  | -.06   | -.04  | -.05  | -.01  | -.08* | .08   | .02   | .06   | .14** | -.01  | -.02 | .25   | -     |       |
| 20. NLChanges    | -.00   | -.11** | -.03  | -.04  | -.04  | -.01  | -.08   | .03   | .04   | .04   | -.03  | .10*  | -.00  | .10*  | .69** | .18** | .09* | .47** | .16** | -     |
| 21. NColors      | -.00   | -.01   | -.01  | .08*  | -.00  | -.04  | -.06   | -.01  | .02   | -.01  | -.01  | -.05  | -.05  | -.03  | .27** | .04   | .03  | .08*  | .06   | .16** |

Note. \*p < .05; \*\*p < .01.

Table 4. ANOVA

| Gender                   | F        | M        | F (gl)                 | p              | η <sup>2</sup> |                |
|--------------------------|----------|----------|------------------------|----------------|----------------|----------------|
| IAS                      | 45.5     | 40.4     | 10.80 (1, 618)         | .001           | .02            |                |
| Depression               | 16.8     | 14.6     | 4.09 (1, 618)          | .043           | .01            |                |
| Anxiety                  | 13.0     | 9.7      | 13.66 (1, 618)         | .000           | .02            |                |
| Stress                   | 20.4     | 16.7     | 14.95 (1, 618)         | .000           | .02            |                |
| Dream length             | 47.9     | 33.6     | 4.84 (1, 618)          | .028           | .01            |                |
| Country                  | Italy    | Canada   | Mexico                 | F (gl)         | p              | η <sup>2</sup> |
| IAS                      | 42.9     | 36.8     | 50.5                   | 29.90 (1, 617) | .000           | .09            |
| Depression               | 17.7     | 16.1     | 14.2                   | 5.98 (1, 617)  | .003           | .02            |
| Stress                   | 21.5     | 18.2     | 17.3                   | 12.22 (1, 617) | .000           | .04            |
| COVID-19 imagery         | 0.4      | 0.2      | 0.0                    | 13.62 (1, 617) | .000           | .04            |
| Animals                  | 0.2      | 0.1      | 0.0                    | 6.08 (1, 617)  | .002           | .02            |
| Location change          | 0.9      | 0.7      | 0.3                    | 11.96 (1, 617) | .000           | .04            |
| Characters               | 2.7      | 2.9      | 1.8                    | 22.21 (1, 617) | .000           | .07            |
| Dream length             | 47.9     | 81.1     | 20.2                   | 31.57 (1, 617) | .000           | .09            |
| Knowing a COVID-19 case  | Yes      | No       | F (gl)                 | p              | η <sup>2</sup> |                |
| Stress                   | 19.9     | 17.8     | 4.64 (1, 618)          | .032           | .01            |                |
| Dream length             | 40.4     | 62.2     | 10.18 (1, 618)         | .001           | .02            |                |
| Knowing a COVID-19 death | Yes      | No       | F (gl)                 | p              | η <sup>2</sup> |                |
| IAS                      | 48.8     | 41.8     | 27.45 (1, 618)         | .000           | .03            |                |
| Anxiety                  | 13.6     | 11.5     | 6.93 (1, 618)          | .009           | .01            |                |
| COVID-19 imagery         | 0.1      | 0.3      | 9.15 (1, 618)          | .003           | .02            |                |
| Location change          | 0.5      | 0.8      | 7.59 (1, 618)          | .001           | .02            |                |
| Characters               | 2.2      | 2.6      | 10.44 (1, 618)         | .001           | .02            |                |
| Dream length             | 28.7     | 53.7     | 20.05 (1, 618)         | .000           | .03            |                |
| Occupation               | Student  | Employed | Unemployed/<br>retired | F (gl)         | p              | η <sup>2</sup> |
| IAS                      | 46.2     | 41.0     | 41.4                   | 7.59 (1, 617)  | .001           | .02            |
| Depression               | 17.1     | 14.6     | 16.2                   | 3.03 (1, 617)  | .049           | .01            |
| Anxiety                  | 13.4     | 11.9     | 10.3                   | 3.81 (1, 617)  | .023           | .01            |
| Dream emotional tone     | Negative | Positive | Neutral                | F (gl)         | p              | η <sup>2</sup> |
| Depression               | 17.6     | 14.2     | 14.9                   | 5.81 (1, 617)  | .003           | .02            |
| Anxiety                  | 13.6     | 10.7     | 10.3                   | 8.23 (1, 617)  | .000           | .03            |
| Stress                   | 21.1     | 17.1     | 18.0                   | 9.81 (1, 617)  | .000           | .03            |
| COVID-19 imagery         | 0.3      | 0.1      | 0.1                    | 5.01 (1, 617)  | .007           | .02            |
| Location change          | 0.9      | 0.4      | 0.4                    | 9.45 (1, 617)  | .000           | .03            |
| Characters               | 2.6      | 2.2      | 2.1                    | 5.75 (1, 617)  | .003           | .02            |
| Dream length             | 51.9     | 37.9     | 32.9                   | 4.87 (1, 617)  | .008           | .02            |

$R^2 = .057$ ,  $F_{(4, 615)} = 9.34$ ,  $p < .001$ ; adjusted  $R^2 = .051$ . The addition of knowing a COVID-19 case to the prediction of anxiety did not lead to a statistically significant increase in  $R^2$ . The addition of knowing a COVID-19 death to the prediction of anxiety led to a statistically significant increase in  $R^2$  of .011,  $F_{(1, 615)} = 6.99$ ,  $p < .01$ . Finally, The full model of age, gender, knowing a COVID-19 case, and knowing a COVID-19 death to predict stress was statistically significant,  $R^2 = .050$ ,  $F_{(4, 615)} = 8.01$ ,  $p < .001$ ; adjusted  $R^2 = .043$ . The addition of knowing a COVID-19 case to the prediction of stress led to a statistically significant increase in  $R^2$  of .049,  $F_{(1, 615)} = 5.92$ ,  $p < .01$ . The addition of knowing a COVID-19 death to the prediction of stress did not lead to a statistically significant increase in  $R^2$ .

The dependent dream categories were also compared to gender, relationship to people affected by COVID-19, and relationship to people who have died of COVID-19 as independent variables (see Table 6). Several significant causal relationships were found. In particular: a) female participants reported having the longest dreams, mainly with a negative

emotional dream tone, as well as more sadness and anxiety in their dreams; b) participants personally knowing someone with the COVID-19 virus reported having the longest dreams and more anxiety in their dreams; finally, c) participants knowing a COVID-19- related death also reported having the longest dreams, a higher presence of COVID-19 references, more characters, location changes, indoor and outdoor settings, past settings, and they reported a higher presence of emotions including anger, being scared, and anxiety in their dreams.

#### 4. Discussion

The present study aimed to analyze sociodemographic and Beyond collecting data from the IAS and DASS-21, the current study also examined the MRDs reported by Italian, Canadian, and Mexican adults during the second wave of the COVID-19 pandemic. The results of this study are consistent with recent studies on psychological well-being during the time of COVID-19 (e.g., Benke et al., 2020; Casagrande et al., 2020; Coiro, Asraf, Tzischinsky, Hadar-Shoval, Tannous-



Table 5. Hierarchical multiple regression analysis for IAS-TOT, Depression, Anxiety, and Stress

| Scale                     | Italy (N = 314) |                       |              | Canada (N = 106) |                       |              | Mexico (N = 200) |                       |              | Total sample (N = 620) |                       |              |
|---------------------------|-----------------|-----------------------|--------------|------------------|-----------------------|--------------|------------------|-----------------------|--------------|------------------------|-----------------------|--------------|
|                           | <i>B</i>        | <i>R</i> <sup>2</sup> | $\Delta R^2$ | <i>B</i>         | <i>R</i> <sup>2</sup> | $\Delta R^2$ | <i>B</i>         | <i>R</i> <sup>2</sup> | $\Delta R^2$ | <i>B</i>               | <i>R</i> <sup>2</sup> | $\Delta R^2$ |
| <b>IAS-TOT</b>            |                 |                       |              |                  |                       |              |                  |                       |              |                        |                       |              |
| 1. Age, Gender            | -.154           | .029                  | .029**       | -.350            | .147                  | .147**       | -.493            | .105                  | .105**       | -.296                  | .062                  | .062**       |
| 2. Knowing COVID-19 case  | -.153           | .033                  | .004         | -.360            | .151                  | .004         | -.526            | .126                  | .021*        | -.298                  | .005                  | .071         |
| 3. Knowing COVID-19 death | -.169           | .039                  | .007         | -.355            | .168                  | .018         | -.524            | .141                  | .015         | -.308                  | .107                  | .040**       |
| <b>DEPRESSION</b>         |                 |                       |              |                  |                       |              |                  |                       |              |                        |                       |              |
| 1. Age, Gender            | -.167           | .040                  | .040**       | -.205            | .044                  | .044**       | -.174            | .051                  | .051*        | -.160                  | .033                  | .033**       |
| 2. Knowing COVID-19 case  | -.167           | .040                  | .000         | -.222            | .066                  | .021         | -.200            | .076                  | .025*        | -.161                  | .034                  | .001         |
| 3. Knowing COVID-19 death | -.250           | .044                  | .004         | -.223            | .069                  | .004         | -.200            | .081                  | .004         | -.161                  | .035                  | .000         |
| <b>ANXIETY</b>            |                 |                       |              |                  |                       |              |                  |                       |              |                        |                       |              |
| 1. Age, Gender            | -.142           | .047                  | .047**       | -.133            | .048                  | .048         | -.109            | .060                  | .060*        | -.127                  | .046                  | .046**       |
| 2. Knowing COVID-19 case  | -.142           | .047                  | .000         | -.145            | .064                  | .016         | -.135            | .091                  | .030*        | -.128                  | .047                  | .001         |
| 3. Knowing COVID-19 death | -.162           | .080                  | .033**       | -.145            | .064                  | .001         | -.134            | .103                  | .012         | -.131                  | .057                  | .011*        |
| <b>STRESS</b>             |                 |                       |              |                  |                       |              |                  |                       |              |                        |                       |              |
| 1. Age, Gender            | -.168           | .064                  | .064**       | -.094            | .022                  | .022         | -.081            | .048                  | .048*        | -.113                  | .040                  | .040**       |
| 2. Knowing COVID-19 case  | -.168           | .066                  | .002         | -.101            | .027                  | .005         | -.113            | .092                  | .044*        | -.114                  | .049                  | .009*        |
| 3. Knowing COVID-19 death | -.178           | .072                  | .006         | -.103            | .032                  | .006         | -.112            | .093                  | .001         | -.114                  | .050                  | .000         |

Note: \*  $p < .01$ ; \*\*  $p < .001$ .

Haddad, & Wolfson, 2021; Forte et al., 2021; Huang & Zhao, 2020; Osorio-Guzmán & Prado-Romero, 2021; Zurlo et al., 2020). Indeed, participants of the current study reported moderate levels of depression, anxiety, and stress, as well as reported problematic levels of worries about illness and health habits. According to previous research on the effects of the Covid-19 pandemic on mental health (e.g., Génèreux et al., 2020; Salari et al., 2020), female participants were

particularly more distressed, as they reported higher levels of fears of contracting illnesses and higher levels of depression, anxiety, and stress.

There are several possible explanations for these findings. According to Piumatti and colleagues (2022), it is also possible to hypothesize that female participants are at greater risk for mental health problems because they have had to take on more childcare than males, having thus been se-

Table 6. Regression analyses for dream variables

| Scale                         | Effect of gender |            |          | Effect of knowing a COVID-19 case |            |          | Effect of knowing a COVID-19 death |            |          |
|-------------------------------|------------------|------------|----------|-----------------------------------|------------|----------|------------------------------------|------------|----------|
|                               | <i>B</i>         | $\chi^2/t$ | <i>p</i> | <i>B</i>                          | $\chi^2/t$ | <i>p</i> | <i>B</i>                           | $\chi^2/t$ | <i>p</i> |
| Dream length <sup>2</sup>     | .088             | 2.20       | .028*    | .127                              | 3.19       | .001**   | .177                               | 4.48       | .000**   |
| COVID-19 <sup>2</sup>         | .027             | 0.66       | .506     | .029                              | 0.72       | .472     | .121                               | 3.03       | .003*    |
| Characters <sup>2</sup>       | .061             | 1.53       | .127     | .010                              | 0.26       | .794     | .129                               | 3.23       | .001**   |
| Location changes <sup>2</sup> | .029             | 0.71       | .477     | .003                              | 0.08       | .934     | .110                               | 2.75       | .006*    |
| Indoor settings <sup>1</sup>  | .004             | 2.32       | .128     | .005                              | 3.13       | .077     | .023                               | 14.27      | .000*    |
| Outdoor settings <sup>1</sup> | .000             | 0.07       | .787     | .000                              | 0.03       | .862     | .011                               | 6.95       | .008*    |
| In the past <sup>1</sup>      | .000             | 0.07       | .781     | .001                              | 0.62       | .431     | .008                               | 4.77       | .029*    |
| Emotional tone <sup>1</sup>   | .007             | 4.30       | .038*    | .000                              | 0.00       | .958     | .000                               | 0.00       | .976     |
| Anger <sup>1</sup>            | .003             | 1.91       | .167     | .003                              | 1.71       | .191     | .007                               | 4.29       | .038*    |
| Sadness <sup>1</sup>          | .010             | 6.15       | .013*    | .000                              | 0.22       | .639     | .005                               | 2.96       | .085     |
| Scary <sup>1</sup>            | .005             | 3.17       | .075     | .001                              | 0.37       | .541     | .011                               | 7.08       | .008*    |
| Anxiety <sup>1</sup>          | .008             | 4.98       | .026*    | .011                              | 7.06       | .008*    | .013                               | 7.85       | .005*    |

Note: *B* = Standardized estimates; <sup>1</sup>Ordinal regression ( $\chi^2$  values); <sup>2</sup>Linear regression (*t* values).

verely affected by school and daycare closures, and having had to rely more on home-based work during periods of closure and quarantine (e.g., García-Fernández et al., 2020; Piumatti et al., 2022). In the same vein, as indicated by previous investigations (e.g., Amanullah, 2020; Dillon et al., 2022; Janson et al., 2021), women also tend to be the caregivers of family members in need (particularly elders), so they are likely more exposed directly to the virus than men tend to be, and/or are likely to be more anxious about passing the virus along to their more vulnerable loved ones.

Consistent with previous research on dreams (e.g., Nielsen et al., 2000; Schredl et al., 2014; Schredl & Reinhard, 2011; Settineri et al., 2019), as well as with recent studies on dreaming in the time of COVID-19 (e.g., Barrett, 2020; Iorio et al., 2020; MacKay & DeCicco, 2020; Parrello et al., 2021; Pesonen et al., 2020; Scarpelli et al., 2021; Schredl & Bulkeley, 2020), female participants also reported the longest dreams and a predominantly negative emotional tone in their dreams.

Furthermore, and consistent with previous research on students' wellbeing during the COVID-19 pandemic (Padrón et al., 2021; Saravanan et al., 2020; Shala et al., 2021; Zurlo et al., 2020; Wang et al., 2020), student participants reported significantly higher levels of negative illness attitudes, depression, and anxiety. Indeed, we can hypothesize that the fear of the COVID-19 infection, lockdown, and implementation of online classes may have led to stress, anxiety, and other emotional problems particularly among students whose lives dramatically changed at both academic, social, and personal levels. In addition, we can hypothesize that these findings are related to the type of information and the perspective spread by mass media during the COVID-19 pandemic, emphasizing that adolescents and young adults could be one of the first sources of infection for their grandparents, thus putting undue pressure on them. This could also be related to the explanation as to why female participants tended to have higher levels of fears of contracting illnesses and higher levels of depression, anxiety, and stress and more negative emotional dream tones. Indeed, many of the students in this study were women.

The findings of this study that Mexican participants reported significantly more fears of contracting illnesses, while Italian participants reported significantly higher levels of depression and stress, suggest that people living in countries that were hit harder by the virus tend to be experiencing more emotional distress and fears about contracting the virus. In interpreting these findings, we can also hypothesize an effect related to previous conditions of vulnerability present in different countries. In particular, the fact that Mexico has, among other things, a high prevalence of diabetes, obesity, and cardiovascular disease, as well as problems of access to water and overcrowding, together with a gap in access to health services, could partially explain the higher scores of negative illness attitudes. At the same time, Mexico has not only been experiencing a drastic increase of COVID-19 virus infections, and while Italy, Canada, and Mexico had all just begun to administer vaccines to their most at-risk populations, Mexico was also struggling to obtain enough vaccines due to other countries (such as Canada and the United States) buying a large portion of the vaccines, which is therefore slowing the process of vaccine administration, which could increase fear among the people that they may contract the virus before they are able to be vaccinated (Rivers & Gallón, 2021).

Furthermore, Italy was one of the first countries in the world to experience strong and long lockdown measures, so they were one of the first groups of people across the world to experience such an extreme force of isolation, leading to higher rates of depression and stress (Rania et al., 2021). However, Canada quickly joined Italy in being one of the countries with the most intense restrictions, as Canada began to experience longer and more frequent lockdowns than many other countries (i.e., Toronto, Ontario is reported to have had one of the longest lockdowns in the world), and while many people were in support of these measures because they care about protecting their loved ones and vulnerable populations, some people were in uproar over the restrictions and lockdowns, with many people protesting these mandates, claiming the mandates are an infringement of their freedom and rights (e.g., Browne, 2021; Levinson-King, 2021; Passifiume, 2022). However, despite all of this, Canadians still had lower levels of depression than Italians.

This could be partially related to the fact that, since Italy was one of the first countries in the world to go through such intense measures, they may have, in a sense, prefaced what it would be like for the rest of the world, so the rest of the world, including Canada and Mexico, had more time to mentally prepare for what a lockdown might be like, whereas Italians were shocked into unexpected extreme isolation. Canada did score higher levels of depression than Mexico, which may be partially explained by Canada's climate conditions; this study was administered during winter, and while Mexico typically has a warmer climate throughout the year, Canada's winters tend to be extremely cold, snowy, and dark (e.g., Barbezat, 2020). For the darkest months of winter in Canada (in the parts of Canada that this study was conducted), the sun does not rise until about 8:00am and the sun sets very early, around 4:30 or 5:00pm. Often, people go to work in the dark and come home in the dark, getting to experience very little sunlight throughout these months.

This lack of exposure to sunlight for a long period of time, and general gloominess of the season, can cause seasonal affective disorder (SAD) in many individuals, where people feel low energy and moody/down most of the day, throughout the winter season. Many people do not experience the full effects of SAD, but still experience a milder version of it, called the winter blues, in which they may lose interest in activities they once enjoyed, they feel hopeless, and have difficulty concentrating (e.g., Galima et al., 2020). Therefore, the isolated aspect of the pandemic may be exaggerated in Canadians since many Canadians already naturally feel a bit low around the time of year that this study was conducted. Overall, these findings demonstrate the negative impact the pandemic has had on people's mental health, especially for those in countries that do not have as many resources to properly deal with the virus, and for those forced into social isolation.

In sum, we can interpret these findings by hypothesizing an effect related to the different stages of the pandemic in the three countries, as well as to the very different political, social, and economic backgrounds, while also considering specific stressors such as threat perceived for oneself, family, or friends, mistrust in authorities, threat perceived for country or world, as well as financial and emotional losses. Moreover, the results of this study indicated that participants who have been personally affected by COVID-19 reported significantly higher levels of poor sleep quality, participants personally knowing someone infected with the COVID-19

virus reported significantly higher levels of stress, and participants personally knowing a COVID-19-related death reported significantly higher levels of negative illness attitudes and anxiety. These results suggest that being more personally affected by the COVID-19 pandemic has negative consequences on individuals' psychological well-being.

The results of this study are also consistent with recent studies on dreaming during the time of COVID-19 (Barrett, 2020; Conte et al., 2021; Gorgoni et al., 2021; Guerrero-Gomez et al., 2021; Iorio et al., 2020; Mariani et al., 2021; Parrello et al., 2020; Pesonen et al., 2020; Scarpelli et al., 2021; Schredl & Bulkeley, 2020; Sommantico et al., 2021). Indeed, participants reporting negative emotional tone in their dreams also reported higher levels of waking-day depression, anxiety, and stress. Moreover, the most represented dream emotional tone was negative, the most represented emotions in participants' dreams were anxiety and feeling scared, while the most represented actions were life/death situations. According to the transformative function of dreams and dreaming (e.g., Fosshage, 1983; Margherita et al., 2021; Sommantico, 2018), these results suggest that being personally affected by, knowing people affected by, or knowing people who have died of COVID-19, this type of emotional distress could express itself in dreams characterized by a high negative emotional intensity. This data is also in line with both the continuity hypothesis of dreaming and waking life especially as applied to catastrophic events, as well as classical psychoanalytic theory, according to which significant events in waking life can be associated with dreamt emotions (Barrett, 2001; Hartmann & Basile, 2003; Rosen et al., 1991; Schredl, 2006; Sommantico, 2016; Freud, 1900). Indeed, according to psychoanalytic thinking (Adams-Silvan & Silvan, 1990; Freud, 1915-17; Sommantico, 2016; Sommantico, 2018; Velotti & Zavattini, 2019), dreams can be interpreted, not only as an attempt at the fulfillment of repressed wishes, but also as a way to retrospectively master and transform a waking life traumatic event.

In this vein, we can also hypothesize that the above socio-economic differences in the three countries, which undoubtedly also characterize different ways of coexistence with COVID-19, require different processes of elaboration of the traumatic experience.

## 5. Limitations and Future Research

This study presents several limitations: a) convenience sampling, or sampling from a part of the population that is easily accessible to the researcher, implies possible biases, such as volunteer bias (related to the special characteristics of individuals who voluntarily participate in a study in comparison to those that do not participate in a study); our sample was not balanced with respect to gender, as more women than men participated in this study; c) the lack of data on participants' oneiric lives prior to the onset of the COVID-19 pandemic prevents comparisons (Etikan et al., 2016). Previous limitations and the cross-sectional study design limit the generalizability of results, as well as conclusions that can be drawn.

## 6. Conclusion

The present study was conducted during the second wave of the COVID-19 pandemic in Italy, Canada, and Mexico, when mass media continuously communicated the increas-

ing number of contagions and deaths, by reminding audiences of the obligation to practice isolation and social distancing.

Results of the present study highlight the severe impact of the COVID-19 pandemic on individuals' psychological well-being, especially in terms of negative illness attitudes, depression, anxiety, and stress, thus indicating the need for psychological interventions aimed to face with mental health problems of the global population, also considering the different health and social policy of the different countries.

According to the continuity hypothesis of dreaming and the psychoanalytic theory, results also show how a catastrophic event, such as the COVID-19 pandemic, can affect oneiric life, by appearing in dreams both directly, through explicit references to the virus and its correlates, as well as through negative emotions related to stressful situations.

In summary, this study demonstrates how the integration of experimental and clinical perspectives, including both qualitative and quantitative analyses, when combined with different theoretical approaches, such as the continuity hypothesis and the psychoanalytic framework, contributes to a deeper and comprehensive analysis of dreams and dreaming.

## References

- Adams-Silvan, A., & Silvan, M. (1990). "A dream is the fulfillment of a wish": Traumatic dream, repetition compulsion, and the pleasure principle. *The International Journal of Psychoanalysis*, 71, 513-522.
- Amanullah, S., Vithianathan, A., Snelgrove, N., Ghuloum, S., & Shivakumar, K. S. (2020). Women as caregivers in the elderly. In P.S. Chandra, H. Herrman, J. Fisher & A. Riecher-Rössler (Eds.), *Mental Health and Illness of Women* (pp. 3-18). New York: Springer.
- Barbezat, S. (2020). Mexico's weather: What to expect. *TripSavvy*. Retrieved at <https://www.tripsavvy.com/mexico-weather-what-to-expect-1589004>
- Barrett, D. (2001). *Trauma and Dreams*. London: Harvard University Press.
- Barrett, D. (2020). Dreams about COVID-19 versus normative dreams: Trends by gender. *Dreaming*, 30, 216-221. doi:10.1037/drm0000149
- Benke, C., Autenrieth, L. K., Asselmann, E., & Pané-Farré, C. A. (2020). Lockdown, quarantine measures, and social distancing: Associations with depression, anxiety and distress at the beginning of the COVID-19 pandemic among adults from Germany. *Psychiatry Research*, 293, 113462. doi:10.1016/j.psychres.2020.113462
- Browne, C. (2021). Hundreds of anti-lockdown, anti-mask protesters take to the streets again in downtown Barrie. *Toronto Star*. <https://www.thestar.com/news/canada/2021/05/01/hundreds-of-anti-lockdown-anti-mask-protesters-take-to-the-streets-again-in-downtown-barrie.html>
- Casagrande, M., Favieri, F., Tambelli, R., & Forte, G. (2020). The enemy who sealed the world: effects quarantine due to the COVID-19 on sleep quality, anxiety, and psychological distress in the Italian population. *Sleep Medicine*, 75, 12-20. doi:10.1016/j.sleep.2020.05.011
- Chen, F., Zheng, D., Liu, J., Gong, Y., Guan, Z., & Lou, D. (2020). Depression and anxiety among adolescents during COVID-19: a cross-sectional study. *Brain, Behavior, and Immunity*, 88, 36-38. doi:10.1016/j.bbi.2020.05.061
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. New York: Routledge.

- Coiro, M. J., Asraf, K., Tzischinsky, O., Hadar-Shoval, D., Tannous-Haddad, L., & Wolfson, A.R. (2021). Sleep quality and COVID-19-related stress in relation to mental health symptoms among Israeli and U.S. adults. *Sleep Health*, 7, 127-133. doi:10.1016/j.sleh.2021.02.006
- Conte, F., Rescott, M. L., De Rosa, O., Cellini, N., Coppola, A., Cerasuolo, M., ... Ficca, G. (2021). Changes in dream features across the first and second waves of the Covid-19 pandemic. *Journal of Sleep Research*, First Online June 22. doi:10.1111/jsr.13425
- Cucinotta, D., & Vanelli, M. (2020). WHO declares COVID-19 a pandemic. *Acta bio-medica : Atenei Parmensis*, 91, 157-160. doi:10.23750/abm.v91i1.9397
- Davidson, J., & Lynch, S. (2012). Thematic, literal, and associative dream imagery following a high-impact event. *Dreaming*, 22, 58-69. doi:10.1037/a0026273
- DeCicco, T. (2007). Dreams of Female University Students: Content Analysis and the Relationship to Discovery via the Ullman Method. *Dreaming*, 17(2), 98-112. https://doi.org/10.1037/1053-0797.17.2.98
- DeCicco, T. L., Zanasi, M., Dale, A. L., Murkar, A., Longo, G., & Testoni, F. (2013). A cultural comparison of dream content, mood, and waking day anxiety between Italians and Canadians. *International Journal of Dream Research*, 6, 8-12. doi:10.11588/ijodr.2013.1.9330
- Dillon, E. C., Stults, C. D., Deng, S., Martinez, M., Szwedinski, N., Koenig, P. T., ... & Pertsch, S. (2022). Women, younger clinicians', and caregivers' experiences of burnout and well-being during COVID-19 in a US healthcare system. *Journal of general internal medicine*, 37(1), 145-153. https://doi.org/10.1007/s11606-021-07134-4
- Domhoff, G. (2001). Using content analysis to study dreams. In K. Bulkeley (Ed.), *Dreams: A reader on religious, cultural, and psychological dimensions of dreaming* (pp. 307-319). New York, NY: Palgrave Macmillan.
- Domhoff, G. W. (1996). *Finding Meanings in Dreams. A Quantitative Approach*. New York, NJ: Springer.
- Dudevich, A. & Frood, J. (2021). Impact of the COVID-19 pandemic on health system use in Canada. *Healthcare Quarterly*, 24(2), 12-14. doi:10.12927/hcq.2021.26552
- Elce, V., Handjaras, G., & Bernardi, G. (2021). The language of dreams: Application of linguistics based approaches for the automated analysis of dream experiences. *Clocks & Sleep*, 3(3), 495-514. https://doi.org/10.3390/clocksleep3030035
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5, 1-4. doi:10.11648/j.ajtas.20160501.11
- Farris, F.A. (2010). The Gini Index and Measures of Inequality. *The American Mathematical Monthly*, 117, 851-864. doi:10.4169/000298910X523344
- Forte, A., Orri, M., Brandizzi, M., Iannaco, C., Venturini, P., Liberato, D., ... Monducci, E. (2021). "My Life during the Lockdown": Emotional Experiences of European Adolescents during the COVID-19 Crisis. *International Journal of Environmental Research and Public Health*, 18, 7638. doi:10.3390/ijerph18147638
- Fosshage, J. (1983). The psychological function of dreams. A revised psychoanalytic perspective. *Psychoanalysis & Contemporary Thought*, 6, 641-669.
- Freud, S. (1900). The interpretation of dreams. In J. Strachey (Ed. and Trans.), *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (Vols. 4 and 5). London, UK: Hogarth Press.
- Freud, S. (1915-17). Introductory lessons on psycho-analysis. In J. Strachey (Ed. and Trans.), *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (Vol. 15). London, UK: Hogarth Press.
- Galima S.V., Vogel, S.L., & Kowalski, A.W. (2020). Seasonal affective disorder: Common questions and answers. *American Family Physician*, 102(11), 668-672.
- García-Fernández, L., Romero-Ferreiro, V., Padilla, S., López-Roldán, P.D., Monzó-García, M., & Rodríguez-Jimenez, R. (2020). Gender differences in emotional response to the COVID-19 outbreak in Spain. *Brain and Behavior*, 11, e01934. doi:10.1002/brb3.1934
- Généreux, M., Schluter, P.J., Hung, K.K., Wong, C.S., Pui Yin Mok, C., O'sullivan, T., ... Roy, M. (2020). One virus, four continents, eight countries: An interdisciplinary and international study on the psychosocial impacts of the COVID-19 pandemic among adults. *International Journal of Environmental Research and Public Health*, 17, 8390. doi:10.3390/ijerph17228390
- Giallonardo, V., Sampogna, G., Del Vecchio, V., Luciano, M., Albert, U., Carmassi, C., ... Fiorillo, A. (2020). The Impact of Quarantine and Physical Distancing Following COVID-19 on Mental Health: Study Protocol of a Multicentric Italian Population Trial. *Frontiers in Psychiatry*, 11, 533. doi:10.3389/fpsy.2020.00533
- Gorgoni, M., Scarpelli, S., Alfonsi, V., Annarumma, L., Cordone, S., Stravolo, S., & De Gennaro, L. (2021). Pandemic Dreams: quantitative and qualitative features of the oneiric activity during the lockdown due to COVID-19 in Italy. *Sleep Medicine*, 81, 20-32. February. doi:10.1016/j.sleep.2021.02.006
- Guerrero-Gomez, A., Nöthen-Garunja, I., Schredl, M., Homberg, A., Vulcan, M., Brusi, A., ... Iannaco, C. (2021). Dreaming in Adolescents During the COVID-19 Health Crisis: Survey Among a Sample of European School Students. *Frontiers in Psychology*, 12, 652627. doi:10.3389/fpsyg.2021.652627
- Hall, C. S., & Van de Castle, R. L. (1966). *The content analysis of dreams*. New York, NY: Appleton-Century-Crofts.
- Hartmann, E., & Basile, R. (2003). Dream imagery becomes more intense after 9/11/01. *Dreaming*, 13, 61-66. doi:10.1023/A:1023398924124
- Hewson, C., Vogel, C., & Laurent, D. (Eds.) (2016). *Internet Research Methods* (2nd ed.). London: Sage.
- Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 epidemic in China: a web-based cross-sectional survey. *Psychiatry Research*, 288, 112954. doi:10.1101/2020.02.19.20025395
- Iorio, I., Sommantico, M., & Parrello, S. (2020). Dreaming in the time of COVID-19: A qualitative Italian study. *Dreaming*, 30, 199-215. doi:10.1037/drm0000142
- Janson, D. J., Clift, B. C., & Dhokia, V. (2021). PPE fit of healthcare workers during the COVID-19 pandemic. *Applied Ergonomics*, 99, 103610. doi:10.1016/j.apergo.2021.103610
- Jones, E. & DeCicco, T.L. (2009). Differentiating anxiety and depression using The Storytelling Method of Dream Interpretation and Content Analysis. Paper presentation at the 26th Annual Conference of the International Association for The Study of Dreams, Chicago, Ill.
- King, D., & DeCicco, T. (2007). The relationships between dream content and physical health, mood, and self-construal. *Dreaming*, 17, 127-139. doi:10.1037/1053-0797.17.3.127
- IBM Corp. (2015). *IBM SPSS Statistics for Windows, Version 23.0*. Armonk, NY: IBM Corp.
- Kellner, R. (1987). *Abridged Manual of the Illness Attitude Scales* (mimeographed). Albuquerque: Department of Psychiatry, University of New Mexico.

- Levinson-King, R. (2021). Toronto lockdown - one of the world's longest? BBC News. <https://www.bbc.com/news/world-us-canada-57079577>
- Lima, C.K., De Medeiros Carvalho, P.M., Lima, I.D., De Oliveira Nunes, J.V., Saraiva, J.S., De Souza, R.I., ... Neto, L.M.R. (2020). The emotional impact of Coronavirus 2019-nCoV (new Coronavirus disease). *Psychiatry Research*, 287, 112915. doi:10.1016/j.psychres.2020.112915
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales*. 2nd ed. Sydney: Psychology Foundation.
- Loewen, P. (2021). Report 6: Three areas in which pandemic management could have been better. Public Policy Forum. <https://ppforum.ca/publications/three-areas-in-which-pandemic-management-could-have-been-better/>
- Margherita, G., Gargiulo, A., Lemmo, D., Fante, C., Filosa, M., Manari, T., ... Musetti, A. (2021). Are we dreaming or are we awake? A quali-quantitative analysis of dream narratives and dreaming process during the COVID-19 pandemic. *Dreaming*, 31, 373-387. doi:10.1037/drm0000180
- Mariani, R., Gennaro, A., Monaco, S., Di Trani, N., & Salvatore, S. (2021). Narratives of Dreams and Waking Thoughts: Emotional Processing in Relation to the COVID-19 Pandemic. *Frontiers in Psychology*, 12, 745081. doi:10.3389/fpsyg.2021.745081
- Mariani, R., Monaco, S., Christian, C., & Di Trani, M. (2021). Dreaming in quarantine: linguistic analysis of referential process of dreams during COVID-19 pandemic lockdown. *Research in Psychotherapy: Psychopathology, Process and Outcome*, 24, 176-187. doi:10.4081/ripppo.2021.537
- McKay, C., & DeCicco, T.L. (2020). Pandemic Dreaming: The Effect of COVID-19 on Dream Imagery, a Pilot Study. *Dreaming*, 30, 222-234. doi:10.1037/drm0000148
- Miller, N.J., DeCicco, T.L., Dale, A.L., & Murkar, A. (2015). Assessing the effects of meditation on dream imagery, depression, and anxiety. *International Journal of Dream Research*, 8, 99-104. doi:10.11588/ijodr.2015.2.18702
- Necho, M., Tsehay, M., Birkie, M., Biset, G., & Tadesse, E. (2021). Prevalence of anxiety, depression, and psychological distress among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *International Journal of Social Psychiatry*, 67, 892-906. doi:10.1177/00207640211003121
- Nielsen, T.A., Zadra, A.L., Simard, V., Saucier, S., Strenstrom, P., Smith, C., & Kuiken, D. (2003). The typical dreams of Canadian university students. *Dreaming*, 13, 211-235. doi:10.1023/B:DREM.0000003144.40929.0b
- Nunnally, J., & Bernstein, I. H. (1995). *Psychometric theory*. New York: McGraw-Hill.
- Osorio-Guzmán, M. y Prado-Romero, C. (2021). Efectos económicos, escolares y de salud del COVID-19 en una muestra de estudiantes universitarios mexicanos. *Enseñanza e Investigación en Psicología*, 3, 90-100.
- Padrón, I., Fraga, I., Vieitez, L., Montes, C., & Romero, E. (2021). A Study on the Psychological Wound of COVID-19 in University Students. *Frontiers in Psychology*, 12, 589927. doi:10.3389/fpsyg.2021.589927
- Paperny, A.M. & Lampert, A. (2022). Canadian hospitals strain as Omicron hits health workers. Reuters. <https://www.reuters.com/world/americas/canadian-hospitals-strain-omicron-hits-health-workers-2022-01-24/>
- Parrello, S., Sommantico, M., Lacatena, M., & Iorio, I. (2021). Adolescents' dreams under Covid-19 isolation. *International Journal of Dream Research*, 14, 10-20. doi:10.11588/ijodr.2021.1.73858
- Passifiume, B. (2022). Misery index ranks Canada's pandemic pain: 'We've suffered a lot of non-COVID damage. National Post. <https://nationalpost.com/news/canada/misery-index-ranks-canadas-pandemic-pain-weve-suffered-a-lot-of-non-covid-damage>
- Pesant, N., & Zadra, A. (2006). Dream content and psychological well-being: A longitudinal study of the continuity hypothesis. *Journal of Clinical Psychology*, 62, 111-121. doi:10.1002/jclp.20212
- Pesonen, A., Lipsanen, J., Halonen, R., Elovainio, M., Sandman, N., Mäkelä, J., ... Kuula, L. (2020). Pandemic Dreams: Network Analysis of Dream Content During the COVID-19 Lockdown. *Frontiers in Psychology*, 11, 573961. doi:10.3389/fpsyg.2020.573961
- Piumatti, G., Levati, S., Amati, R., Crivelli, L., & Albanese, E. (2022). Trajectories of depression, anxiety, and stress among adults during the COVID-19 pandemic in Southern Switzerland: The Corona Immunitas cohort study. *Public Health, First Online February 2*. doi: 10.1016/j.puhe.2022.02.005
- Rivers, M. & Gallón, N. (2021, February 16). 'It's not fair': Mexico will file complaint at UN over unequal vaccine distribution. CTV News. <https://www.ctvnews.ca/health/coronavirus/it-s-not-fair-mexico-will-file-complaint-at-un-over-unequal-vaccine-distribution-1.5311300>
- Rosen, J., Reynolds, C.F., Yeager, A.L., Houck, P.R., & Hurwitz, L.F. (1991). Sleep disturbances in survivors of the Nazi Holocaust. *American Journal of Psychiatry*, 148, 62-66. doi:10.1176/ajp.148.1.62
- Rossi, R., Socci, V., Talevi, D., Mensi, S., Niolu, C., Pacitti, F. ... Di Lorenzo, G. (2020). COVID-19 Pandemic and Lockdown Measures Impact on Mental Health Among the General Population in Italy. *Frontiers in Psychiatry*, 11, 790. doi:10.3389/fpsyg.2020.00790
- Salari, N., Hosseini-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., & Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Globalization and Health*, 16, 1-11. doi: 10.1186/s12992-020-00589-w.
- Saravanan, C., Mahmoud, I., Elshami, W., & Taha, M.H. (2020). Knowledge, Anxiety, Fear, and Psychological Distress About COVID-19 Among University Students in the United Arab Emirates. *Frontiers in Psychiatry*, 11, 582189. doi:10.3389/fpsyg.2020.582189
- Scarpelli, S., Alfonsi, V., Mangiaruga, A., Musetti, A., Quattropani, M. C., Lenzo, V. ... Franceschini, C. (2021a). Pandemic nightmares: Effects on dream activity of the COVID-19 lockdown in Italy. *Journal of Sleep Research*, First Online 6 February. doi:10.1111/jsr.13300
- Scarpelli, S., Gorgoni, M., Alfonsi, V., Annarumma, L., Di Natale, V., Pezza, E., & De Gennaro, L. (2021b). The impact of the end of COVID confinement on pandemic dreams, as assessed by a weekly sleep diary: a longitudinal investigation in Italy. *Journal of Sleep Research*, First Online 20 July. doi:10.1111/jsr.13429
- Scarpelli, S., Alfonsi, V., Gorgoni, M., Musetti, A., Filosa, M., Quattropani, M.C., ... Franceschini, C. (2021c). Dreams and Nightmares during the First and Second Wave of the COVID-19 Infection: A Longitudinal Study. *Brain Sciences*, 11, 1375. doi:10.3390/brainsci11111375
- Schneider, A., & Domhoff, G. (2019). The quantitative study of dreams. Retrieved from <http://dreamresearch.net>
- Schredl, M. (2006). War-related dream themes in Germany from 1956 to 2000. *Political Psychology*, 27, 299-307. doi:10.1111/j.1467-9221.2006.00008.x

- Schredl, M., Berres, S., Klingauf, A., Schellhaas, S., & Göritz, A.S. (2014). The Mannheim Dream Questionnaire (MADRE): Retest reliability, age and gender effects. *International Journal of Dream Research*, 7, 141–147. doi:10.11588/ijodr.2014.2.16675
- Schredl, M. & Bulkeley, K. (2020). Dreaming and the COVID-19 pandemic: A survey in a U.S. sample. *Dreaming*, 30, 189–198. doi:10.1037/drm0000146
- Schredl, M., Adam, K., Beckmann, B., & Petrova, I. (2016). Health dreams, health-related worries, and being ill: A questionnaire study. *International Journal of Dream Research*, 9, 82–85. doi:10.11588/ijodr.2016.1.27638
- Schredl, M., & Reinhard, I. (2011). Gender differences in nightmare frequency: A meta-analysis. *Sleep Medicine Reviews*, 15, 115–121. doi:10.1016/j.smrv.2010.06.002
- Serpe, A., & DeCicco, T. L. (2020). An investigation into anxiety and depression in dream imagery: The issue of comorbidity. *International Journal of Dream Research*, 13, 82–89. doi:10.11588/ijodr.2020.1.68130
- Settineri, S., Frisone, F., Alibrandi, A., & Merlo, E.M. (2019). Italian adaptation of the Mannheim Dream Questionnaire (MADRE): Age, gender and dream recall effects. *International Journal of Dream Research*, 12, 119–129. doi:10.11588/ijodr.2019.1.59328
- Shala, M., Çollaku Jetishi, P., Hoxha, A., Balaj Bllaca, S., & Preteni, D. (2021). One Year after the First Cases of COVID-19: Factors Influencing Anxiety among Kosovar University Students. *Journal of Health and Social Sciences*, 6, 241–254. doi:10.19204/2021/nyrf10
- Sommantico, M. (2010). La Ciénaga. Ou le malaise dans la famille comme révélateur du Malaise dans la culture. *Cahiers de Psychologie Clinique*, 34, 205–217. doi:10.3917/cpc.034.0203
- Sommantico, M. (2016). A couple's unconscious communication: dreams. *British Journal of Psychotherapy*, 32, 456–474. doi:10.1111/bjp.12251
- Sommantico, M. (2018). La fonction transformatrice du rêve [The transformative function of the dream]. *Revue française de psychanalyse*, 82, 1475–1480. doi:10.3917/rfp.825.1475
- Sommantico, M., Donizzetti, A.R., De Rosa B., Parrello S., & Osorio Guzmán M. (2015). L'invarianza per età nella validazione italiana dell'Aggression Questionnaire (AQ) di Buss e Perry. *Psicologia della salute*, 3, 111–125. doi:10.3280/PDS2015-003006
- Sommantico, M., Iorio, I., Lacatena, M., & Parrello, S. (2021a). Dreaming during COVID-19 lockdown: A comparison between Italian adolescents and adults. *Research in Psychotherapy: Psychopathology, Process and Outcome*, 24, 212–223. doi:10.4081/ripppo.2021.536
- Sommantico, M., Iorio, I., Parrello, S. (2021b). Mood, sleep quality, and dreaming during the third wave of the COVID-19 pandemic in Italy. *International Journal of Dream Research*, 14, 309–319. doi:10.11588/ijodr.2021.2.82109
- Statista. (2022). Percentage of Canadian population partially or fully vaccinated against COVID-19 as of February 13, 2022, by province. Accessed March 7, 2022 from <https://www.statista.com/statistics/1228184/canadian-population-share-received-covid-vaccination-province/>
- The World Bank (2020). Poverty and Shared Prosperity 2020. Accessed March 3, 2022 from <https://openknowledge.worldbank.org/bitstream/handle/10986/34496/9781464816024.pdf>.
- Usher, K., Durkin, J., & Bhullar, N. (2020). The COVID-19 pandemic and mental health impacts. *International Journal of Mental Health Nursing*, 29, 315–18. doi:10.1111/inm.12726
- Velotti, P., & Zavattini, G. C. (2019). È ancora attuale l'uso del sogno nella pratica clinica? [Is the use of dream still actual in clinical practice?]. *Giornale Italiano di Psicologia*, 3, 433–462. doi:10.1421/94505
- Wang, Z.H., Yang, H.L., Yang, Y.Q., Liu, D., Li, Zh-H., & Zhang, X-R. ... Mao, C. (2020). Prevalence of anxiety and depression symptom, and the demands for psychological knowledge and interventions in college students during COVID-19 epidemic: A large cross-sectional study. *Journal of Affective Disorders*, 275, 188–193. doi:10.1016/j.jad.2020.06.034
- World Health Organization (2020). Mental Health and Psychosocial Considerations During COVID-19 Outbreak
- Worldometer. (n.d.). COVID-19 coronavirus pandemic. Accessed November 18, 2021 from <https://www.worldometers.info/coronavirus/>
- World Population Review. (n.d). Gini Coefficient by Country 2021. Accessed March 3, 2022 from <https://www.investopedia.com/terms/g/gini-index.asp#citation-10>
- Zurlo, M. C., Cattaneo della Volta, M. F., & Vallone, F. (2020). COVID-19 Student Stress Questionnaire: Development and Validation of a Questionnaire to Evaluate Students' Stressors Related to the Coronavirus Pandemic Lockdown. *Frontiers in Psychology*, 11, 576758. doi:10.3389/fpsyg.2020.576758