Dreaming During the COVID-19 Pandemic: A Systematic Research Literature Review

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Abstract

The aim of this study is to review the available findings on dreaming during the COVID-19 pandemic. To that end, we explored the PsycINFO, Cochrane, EBSCOhost, EMBASE, Google Scholar, PubMed, Pro-Quest Medical, ScienceDirect, Scopus, and Web of Science electronic databases, as well as the medRxiv.org, psyarxiv.com, and arXiv.org preprints servers. We input the search terms 'dream(s)', 'dreaming', 'nightmare(s)', as associated with the additional terms 'COVID-19', '2019-nCoV', '2019 coronavirus', 'Wuhan coronavirus', '2019 novel coronavirus', 'SARS-CoV-2', and/or 'pandemic'. Thirty-nine papers (from a total pool of 57,802 participants from over eighty-six countries) were thus included in this systematic research literature review on dreaming during the COVID-19 pandemic. Results showed the following: women remember dreams and nightmares with more thick description, and they report the longest and most emotionally negative dreams; younger subjects, such as adolescents and young adults, have the dreams most affected by the pandemic; and, finally, the dreams of participants who came into direct contact with COVID-19 are characterized by a higher emotional intensity. We also describe the most frequent qualitative and quantitative characteristics of dreams and nightmares. Taken together, the results of this systematic research literature review highlight the influence of the COVID-19 pandemic on dreaming, by showing how this traumatic event has been reflected in dream life.

Keywords: Dreaming; COVID-19; Review; Continuity Hypothesis; Psychoanalysis.

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Introduction

Different theoretical perspectives including, among others, the psychoanalytic framework (Freud, 1900) and the Continuity Hypothesis (Schredl, 2006), have analyzed the experience of dreaming by demonstrating that the dream performs an integrative, transformative, and elaborative function.

Indeed, starting from the seminal psychoanalytic work of Sigmund Freud (1900), which is based on an interpretative approach for decoding unconscious meanings in dreams' manifest content, the dream has been understood both as a hallucinatory form of wish-fulfillment and also as a way to retroactively master and transform waking life traumatic events (Adams-Silvan & Silvan, 1990; Fosshage, 1983; Freud, 1915-17; Sommantico, 2018). In particular, the dream can serve a traumatolytic function for the mind (Ferenczi, 1932) by integrating traumatic waking life events in need of resolution and by serving as a type of mental activity focused on the elaboration of emotional experiences (Ferro, 2002; Bion, 1962; Grotstein, 2000).

Alternatively, manifest-content analysis usually emphasizes the continuity between dreams and daily experiences, thereby providing evidence for what has been called the Continuity Hypothesis. This hypothesis states that waking life is continuous with and therefore reflected in dreams, as well as the reverse: that dreams continue into waking life (Domhoff, 1996; Schredl, 2006). From this theoretical perspective, dreaming plays a significant role in processing and/or integrating waking-life experiences, especially those which are personally significant and characterized by high emotional intensity and stress, or those related to specific concerns (Barrett, 1996; Malinowski & Horton, 2014; Roussy et al., 1996; Schredl, 2006).

Furthermore, findings in the literature of dream studies on catastrophic and/or traumatic events as well as waking concerns or threats (Bradshaw et al., 2016; Davidson & Lynch, 2012; Hartmann, 2011), from both psychoanalytic and Continuity Hypothesis perspectives (Barrett, 1996; Hartmann & Basile, 2003; Schredl & Piel, 2006), show that these types of events have a strong impact on dreams due to their emotional salience. In turn, they influence dream content; for those individuals coping with traumatic experiences, dreams restore psychic symbolic function, by also transforming the experience of passivity (Adams-Silvan & Silvan, 1990; Pöstenyi, 1996; Varvin et al., 2013).

Similarly, initial findings in the dream studies literature regarding populations subject to the emergency measures related to the COVID-19 pandemic show that these events have had a strong impact on dreams due to their emotional salience, which thereby influences dream content (Barrett, 2020; Iorio et al., 2020; Pesonen et al., 2020; Schredl & Bulkeley, 2020). This has been found to ring true throughout the different waves of the pandemic. Indeed, as the pandemic progresses, dreams have become more emotionally intense, with more distressing and negative tones in dreams, as well as an increased frequency of nightmares and nightmare distress (Scarpelli et al., 2021c; Sommantico, Iorio, & Parrello, 2021). Additionally, dreams tend be less distressing in between the waves of the pandemic, when people are not experiencing lockdown (Conte et al., 2021). Participants with more direct experience of COVID-19 reported higher emotional intensity in their dreams, as characterized by a higher presence

of sensory impressions (Barrett, 2020; Iorio et al., 2020; Parrello et al., 2021; Schredl & Bulkeley, 2020; Sommantico, Iorio, Lacatena et al., 2021). Furthermore, during the pandemic, dream imagery has been characterized by a high presence of virus-related themes, particularly by anxieties and concerns related to the COVID-19 contagion (MacKay & DeCicco, 2020; Pesonen et al., 2020; Sommantico, Iorio, Lacatena et al., 2021).

To our knowledge, no systematic review has yet been conducted to examine the impact of the pandemic on dreaming during the COVID-19 pandemic. To address this knowledge gap, using the previously cited literature as a foundation, the aim of the present study is to conduct a comprehensive literature review by analyzing the research available on dreaming in the time of COVID-19 in electronic databases, scholarly search engines, and preprints servers.

Method

Search Strategy

We conducted a scoping review of all available literature on dreaming and COVID-19, followed by a systematic review of original research in compliance with the recommendations and criteria described in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist (Liberati et al., 2009).

Database Search

We conducted an electronic search of ten electronic databases and one scholarly search engine from November 1, 2019 to April 20, 2022: PsycINFO, Cochrane, EB-SCOhost, EMBASE, Google Scholar, PubMed, Pro-Quest Medical, ScienceDirect, Scopus, and Web of Science. In addition, three preprints servers (medRxiv.org, psyarxiv.com, and arXiv.org) were also searched for peer reviewed articles and papers that had been accepted but not yet published. There were no language restrictions. The search strategy involved the crosschecking of keywords which were selected based on the Medical Subjects Headings and Boolean logic operators. The following keywords were used in an [All Fields] search: 'dream' OR 'dreams' OR 'dreaming' OR 'nightmare' OR 'nightmares', AND 'COVID-19' OR '2019-nCoV' OR '2019 coronavirus' OR 'Wuhan coronavirus' OR '2019 novel coronavirus' OR 'SARS-CoV-2' OR 'pandemic'.

Reference lists of the identified studies were searched to find relevant articles and to ensure that all related publications were included in the analysis. The full-text versions of the literature were screened and analyzed for methodologic quality. The processes were performed independently, and disagreements between reviewers were resolved by discussion and consensus with a third colleague not involved in the research.

Selection Criteria

We screened all observational studies that analyzed the effects of the COVID-19 pandemic on dreaming in clinical populations and healthcare workers, as well as general populations. Specific inclusion criteria for selection were the following: (a) publication date between November 1, 2019 and April 20, 2022; (b) original research articles published in English, Spanish, German, Portuguese, French, Italian, or Arabic; and (c) studies that reported qualitative (e.g., dream narratives,

Figure 1. Record Selection
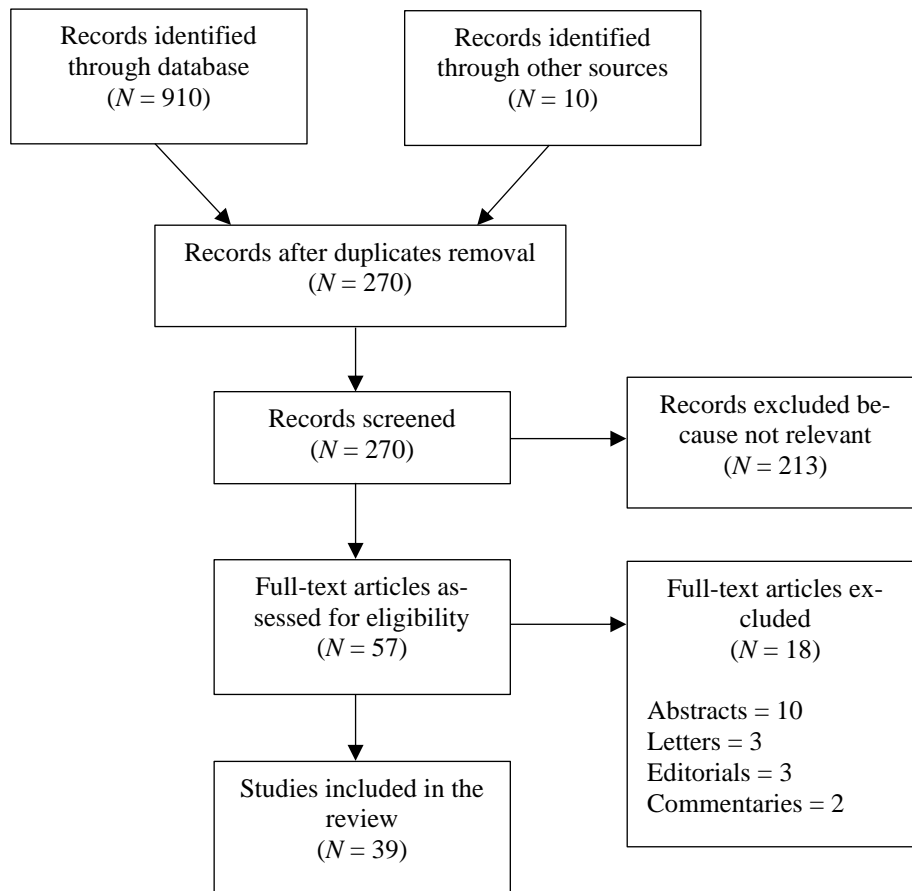
emotional tone, vividness) or quantitative data (e.g., recall frequency, length, increase) for dreams and nightmares. Specific exclusion criteria were: (a) abstracts; (b) letters; (c) editorials; and (d) commentaries (see Figure 1).

Coding

The following variables were extracted from the studies: first (or single) author, publication year, country, general theme, population [total sample size, mean age of the total sample (when possible; otherwise, the age range)], group (e.g. adult population vs. adolescent population, general population vs. clinical population), research design (e.g. observational/cross-sectional vs. longitudinal, convenience sampling vs. population-based sampling, control groups vs. non control groups), and measurement methods and analysis strategy (e.g. questionnaire, scale, etc. vs. dream narrative, quantitative vs. qualitative, or quali-quantitative) (see Table 1).

Table 1. Selected Full-Text Articles Included in the Review

SN	First author(s)	Year	Country	Theme	Population	Research design	Measures* and analysis
1	Alghamdi	2022	Saudi Arabia	Nightmares patterns and predictors during COVID-19 pandemic	368 participants (64.1% women; mean age 20.4 ± 1.6 years)	Cross-sectional, convenience sampling	Nightmare quantitative indicators
2	Barrett	2020	86 countries (USA, UK, Italy, Canada, Spain, India, Peru, Germany, Mexico, Australia, Brazil, France, Poland, and 73 other non-specified)	Comparison between pandemic dreams and normative dreams	2888 participants (69.2% women; mean age 40.1 ± 16.9 years)	Cross-sectional, convenience sampling	Dream narratives analyzed through the LIWC
3	Borghi	2021	Italy	Dreams during the COVID-19 lockdown	761 participants (82.8% women; mean age 33 ± 12.4 years)	Cross-sectional, convenience sampling	Dream narratives qualitatively analyzed through the thematic content analysis
4	Cong	2022	China	Attitudes toward dreams and dreams content in the post-pandemic period	1242 participants (74.4% women; mean age 19.29 ± 1.4 years)	Cross-sectional, convenience sampling	DAS and 55TDQ
5	Conte	2021	Italy	Changes in dream features across the first two COVID-19 pandemic waves	At April 2020, 1622 participants (mean age 34.1 ± 13.6 years); at November 2020, 214 participants (mean age 36.78 ± 14.2 years)	Cross-sectional and longitudinal, convenience sampling	Dream frequency, length, and vividness; prevalent emotional valence of current and past dreams; occurrence of dream content related to the pandemic;
6	Fränkl	2021	Austria, Brazil, Canada, Hong Kong, China, Finland, France, Italy, Japan, Norway, Sweden, Poland, UK, and USA	Dreams, nightmares, and related social, health, and mental health factors during the COVID-19 pandemic	19355 participants (66.3% women; age range 18-65+)	Cross-sectional, convenience sampling	Dream recall frequency and nightmare frequency
7	Gallagher	2021	USA	Dreams during the COVID-19 pandemic	190 participants (74% women; mean age 19 ± 3.7 years)	Cross-sectional, convenience sampling	Dream narratives quantitatively analyzed
8	Giovanardi	2022	Italy	Dreams and nightmares during the COVID-19 lockdown	598 participants (86% women; mean age 30.9 ± 10.9 years)	Cross-sectional, convenience sampling	Dream and nightmare frequency, emotions, and vividness
9	Goncalves	2022	Portugal	Nightmares during the COVID-19 pandemic	5011 participants (73.4% women; age range 18-60+)	Longitudinal, convenience sampling	Nightmare profiles
10	Gorgoni	2021	Italy	Dreams during the COVID-19 lockdown	1091 participants (71.9% women; mean age 31.3 ± 0.33 years)	Cross-sectional, convenience sampling	Dream frequency, emotional load, vividness, bizarreness, and length
11	Gorgoni	2022	Italy	Dreams during and after the COVID-19 lockdown	108 participants (76.8% women; age range 18-40+)	Longitudinal, convenience sampling	Dream frequency, emotional load, vividness, bizarreness, and length, most frequent dream emotion, TDQ
12	Guerrero-Gomez	2021	Italy, Romania, and Croatia	Dreams and nightmares during the COVID-19 lockdown	2105 participants (69% women; mean age 15.4 ± 2.1 years)	Cross-sectional, convenience sampling	Dream narratives, dream recall frequency and increase, nightmare increase, and pandemic-related dream
13	Guo	2021	China	Media exposure to COVID-19 epidemic and threatening dreams	399 participants (65.5% women; mean age 28.7 ± 9.8 years)	Cross-sectional, convenience sampling	Threatening dream narratives and threatening dream frequency measured by the DTQ

14	Iorio	2020	Italy	Dreams during the COVID-19 loch-down	796 participants (73.2% women; mean age 30.3 ± 12.8 years)	Cross-sectional, convenience sampling	MADRE, MRD, intensity of the positive emotions, of the negative emotions, and realism/bizarreness, and presence of sensory impressions in the MRD
15	Kennedy	2022	USA	Nightmares during the COVID-19 pandemic	419 participants (74% women; mean age 45.9 ± 16.1 years)	Cross-sectional, convenience sampling	Nightmare themes and MADRE
16	Kilius	2021	Canada	Dreams during the COVID-19 lock-down	71 participants (71.8% women; age range 18-49)	Cross-sectional, convenience sampling	Dream narratives analyzed using the HVdC, dreams changes, use of dreams to make decisions in everyday lives, and presence of COVID-19 explicit dreams
17	Le Bel	2022	Canada	Dreams during the COVID-19 pandemic	109 participants (76.1% women; mean age 26.3 ± 11.7 years)	Cross-sectional, convenience sampling	MRD analyzed using the HVdC
18	MacKay	2020	Canada	Dreams during the COVID-19 pandemic	19 participants (68% women; age range 18-36+)	Cross-sectional, convenience sampling	Dream narratives analyzed using the HVdC
19	Mar-gherita	2021	Italy	Dream narratives and dreaming process during the COVID-19 pandemic	1095 participants (81% women; age range 18-60+)	Cross-sectional, convenience sampling	MADRE and dream narratives quali-quantitatively analyzed
20	Mariani, Gennaro	2021	Italy	Dreams and waking thoughts during the COVID-19 pandemic	49 participants (55.1% women; mean age 33.4 ± 10.1 years)	Cross-sectional, population-based sampling	Dream narratives studied utilizing the MCT and the ASI in lexical correspondence analysis
21	Mariani, Monaco	2021	Italy	Dreams during the COVID-19 lock-down	68 participants (67.6% women; mean age 26.2 ± 7.7 years)	Cross-sectional, convenience sampling	Dream narratives analyzed utilizing the MCT through IWRAD, IWRRL, ISenS, and IS-Aff
22	Marogna	2021	Italy	Dreams during the COVID-19 pandemic	17 participants (52.9% women; mean age 24.9 ± 3.4 years)	Cross-sectional, convenience sampling	Dream narratives, emotions and related free connections/associations analyzed through computer assisted qualitative analysis
23	Monaco	2022	Italy	Dreams during the COVID-19 lock-down	68 participants (68% women; 62% < 26 years)	Cross-sectional, convenience sampling	Dream narratives quali-quantitatively analyzed
24	Mota	2020	Brazil	Dreams before and during the COVID-19 lockdown	31 participants reporting pandemic dreams (83.9% women; mean age 34 ± 8.7 years) and 31 participants reporting control dreams (80.6% women; mean age 28.5 ± 9.1 years)	Cross-sectional, convenience sampling	Dream narratives analyzed though natural language processing (dream length, word connectedness, emotional, and semantic content)
25	Musse	2020	Brazil	Nightmares during the COVID-19 pandemic	1057 participants (78% women; mean age 38 ± 14 years)	Cross-sectional, convenience sampling	Nightmare narratives, frequency, and increase
26	Parrello	2021	Italy	Dreams during the COVID-19 lock-down	235 participants (73.2% women; mean age 16.1 ± 1.7 years)	Cross-sectional, convenience sampling	MADRE, MRD, intensity of the positive emotions, of the negative emotions, and realism/bizarreness, and

						presence of sensory impressions in the MRD
27	Pesonen	2020	Finland	Dream narratives during the lockdown	4275 participants (79% women; mean age 42.6 ± 13.7 years)	Cross-sectional, convenience sampling	Dream narratives, dream content frequencies and networks
28	Scarpelli, Alfonsi, Mangiaruga	2021	Italy	Dreams and nightmares during the COVID-19 lockdown	5988 participants (73.3% women; age range 18-60+)	Cross-sectional, convenience sampling	MADRE
29	Scarpelli, Gorgoni, Alfonsi	2021	Italy	Dreams at the end of the COVID-19 confinement	90 participants (80% women; mean age 25.8 ± 3.8 years)	Longitudinal, convenience sampling	Dream recall frequency, emotional intensity, visual vividness, bizarreness, and perceived length of dream contents
30	Scarpelli, Alfonsi, Gorgoni	2021	Italy	Dreams and nightmares during the first and second wave of the COVID-19 pandemic	611 participants (79.1% women; age range 18-60+)	Longitudinal, convenience sampling	MADRE
31	Scarpelli, Alfonsi, D'Anselmo	2021	Italy	Dreams and nightmares in narcoleptic patients during the COVID-19 lockdown	43 participants (58.1% women; age range 18-60)	Cross-sectional, convenience sampling, clinical population, case-matched control group	MADRE
32	Scarpelli	2022	Austria, Brazil, Canada, Hong Kong, China, Finland, France, Italy, Japan, Norway, Sweden, Poland, UK, and USA	Dreams and nightmares in people affected by the COVID-19	1088 participants (59.7 women; age range 18-65+)	Cross-sectional, convenience sampling, with matched control group	Dream recall frequency and nightmares frequency
33	Šćepanović	2022	86 countries (USA, UK, Italy, Canada, Spain, India, Peru, Germany, Mexico, Australia, Brazil, France, Poland, and 73 other non-specified)	Dreams about health during the COVID-19 pandemic	2888 participants (69.2% women; mean age 40 ± 16.9 years)	Cross-sectional, convenience sampling	Dream narratives analyzed through MedDL, medical condition frequency, and co-occurrence network of dream conditions
34	Schredl	2020	USA	Dreams during the COVID-19 pandemic	3031 participants (55.4% women; mean age 49.5 ± 17.7 years)	Cross-sectional, convenience sampling	Dream narratives, dream recall frequency, and dream emotional tone
35	Solomonova	2021	Canada	Dreams, bad dreams, and nightmares before and during the COVID-19 pandemic	968 participants (73.3% women; mean age 52.5 ± 17.2 years)	Cross-sectional, convenience sampling	TDQ and dream, bad dream, and nightmare recall frequency
36	Sommantico, Iorio, Parrello	2021	Italy	Dreams during the third wave of the COVID-19 pandemic	329 participants (76% women; mean age 37.2 ± 16 years)	Cross-sectional, convenience sampling	MADRE, MRD, intensity of the positive emotions, of the negative emotions, and realism/bizarreness, and presence of sensory impressions in the MRD
37	Sommantico, Iorio, Lacatena	2021	Italy	Adults' and adolescents' dreams during the COVID-19 lockdown	475 participants (73.9% women; mean age 25.10 ± 12.2 years)	Cross-sectional, convenience sampling	Dream recall frequency, dream emotional intensity and overall emotional tone, MRD, intensity of the positive emotions, of the negative emotions, and realism/bizarreness, and presence of sensory impressions in the MRD

| 38 | Somman-tico | 2022 | Italy, Mexico, and Canada | Dreams during the second wave of the COVID-19 pandemic | 620 participants (79.9% women; mean age 27 ± 11.5 years) | Cross-sectional, convenience sampling | MRD analyzed using the HVdC |
| 39 | Wang | 2021 | China | Threatening events in dreams during the COVID-19 pandemic | 127 participants reporting pandemic dreams (79.1% women; mean age 25.6 ± 3.9 years) and 140 participants reporting control dreams (80.2% women; mean age 22.9 ± 3.1 years) | Cross-sectional, convenience sampling | MRD analyzed using the SCS |

Note: *We only reported measures related to dreams and nightmares; LIWC = Linguistic Inquiry and Word Count (Pennebaker et al., 2015); DAS = Dream Attitude Scale (Hill et al., 1997); 55TDQ = Chinese version of the Typical Dream Questionnaire (Chen et al., 2010); DTQ = Dream Threat Questionnaire (DTQ), a Chinese self-rating scale developed from the Dream Threat Scale (DTS; Revonuso & Valli, 2008); MA-DRE = Mannheim Dream Questionnaire (Schredl et al., 2014); MRD = Most Recent Dream (Hall & Van de Castle, 1966; Domhoff, 2003; Malinowski, 2015); HVdC = Hall-Van de Castle Dream Coding System (Hall & Van de Castle, 1966); MCT = Multiple Code Theory (Bucci, 2021); ASI = Affective Salience Index (Gennaro et al., 2020); IWRAD = Italian Weighted Referential Activity Dictionary (Mariani et al., 2013); IWRRL = Italian Weighted Reflection and Reorganization List (Negri et al., 2018); ISenS = Italian Sensory Somatic Dictionary (Di Trani et al., 2018); ISAff = Italian Sum Affect Dictionary; MedDL = Medical Deep Lerning (Šćepanović et al., 2020); TDQ = Typical Dreams Questionnaire (Nielsen et al., 2003); SCS = Social Content Scale (Tuominen et al., 2019).

Results

Characteristics of Selected Literature

A total of 920 records were identified through database searches and other sources. When duplicates were removed, 270 records remained. A total of fifty-seven potential papers were full-text screened. Of these, eighteen papers were excluded (including abstracts, letters, editorials, and commentaries).

Two major themes were identified in the excluded literature: (a) sleep medicine and disorders; and (b) dream-related phenomena such as daydreaming or waking thoughts.

Thirty-nine papers (see Table 1), involving a total of 57,802 participants from more than 86 countries were judged relevant and contributed to the systematic review of dreaming during the COVID-19 pandemic (although some papers do not report all the involved countries, and there was no record of any from African nations). The median number of participants per study was 598.

All the papers were published in peer-reviewed journals and were published after September 2020. Only five studies (12.8%; Conte et al., 2021; Goncalves et al., 2022; Gorgoni et al., 2022; Scarpelli et al., 2021b; Scarpelli et al., 2021c) were longitudinal, while the majority used observational/cross-sectional research design. These studies collected data in the first half of 2020, which was characterized almost everywhere by strict domestic confinement. Only four studies collected data in the first half of 2021 (10.26%; Cong et al., 2022; Scarpelli et al., 2021c; Sommantico, Iorio, Lacatena et al., 2021; Sommantico et al., 2022). Only six studies made comparisons between populations in different countries (15.4%; Barrett, 2020; Fränkl et al., 2021; Guerrero-Gomez et al., 2021; Scarpelli et al., 2022; Šćepanović et al., 2022; Sommantico et al., 2022). Only two studies utilized control groups (5.1%; Scarpelli et al., 2021d; Scarpelli et al., 2022). Only one study was conducted on a clinical population (2.6%; Scarpelli et al., 2021d), and only one study focused on participants infected with COVID-19 (2.6%; Scarpelli et al., 2022). The majority of studies focused on the general population. Only three studies (7.7%; Guerrero-Gomez et

al., 2021; Parrello et al., 2021; Sommantico, Iorio, & Parrello, 2021) were conducted on the adolescent population, and only one study (2.6%; Cong et al., 2022) was conducted in the post-pandemic period. With respect to the latter point, in order to compare pre-pandemic and pandemic dreams, several studies called for retrospective self-assessments, and only a few had access to specific data that had already been collected. True longitudinal studies could only be performed by analyzing and comparing data from the various waves of the pandemic (e.g., Cong et al., 2022; Conte et al., 2021; Goncalves et al., 2022; Gorgoni et al., 2022; Scarpelli et al., 2021b; Scarpelli et al., 2021c).

A range of research measures and instruments were used. Altogether, twenty-three (59%) of the studies used dream and nightmare narratives, analyzed though a qualitative/quantitative mixed methodology. Access to the dreamers' oneiric world was achieved through previously validated methodologies, as in seven studies (19.4%; Iorio et al., 2020; Le Bel & DeCicco, 2022; Parrello et al., 2021; Sommantico, Iorio, Lacatena et al., 2021; Sommantico, Iorio, & Parrello, 2021; Sommantico et al., 2022; Wang et al., 2021), some of which utilized the Most Recent Dream (Domhoff, 2003; Hall & Van de Castle,1966). Two studies (5.1%; Guo & Shen, 2021; MacKay & DeCicco, 2020) utilized a dream journal. The majority of the studies, however, used ad hoc instructions, asking participants to recount, and sometimes self-assess, dreams and/or nightmares from a specific period (pre-pandemic, total lockdown, partial lockdown) or with specific content, e.g., COVID-19-related.

Only twelve (30.86%) of the studies used well-established validated measures such as the Dream Attitude Scale (DAS; Hill et al.,

1997), the Chinese version of the Typical Dream Questionnaire (55TDQ; Chen et al., 2010), the Mannheim Dream Questionnaire (MADRE; Schredl et al., 2014), the Affective Salience Index (ASI; Gennaro et al., 2020), the Typical Dreams Questionnaire (TDQ; Nielsen et al., 2003), and/or the Social Content Scale (SCS; Tuominen et al., 2019) (see Table 1). Finally, only fifteen (38.5%) of the studies focused exclusively on dreaming, while fifteen (38.5%) of the studies also reported sleep quality measures, twenty (51.3%) also reported depression, anxiety, and stress measures, and eleven studies (28.2%) also reported different measures of well-being, including mental suffering (e.g., post-traumatic stress disorder, psychotic symptoms), quality of life, health risk behaviors, resilience, coping, and illness attitudes.

Finally, all data collection took place through the Internet and, in this regard, Gallagher and Incelli (2021) recommend caution when interpreting the data, because of the type of sampling and the methodology. Indeed, the authors point out that in many studies the subjects are often college students, with specific characteristics related to age and social role; otherwise, often the subjects are already interested in the dream world. To overcome these biases, they propose the implementation of a "blind" study, which does not let on from the beginning that the researchers' interest is in pandemic dreams, thereby moving questions related to COVID-19 to the last step of the administration process, after the dream narrative.

Theoretical Background of the Studies

The theoretical backgrounds of the analyzed studies, which ranged from psychoanalysis (e.g., Iorio et al., 2020; Giovanardi et al.,

2022; Mariani et al., 2021b), to cognitivism (e.g., Guo & Shen, 2021; Wang et al., 2021), to neuroscience (e.g., Margherita et al, 2022; Mota et al., 2020), each essentially refer to dreaming as a mental activity that regulates, integrates, and repairs waking life psychic processes, which are indicative of mental functioning as centered on the mental processing of emotional experiences. Dreaming is thus seen as a process that helps people to manage and regulate negative emotions and to learn from experience.

The most-represented theoretical hypotheses, however, are the Continuity Hypothesis (e.g., Barrett, 2001; Hartmann & Basile, 2003; Rosen et al., 1991; Schredl & Piel, 2006) and Threat Simulation Theory (TST; e.g., Guo & Shen, 2021; Revonsuo & Valli, 2008). These frameworks both insist on the elaborative function of dreaming, which helps with creative adaptation to difficult realities, as well as the integration and regulation of emotions. Some authors, however, also discuss the possible link between 'undreamed dreams' and psychopathology (e.g., Margherita et al., 2021), or the bidirectional dream-psychopathology relationship (e.g., Solomonova, 2021).

One final theoretical approach is the Multiple Code Theory (MCT; e.g., Bucci, 2021), according to which dreams differ in the way they represent different stages of the emotional arousal process. Some dreams are thus marked directly by arousal, while others are characterized by symbolization or reflection/reorganization (e.g., Mariani et al, 2021a).

The COVID-19 Pandemic as a Trauma

The pandemic is considered by most authors as a collective trauma. Indeed, 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; Necho et al., 2021; Sommantico, 2010; Usher et al., 2020). It is, therefore, not excessive to define this period as traumatic.

Therefore, many studies on natural and historical catastrophes (epidemics, earthquakes, terrorist attacks, wars, etc.) are cited, which consider dreams as 'windows on collective trauma,' with a 'traumatolytic' function (Ferenczi, 1932). In this framework, the dream repetition of the traumatic experience is not purely instinctual, but instead derives from the ego, which attempts to modify suffering related to the lived experience in an efficient and advantageous way. In this sense, the constructs of Post-Traumatic Stress Disorder (PTSD; e.g., Fränkl et al., 2021; Marogna et al., 2021) and Post-Traumatic Growth (PTG; e.g., Scarpelli et al., 2021b) are also considered relevant.

However, all studies emphasize the unprecedented aspects of the COVID-19 pandemic trauma: the global spread, home confinement (total and/or partial), sudden change in daily routines, and an 'infodemic' are all events without historical precedent. Only some of the studies point out an interesting similarity to the September 11, 2001 attack on the Twin Towers: the invisibility of the enemy (e.g., MacKay & DeCicco, 2020).

Most Prominent Sociodemographic Variables

While some authors are interested in investigating the dream as a 'collective laboratory,' as the pandemic may have activated socially shared mental processes (e.g., Monaco et al., 2022), most are primarily interested in studying the incidence of certain sociodemographic and individual variables. Classical variables (age, gender, socioeconomic or physical and mental health indicators, such as living with chronically ill people, etc.) and 'proximity to COVID-19' variables (having contracted the virus, knowing people who were sick or died from COVID-19, having changed or lost their job due to the pandemic, being a health worker, etc.) have been selected.

Most studies have highlighted age and gender differences. Thus, subjects who report longer dreams are women who also experience more distressing dreams as young adults (e.g., Conte et al., 2021; Guerrero-Gomez et al., 2021; Iorio et al., 2020; Musse et al., 2020; Parrello et al., 2021; Scarpelli et al., 2022; Schredl & Bulkeley, 2020; Sommantico, Iorio, & Parrello, 2021; Sommantico et al., 2022). With respect to explanatory hypotheses regarding gender differences, the reference is to biological and social factors: for women, hormones, worse quality of sleep, a greater incidence of precarious work, losing their jobs first, and caregivers experiencing a greater burden in family management without the help of the school and healthcare systems during lockdown (e.g., Alghamdi et al., 2022; Barrett, 2020; Giovanardi et al., 2022; Gorgoni et al., 2021; Kilius et al., 2021).

With regard to age differences, young adults, a great many of whom are college students, are considered to be by far the most affected by the pandemic (e.g., Conte et al., 2021; Giovanardi et al., 2021; Gorgoni et al., 2021; Parrello et al., 2021; Sommantico et al.,

2022). They are the only ones who have to leave their homes and then return to their families, at a developmental stage when autonomy is crucial. In addition, young adults have had to change their plans for study and, as highlighted in the international literature, are the population with the highest-ever levels of stress, even before the pandemic (e.g., Windarwati et al., 2022).

The few studies analyzing the adolescent population (e.g., Guerrero-Gomez et al., 2021; Parrello et al., 2021; Sommantico, Iorio, & Parrello, 2021), have shown an increase in the recall frequency of dreams and nightmares, especially in girls, who also showed significantly higher rates of negative emotions and higher rates of references to health and death. Furthermore, in their most recent dreams, girls more frequently reported a frustrating situation with higher negative emotions than boys, who reported more aggressive themes (Sommantico et al., 2015). Finally, adolescents who were more directly affected by the COVID-19 pandemic reported the strongest effects on their dreams, which tended to be shorter than those of the adult population. In interpreting these data, authors (e.g., Parrello et al., 2021; Sommantico, Iorio, & Parrello, 2021) have hypothesized an effect related to the type of information and the specific point of view spread by mass media during the first wave of the COVID-19 pandemic. Indeed, scientists, politicians, and opinion leaders have tried to engage younger people by emphasizing that they may be one of the primary sources of infection for their grandparents, who have been identified as individuals at high risk. However, the media's stance has very probably had the unforeseen effect of putting undue pressure on adolescents, by focusing on the consequences of their actions.

Quantitative Characteristics of Nightmares and Dreams

Regarding nightmare frequency, several studies found higher nightmare recall frequency in women than men during the COVID-19 pandemic, as well as in university students (e.g., Alghamdi et al., 2022; Fränkl et al., 2021; Giovanardi et al., 2022; Goncalves et al., 2022; Musse et al., 2020; Scarpelli et al., 2021a; Scarpelli et al., 2022; Solomonova et al., 2021). Furthermore, younger age was found to be associated with greater nightmare frequency (e.g., Guerrero-Gomez et al., 2021; Musse et al. 2020; Scarpelli et al., 2021a).

Regarding dream frequency, several studies found higher dream recall frequency, or a greater percentage of high dream recallers, in women than men during the COVID-19 pandemic (e.g., Iorio et al., 2020; Gorgoni et al., 2021; Frankl et al., 2021; Scarpelli et al., 2021a; Scarpelli et al., 2021b; Parrello et al., 2021). As mentioned earlier, women also had longer dreams which were characterized by a greater presence of negative emotions (e.g., Conte et al., 2021; Gorgoni et al., 2021; Gorgoni et al., 2022; Guerrero-Gomez et al., 2021; Iorio et al., 2020; Musse et al., 2020; Parrello et al., 2021; Scarpelli et al., 2022; Schredl & Bulkeley, 2020; Sommantico, Iorio, & Parrello, 2021; Sommantico et al., 2022). Furthermore, younger age was found to be associated with greater dream frequency and with a greater percentage of high dream recallers (e.g., Fränkl et al., 2021; Gorgoni et al., 2021; Gorgoni et al., 2022; Scarpelli et al., 2021a; Parrello et al., 2021; Sommantico, Iorio, & Parrello, 2021).

Qualitative Characteristics of Nightmares and Dreams

Dreams have sometimes been categorized through the construction of typologies based on codes, such as arousal, symbolism, and reflexivity (e.g., Mariani et al., 2021a), or functions, such as escape from threat, bereavement processing, non-remembering, and COVID-related content (e.g., Margherita et al., 2021).

As for analyses of the content of dream narratives, some studies rely on existing categorical models, such as the Hall and Van De Castle coding system (1966) (e.g., Le Bel & DeCicco, 2022; MacKay & DeCicco, 2020; Sommantico et al., 2022), while others use thematic textual analyses of various kinds, referring to settings, characters, animals, objects, actions, and emotions (e.g., Borghi et al., 2021; Cong et al., 2022; Giovanardi et al., 2021; Iorio et al., 2020; Margherita et al., 2021; Mariani et al., 2021b; Marogna et al., 2021; Monaco et al., 2022; Parrello et al., 2021; Pesonen et al., 2020; Solomonova et al., 2021; Sommantico, Iorio, Lacatena et al., 2021; Sommantico, Iorio, & Parrello, 2021).

Qualitative analyses of nightmares, which Goncalves and colleagues (2022) subdivide according to severity (mild, moderate, severe), initially represent content referring to anxiety and anxiogenic situations. Other frequent contents relate to situations of helplessness, separation from loved ones, failure, pursuits, and death (e.g., Kennedy et al., 2022; Kilius et al., 2021; Musse et al., 2021). Mourning, supernatural creatures, examination situations, and emotions such as fear, panic, phobia, and guilt may also be included (e.g., Alghamdi et al., 2022; Šćepanović et al., 2022; Solomonova et al., 2021).

Qualitative analyses of dreams revealed recurrent or specific content. Firstly, an increase in the theme of death was found in dreams from the pandemic era (e.g., Barrett, 2020; Borghi et al., 2021; Iorio et al., 2020; Parrello et al., 2021). The study by Pesonen and colleagues (2020) identifies a few prevalent pandemic themes, such as the failure of social distancing, coronavirus infection, personal protective equipment, dystopia, and apocalypse, while the study by Wang and colleagues (2021) mostly presents dreams of threatening events.

In some studies, themes are organized into clusters, often according to their processing function (e.g., Margherita et al., 2021; Mariani et al., 2021b; Marogna et al., 2021; Pesonen et al., 2020; Solomonova et al., 2021; Sommantico, Iorio, Lacatena et al., 2021; Sommantico, Iorio, & Parrello, 2021). The study by Margherita and colleagues (2021) identifies four clusters: escape from threat, grief work, unremembered dreams, and COVID-19 as manifest content. Similarly, the study by Solomonova and colleagues (2021) also identifies four clusters: ineffectiveness, human threat, death, and pandemic imagery. In the study by Monaco and colleagues (2022), two factors emerge: relationship with the outside (between containment and loss), and relationship with the inside (between processing and loss).

In the study by Giovanardi and colleagues (2021), relationships, human environment, natural environment, trials and challenges, COVID-19, violence, and bodily experiences emerged among the structural themes. These themes are further detailed in the studies of Marogna and colleagues (2021) and Cong and colleagues (2020), which also describe, among others, travel difficulties, overcrowding, obstacles in returning home,

failures, repeated attempts to do something, surgeries, quarantine, contagion, disease symptoms, apocalypse, chase/flight in war or migration, physical contact, elderly people in distress, cancellation of events, and COVID-19 contagion.

Many studies have paid attention to the settings of dreams in the pandemic era, noting a significant presence of closed, labyrinthine, or claustrophobic places with no way out (e.g., Borghi et al, 2021), in addition to outdoor, open spaces and escape routes characterized by an association with negative emotions in relation to dangerous, violent, and frustrating situations (e.g., Iorio et al., 2020; Margherita et al., 2021), or particularly crowded places (e.g., Iorio et al., 2020; Scarpelli et al., 2021b).

The predominant emotions are negative, such as fear of the other and of a hostile environment, or a sense of helplessness (e.g., Giovanardi et al., 2021; Sommantico, Iorio, & Parrello, 2021). In the study by Gorgoni and colleagues (2021), fear is the most common emotion, followed by surprise and sadness. Mota and colleagues (2020) report the recurrence of the words anger and sadness. In the study by Parrello and colleagues (2021), which involved a sample of adolescents, there are significantly high rates of dreams with negative emotions, such as anxiety, anger, and sadness, related to unusual transformations of settings and frustrating or dangerous situations. In the same study, character analysis shows concern for others, particularly friends, parents, and grandparents. Animals, as victims or aggressors, appear, as the result of a process of identification or metaphorization typical of childhood. In the study by Sommantico, Iorio, Lacatena, and Parrello (2021), there was also the presence of dreams related to pleasant memories which are now forbidden experiences. Finally, in the study by Cong

and colleagues (2020), dreams of having magical powers were highlighted, as the effect of an attempt to compensate for the sense of helplessness experienced in relation to the pandemic.

Many of the actions present in the dreams refer to relatedness and the body, presumably related to quarantine and the fear of contagion (e.g., MacKay & DeCicco, 2020; Parrello et al., 2021), but also to food and eating, as tied to the fear of scarcity of supplies (e.g., Cong et al., 2020; MacKay & DeCicco, 2020).

Furthermore, in studies such as those by Giovanardi and colleagues (2021) and Mariani and colleagues (2021b), a significant correlation between pandemic dreams and psychotherapy was found, hypothesizing that therapeutic dialogue may have helped dreamers to integrate their conscious everyday concerns with unconscious dream production.

Lastly, although a high percentage of dreams with explicit pandemic content was expected in the majority of studies, the latter was found to be present in only 5 to 20% of dream narratives.

Conclusions

This systematic research literature review aimed to comprehensively describe the influence of the COVID-19 pandemic on dreaming.

Most of the studies analyzed view the COVID-19 pandemic as a traumatic event that had severe psychological consequences in terms of altered sleep quality and increased psychological distress, anxiety, and depression. In particular, women, adolescents, and young adults emerge as the populations most affected by the pandemic, as well as those at greatest risk for psychological distress.

At the same time, the albeit varied theoretical backgrounds all converge in considering the dream as a mental activity reworking and transforming experienced trauma. The dream thus plays a role in managing and regulating emotions, especially negative ones such as fear and sadness, which emerged massively in the collected dream narratives.

From the analysis of the articles considered in the present review, recurrent and specific contents emerge in the dreams reported by the participants. In particular, an increase in the theme of death and mourning was highlighted, as well as a massive presence of themes such as social distancing/isolation, contagion, protective equipment, catastrophe/apocalypse, pursuit/escape, threat/danger, etc. These themes well account for the traumatic flow of what has been experienced worldwide in recent years, which seems to have profoundly affected social relations, as well as, more generally, the relationship between the subject and the outside world.

In this vein, it seems desirable that specific interventions, such as counseling services, individual and group psychotherapy, etc., already put in place to cope with the emerging psychological distress, be further implemented to respond, even in the long term, to the individual, relational, and collective crisis triggered by the COVID-19 pandemic.

In sum, and according to the Continuity Hypothesis of dreaming [which states that dream content reflects waking-life (e.g., Domhoff, 1996; Schredl, 2006)], the results of the review show how the subjective significance of catastrophic life events, such as the COVID-19 pandemic, can be reflected in dream content – e.g., in terms of dream tone, content, imagery, and length – due to emotional significance. Furthermore, in alignment

with the Continuity Hypothesis of dreaming and with psychoanalytic thinking, the results show how catastrophic events are reflected in dream life both directly, through realistic dreams and explicit references to Covid-19, as well as indirectly and symbolically.

In the same vein, according to psychoanalytic thinking (e.g., Adams-Silvan & Silvan, 1990; Freud, 1900; Sommantico, 2016; Velotti & Zavattini, 2019), dreams can be interpreted not only as an attempt at the fulfillment of repressed wishes, but also as a way to retroactively master and transform a waking life traumatic event (Freud, 1915-17; Sommantico, 2018). Indeed, as stated by Bryon (2021), dream contents during the pandemic "frequently [have] a collective overlay, an attempt by the dreamer's psyche to process the weight of the ongoing collective experience" (p. 402). This perspective demonstrates how the dream may act as a process of the reorganization of experiences, as well as of working through and processing the day's events, particularly traumatic events (Fosshage, 2007). Indeed, thanks to the review of the international research literature on dreaming during the COVID-19 pandemic, we have seen how the traumatic and unmetabolized elements (Bion, 1962; Bromberg, 2006) of daytime activity have found their expression, reorganization, and transformation in the dream world.

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.

Alfonsi, V., Gorgoni, M., Scarpelli, S., Zivi, P., Sdoia, S., Mari, E., … De Gennaro, L. (2021). Changes in sleep pattern and dream activity across and after the COVID-19 lockdown in Italy: A longitudinal observational study. *Journal of Sleep Research*, *31*, e13500. https://doi.org/10.1111/jsr.13500

Alghamdi, A.A., Alafif, N.O., BaHammam, A.S., Almuammar, M., Alharbi, N.S., Alhefdhi, N.A., … Al Muhanna, N.F. (2022). Nightmares' Pattern and Predictors among a Saudi University Students during COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, *19*, 1776. https://doi.org/10.3390/ijerph19031776

Barrett, D. (2020). Dreams about COVID-19 versus normative dreams: Trends by gender. *Dreaming*, *30*, 216-221. https://doi.org/10.1037/drm0000149

Barrett, D. (Ed.). (1996). *Trauma and dreams*. Cambridge, MA: Harvard University Press.

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. https://doi.org/10.1016/j.psychres.2020.113462

Bion, W.R. (1962). *Learning from experience*. London: Karnac.

Borghi, L., Bonazza, F., Lamiani, G., Musetti, A., Manari, T., Filosa, M., … Franceschini, C. (2021). Dreaming during lockdown: a quali-quantitative analysis of the Italian population dreams during the first COVID-19 pandemic wave. *Research in Psychotherapy: Psychopathology, Process and Outcome*, *24*, 200-211. https://doi.org/10.4081/ripppo. 2021.547

Bottary, R., Simonelli, G., Cunningham, T.J., Kensinger, E.A., & Mantua, J. (2020). Sleep extension: an explanation for increased pandemic dream recall? *Sleep*, 43, zsaa131. https://doi.org/10.1093/sleep/zsaa131.

Bradshaw, S., Lafrenière, A., Amini, R., Lortie-Lussier, M., & De Koninck, J. (2016). Threats in dreams, emotions, and the severity of threatening experiences in waking. *International Journal of Dream Research*, *9*, 102-109. http://dx.doi.org/10.11588/ijodr.2016.2.27214

Bromberg, P. M. (2006). *Awakening the dreamer: Clinical journeys*. El Dorado Hills, CA: Analytic Press.

Bryon, D. (2021). Processing trauma in psychoanalysis in 'real' time and in dreams: the convergence of past, present and future during COVID-19. *Journal of Analytical Psychology*, *66*, 399-410. https://doi.org/10.1111/1468-5922.12695

Bucci, W. (2021). *Emotional Communication and Therapeutic Change Understanding Psychotherapy Through Multiple Code Theory*. London: Routledge. https://doi.org/10.4324/9781003125143

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. https://doi.org/10.1016/j.sleep.2020.05.011

Chen, Y., Xiao, Y., Yi, X., Zhang, M., Yu, Y., Wei, L., . . . Wang, D. (2010). An investigation report on the typical dreams of Chinese college students. *Journal of Educational Development*, *9*, 46-50. https://doi.org/10.3969/j.issn.1005-3476.2010.09.012

Cong, B., Xue, M., & Ye, Y. (2022). Relationships between attitudes toward dreams, typical dreams, and emotions among Chinese college students. *Dreaming*, *32*, 1-14. https://doi.org/10.1037/drm0000191

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. https://doi.org/10.1111/jsr.13425

Davidson, J., & Lynch, S. (2012). Thematic, literal, and associative dream imagery following a high-impact event. *Dreaming*, *22*, 58-69. http://dx.doi.org/10.1037/a0026273

Di Trani, M., Mariani, R., Renzi, A., Greenman, P.S. & Solano, L. (2018). Alexithymia according to Bucci's multiple code theory: A preliminary investigation with healthy and hypertensive individuals. *Psychology and Psychotherapy: Theory, Research, and Practice*, *91*, 232-247. https://doi.org/10.1111/papt.12158

Domhoff, G. W. (2003). *The scientific study of dreams: Neural networks, cognitive development, and content analysis*. Washington, DC: American Psychological Association. https://doi.org/10.1037/10463-000

Ferenczi, S. (1932). On the revision of the interpretation of dreams. In S. Ferenczi, *Final contributions to the problems and methods of psycho-analysis* (pp. 240). London: Hogarth, 1955.

Ferro, A. (2002). Some implications of Bion's thought: The waking dream and narrative derivatives. *The International Journal of Psychoanalysis*, *83*, 597-607. https://doi.org/10.1516/WV5M-TR9T-9HPY-RFVJ

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. https://doi.org/10.3390/ijerph18147638

Fosshage, J. (1983). The psychological function of dreams. A revised psychoanalytic perspective. *Psychoanalysis & Contemporary Thought*, *6*, 641–669.

Fosshage, J.L. (2007). The organizing functions of dreaming: pivotal issues in understanding and working with dreams. *International Forum of Psychoanalysis*, *16*, 213-221. https://doi.org/10.1080/08037060701442166

Fränkl, E., Scarpelli, S., Nadorff, M.R., Bjorvatn, B., Bolstad, C.J., Chan, N.Y. … Holzinger, B. (2021). How our Dreams Changed During the COVID-19 Pandemic: Effects and Correlates of Dream Recall Frequency - a Multinational Study on 19,355 Adults. *Nature and Science of Sleep*, *13*,1573-1591. https://doi.org/10.2147/NSS.S324142

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.

Gallagher, S.P., & Incelli, N.A. (2021). Pandemic dreams are susceptible to priming and unrelated to COVID-19 exposure. *Journal of Evidence-Based Psychotherapies*, *21*, 189-206. https://doi.org/10.24193/jebp.2021.2.18

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. https://doi.org/10.3390/ijerph17228390

Gennaro, A., Kipp, S., Viol, K., de Felice, G., Andreassi, S., Aichhorn, W., … Schiepek, G. (2020). A phase transition of the unconscious: automated text analysis of dreams in psychoanalytic psychotherapy. *Frontiers in Psychology*, *11*, 1667. https://doi.org/10.3389/fpsyg.2020.01667

Giovanardi, G., Fiorini Bincoletto, A., Baiocco, R., Ferrari, M., Gentile, D., Siri, M., … Lingiardi, V. (2022). Lockdown Dreams: Dream Content and Emotions During the COVID-19 Pandemic in an Italian Sample. *Psychoanalytic Psychology*, *39*, 111-126. https://doi.org/10.1037/pap0000385

Goncalves, M. Henriques, A., Costa, A.R., Correia, D., Severo, M., Lucas, R. … Leão, T. (2022). Insomnia and nightmare profiles during the COVID-19 pandemic in Portugal: characterization and associated factors. *Sleep Medicine*, *90*, 44-52, https://doi.org/10.1016/j.sleep.2021.12.018

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. doi:10.1016/j.sleep.2021.02.006

Gorgoni, M., Scarpelli, S., Alfonsi, V., Annarumma, L., Pellegrini, E., Fasiello, E., … De Gennaro, L. (2022). The Oneiric Activity during and after the COVID-19 Total Lockdown in Italy: A Longitudinal Study. *International Journal of Environmental Research and Public Health*, *19*, 3857. https://doi.org/10.3390/ijerph19073857

Grotstein, J. (2000). *Who is the dreamer who dreams the dream? A study of psychic presences*. London: Routledge.

Guerrero-Gomez, A., Nöthen-Garunja, I., Schredl, M., Homberg, A., Vulcan, M., Brusić, 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. https://doi.org/10.3389/fpsyg.2021.652627

Guo, H., & Shen, H. (2021). Media Exposure to COVID-19 Epidemic and Threatening Dream Frequency: A Moderated Mediation Model of Anxiety and Coping Efficacy. *Dreaming*, *31*, 1-19. https://doi.org/10.1037/drm0000159

Gupta, M.A. (2020). Spontaneous reporting of onset of disturbing dreams and nightmares related to early life traumatic experiences during the COVID-19 pandemic by patients with post-traumatic stress disorder in remission. *Journal of Clinical Sleep Medicine*, *16*, 1419-1420. https://doi.org/10.5664/jcsm.8562

Hall, C. S., & Van de Castle, R. L. (1966). *The content analysis of dreams*. New York, NY: Appleton-Century-Crofts.

Hartmann, E. (2011). *The nature and functions of dreaming*. Oxford: Oxford University Press.

Hartmann, E., & Basile, R. (2003). Dream imagery becomes more intense after 9/11/01. *Dreaming*, *13*, 61-66. http://dx.doi.org/10.1023/A:1023398924124

Hill, C. E., Diemer, R. A., & Heaton, K. J. (1997). Dream interpretation sessions: Who volunteers, who benefits, and what volunteer clients view as most and least helpful. *Journal of Counseling Psychology*, *44*, 53-62. https://doi.org/10.1037/0022-0167.44.1.53

Iorio, I., Sommantico, M., & Parrello, S. (2020). Dreaming in the time of COVID-19: A quali-quantitative Italian study. *Dreaming, 30*, 199-215. https://doi.org/10.1037/drm0000142

Kennedy, K.E.R., & Grandner, M.A. (2021). Sleep, Dreams, and Nightmares During the COVID-19 Pandemic. *American Journal of Health Promotion*, *35*, 1168-1173. https://doi.org/10.1177/08901171211055312

Kennedy, K.E.R., Bastien, C.H., Ruby, P.M., Killgore, W.D.S., Wills, C.C.A., & Grandner, M.A. (2022). Nightmare content during the COVID-19 pandemic: Influence of COVID-related stress and sleep disruption in the United States. *Journal of Sleep Research*, *31*, e13439. https://doi.org/10.1111/jsr.13439

Kilius, E., Abbas, N.H., McKinnon, L., & Samson, D.R. (2021). Pandemic Nightmares: COVID-19 Lockdown Associated With Increased Aggression in Female University Students' Dreams. *Frontiers in Psychology*, *12*, 644636. https://doi.org/10.3389/fpsyg.2021.644636

Le Bel, S., & DeCicco, T.L. (2022). What dreams reveal about people's emotional state due to the impacts of COVID-19. *International Journal of Dream Research*, *15*, 18-26. https://doi.org/10.11588/ijodr.2022.1.82110

Liberati, A., Altman, D.G., Tetzlaff, J., Mulrow, C., Gøtzsche, P.C., Ioannidis, J.P.A., … Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *BMJ*, *339*, b2700. https://doi.org/10.1136/bmj.b2700

MacKay, C., & DeCicco, T.L. (2020). Pandemic Dreaming: The Effect of COVID-19 on Dream Imagery, a Pilot Study. *Dreaming*, *30*, 222-234. https://doi.org/10.1037/drm0000148

Malinowski, J., & Horton, C. L. (2014). Evidence for the preferential incorporation of emotional waking-life experiences into dreams. *Dreaming*, *24*, 18-31. https://doi.org/10.1037/a0036017

Malinowski, J.E. (2015). Dreaming and personality: Wake-dream continuity, thought suppression, and the Big Five Inventory. *Consciousness and Cognition*, *38*, 9-15. https://doi.org/10.1016/j.concog.2015.10.004

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. https://doi.org/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. https://doi.org/10.3389/fpsyg.2021.745081

Mariani, R., Maskit, B., Bucci, W., & De Coro, A. (2013). Linguistic measures of the referential process in psychodynamic treatment: the English and Italian versions. *Psychotherapy Research*, *23*, 430-447. https://doi.org/10.1080/10503307.2013.794399

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. https://doi.org/10.4081/ripppo.2021.537

Marogna, C., Montanari, E., Contiero, S., & Lleshi, K. (2021). Dreaming during COVID-19: the effects of a world trauma. *Research in Psychotherapy: Psychopathology, Process and Outcome*, *24*, 188-199. https://doi.org/10.4081/ripppo.2021.541

Monaco, S., Citti, T., Gaudio, B., Mariani, R., & Di Trani, M. (2022). "Dreams Drawer": Analysis of Dreams During Lockdown in the Italian Population. *Dreaming*. First Online April 14. https://dx.doi.org/10.1037/drm0000205

Mota, N.B., Weissheimer, J., Ribeiro, M., de Paiva, M., Avilla-Souza, J., Simabucuru, G., … Ribeiro, S. (2020) Dreaming during the Covid-19 pandemic: Computational assessment of dream reports reveals mental suffering related to fear of contagion. *PLoS ONE*, *15*, e0242903. https://doi.org/10.1371/journal.pone.0242903

Musse, F.C.C., Castro, L.d.S., Sousa, K.M.M., Mestre, T.F., Teixeira, C.D.M., Pelloso, S.M. … Carvalho, M.D.d.B. (2020). Mental Violence: The COVID-19 Nightmare. *Frontiers in Psychiatry*, *11*, 579289. https://doi.org/10.3389/fpsyt.2020.579289

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. https://doi.org/10.1177/00207640211003121

Negri, A., Esposito, G., Mariani, R., Savarese, M., Belotti, L., Squitieri, B., & Bucci, W. (2018). *The Italian weighted reflection and reorganization list (I-WRRL): A new linguistic measure detecting the third phase of the referential process*. Paper presented at: XII Congresso Nazionale della Società per la Ricerca in Psicoterapia SPR-Italia, Palermo, Italy.

Nielsen, T., Zadra, A., Simard, V., Saucier, S., Stenstrom, P., Smith, C., … Kuiken, D. (2003). The typical dreams of Canadian university students. *Dreaming*, *13*, 211-235. https://doi.org/10.1023/B:DREM.0000003144.40929.0b

Parrello, S., Sommantico, M., Lacatena, M., & Iorio, I. (2021). Adolescents' dreams under Covid-19 isolation. *International Journal of Dream Research*, *14*, 10-20. https://doi.org/10.11588/ijodr.2021.1.73858

Pennebaker, J.W., Boyd, R.L., Jordan, K., & Blackburn, K. (2015). *The development and psychometric properties of LIWC2015*. Austin: University of Texas at Austin.

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. https://doi.org/10.3389/fpsyg.2020.573961

Pöstenyi, A. (1996). Hitom lustprincipen. Dröm, trauma, dödsdrift [Beyond the pleasure principle. Dream, trauma, death drive]. *Divan*, *3*, 4-16.

Revonsuo, A., & Valli, K. (2008). How to test the threat-simulation theory. *Consciousness and Cognition*, *17*, 1292-1296. https://doi.org/10.1016/j.concog.2008.01.007

Roussy, F., Camirand, C., Foulkes, D., de Koninck, D., Loftis, J., & Kerr, N. H. (1996). Does early-night REM dream content reliably reflect presleep state of mind? *Dreaming*, *6*, 121-130. https://doi.org/10.1037/h0094450

Scarpelli, S. Alfonsi, V., Mangiaruga, A., Musetti, A., Quattropani, M. C., Lenzo, V. … Franceschini, C. (2021). Pandemic nightmares: Effects on dream activity of the COVID-19 lockdown in Italy. *Journal of Sleep Research*, First Online 6 February. https://doi.org/10.1111/jsr.13300

Scarpelli, S., Alfonsi, V., D'Anselmo, A., Gorgoni, M., Musetti, A., Plazzi, G., … Franceschini, C. (2021). Dream Activity in Narcoleptic Patients During the COVID-19 Lockdown in Italy. *Frontiers in Psychology*, *12*, 681569. https://doi.org/10.3389/fpsyg.2021.681569

Scarpelli, S., Alfonsi, V., Gorgoni, M., Musetti, A., Filosa, M., Quattropani, M.C., … Franceschini, C. (2021). Dreams and Nightmares during the First and Second Wave of the COVID-19 Infection: A Longitudinal Study. *Brain Sciences*, 11, 1375. https://doi.org/10.3390/brainsci11111375

Scarpelli, S., Gorgoni, M., Alfonsi, V., Annarumma, L., Di Natale, V., Pezza, E., & De Gennaro, L. (2021). 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. https://doi.org/10.1111/jsr.13429

Scarpelli, S., Nadorff, M.R., Bjorvatn, B., Chung, F., Dauvilliers, Y., Espie, C.A., … De Gennaro, L. (2022). Nightmares in People with COVID-19: Did Coronavirus Infect Our Dreams? *Nature and Science of Sleep*, *24*, 14:93-108. https://doi.org/10.2147/NSS.S344299.

Šćepanović, S., Aiello, L.M., Barrett, D., & Quercia, D. (2022) Epidemic dreams: dreaming about health during the COVID-19 pandemic. *Royal Society Open Science*, *9*, 211080. https://doi.org/10.1098/rsos.211080

Šćepanović, S., Martin-Lopez, E., Quercia, D., & Baykaner, K. (2020). *Extracting medical entities from social media*. In CHIL '20: ACM Conference on Health, Inference, and Learning, Toronto, Canada. https://doi.org/ 10.1145/3368555.3384467

Schredl, M. & Bulkeley, K. (2020). Dreaming and the COVID-19 pandemic: A survey in a U.S. sample. *Dreaming*, *30*, 189-198. https://doi.org/10.1037/drm0000146

Schredl, M., & Piel, E. (2006). War-related dream themes in Germany from 1956 to 2000. *Political Psychology*, *27*, 299-307. http://dx.doi.org/10.1111/j.1467-9221.2006.00008.x

Schredl, M., Berres, S., Klingauf, A., Schellhaas, S., & G ritz, A. S. (2014). The Mannheim Dream Questionnaire (MADRE): Retest reliability, age, and gender effects. *International Journal of Dream Research*, 7, 141-147. http://dx.doi.org/10.11588/ijodr.2014.2.16675

Sierro, C., Leslie, W., & Putois, B. (2020). Long-term effects of treatment for chronic nightmares: is imagery rehearsal therapy robust in the COVID-19 pandemic? *Journal of Clinical Sleep Medicine*, *16*, 1993. https://doi.org/10.5664/jcsm.8742

Solomonova, E., Picard-Deland, C., Rapoport, I.L., Pennestri, M-H., Saad, M., Kendzerska, T., … Robillard, R. (2021). Stuck in a lockdown: Dreams, bad dreams, nightmares, and their relationship to stress, depression, and anxiety during the COVID-19 pandemic. *PLoS ONE*, 16, e0259040. https://doi.org/10.1371/journal.pone.02590

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. https://doi.org/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. https://doi.org/10.3917/rfp.825.1475

Sommantico, M. DeCicco, T.L., Osorio Guzmán, M., Prado Romero, C., Le Bel, S., & Parrello, S. (2022). Illness Attitudes, Mood, and Dreams During the Second Wave of the COVID-19 Pandemic: An International Study. *International Journal of Dream Research*, *15*, 104-117, https://doi.org/10.11588/ijodr.2022.1.84712

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. https://doi.org/10.3280/PDS2015-003006

Sommantico, M., Iorio, I., Lacatena, M., & Parrello, S. (2021). Dreaming during COVID-19 lockdown: A comparison between Italian adolescents and adults. *Research in Psychotherapy: Psychopathology, Process and Outcome, 24*, 212-223. https://doi.org/10.4081/ripppo.2021.53

Sommantico, M., Iorio, I., Parrello, S. (2021). Mood, sleep quality, and dreaming during the third wave of the COVID-19 pandemic in Italy. *International Journal of Dream Research*, *14*, 309-319. https://doi.org/10.11588/ijodr.2021.2.82109

Tuominen, J., Stenberg, T., Revonsuo, A., & Valli, K. (2019). Social contents in dreams: An empirical test of the Social Simulation Theory. *Consciousness and Cognition*, *69*, 133-145. https://doi.org/10.1016/j.concog.2019.01.017

Usher, K., Durkin, J., & Bhullar, N. (2020). The COVID-19 pandemic and mental health impacts. *International Journal of Mental Health Nursing*, *29*, 315-18. https://doi.org/10.1111/inm.12726

Varvin, S., Fischmann, T., Jovic, V., Rosenbaum, B., & Hau, S. (2012). Traumatic dreams: Symbolisation Gone Astray. In P. Fonagy, H. Kächele, M. Leuzinger-Bohleber, & D. Taylor (Eds.), *Significance of dreams: Bridging clinical and extraclinical research in psychoanalysis* (pp. 182–211). London: Karnac.

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. https://doi.org/10.1421/94505

Wang, J., Zemmelman, S.E., Hong, D., Feng, X., & Shen, H. (2021). Does COVID-19 impact the frequency of threatening events in dreams? An exploration of pandemic dreaming in light of contemporary dream theories. *Consciousness and Cognition*, *87*, 103051, https://doi.org/10.1016/j.concog.2020.103051

Windarwati, H.D., Lestari, R., Supianto, A.A., Wicaksono, S.A., Ati, N.A.L., Kusumawati, M.W. … Ekawati. D. (2022). A narrative review into the impact of COVID-19 pandemic on senior high school adolescent mental health. *Journal of Child and Adolescent Psychiatric Nursing*, First Online Feb 23. https//doi.org/10.1111/jcap.12370