

Dreaming

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Trauma or Transcendence? The Relationship Between Near-Death Experiences and Dreaming


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Near-death experiences (NDEs) are exceptional states of consciousness reported by many individuals who come close to death. Unusual dream phenomena such as more intense and vivid dreams, higher dream recall, and increased lucid dreaming have been purported to occur after NDEs, however, a comprehensive assessment of the dream experiences and attitudes of NDE survivors remains unexplored. Moreover, it remains unknown whether anomalous dream experiences stem from the actual NDE or the traumatic experience of coming close to death. In this study, 138 NDE survivors, 45 participants who experienced a life-threatening event but without NDE, and 129 participants who had never come close to death completed a quantitative questionnaire assessing trauma symptoms and a range of dream-related variables. The NDE group reported significantly more lucid dreams, creative and problem-solving dreams, precognitive dreams, and out-of-body experiences during sleep than both other groups of participants. Furthermore, these experiences appeared to be primarily related to the NDE rather than trauma symptomology.

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Findings continue to suggest a relationship between nonordinary states and expanded awareness more broadly—whether experienced during sleep or wakefulness—offering further insights into the phenomenon of consciousness in general.

Keywords: near-death experiences, lucid dreaming, precognitive dreams, out-of-body experiences, paranormal experiences

Near-death experiences (NDEs) are profound, altered states of consciousness reported by approximately 10%–18% of individuals who come close to death (Greyson, 2003; Parnia et al., 2001; Rousseau et al., 2023; van Lommel et al., 2001). Comprised of a consistent pattern of clinically recognizable features, NDEs are primarily characterized by heightened sensoria and expanded awareness, temporal distortions, intensified emotional affect (e.g., joy or peace, or, less commonly, terror), out-of-body experiences (OBEs), and other perceptual anomalies such as bright or unusual light and encountering noncorporeal beings. Although cultural diversity in NDE research remains limited, the phenomenology of NDEs has shown a remarkable degree of stability across a diversity of geographical and cultural contexts (Belanti et al., 2008). While the prevalence and interpretation of specific elements within NDEs may differ, consistencies in the core experience can challenge conventional Western beliefs about consciousness, perception, and the mind–brain relationship (Agrillo, 2011). At the very least, NDEs offer valuable insights into the functioning of the brain under extreme conditions and, at most, clues about the fundamental nature of human existence.

NDEs attract research attention not only due to their enigmatic nature but propensity for stimulating positive life changes. Commonly referred to as aftereffects, NDEs frequently catalyze a wide range of significant attitudinal and value changes in the experiencer that are seemingly maintained over time, including over decades (Greyson, 2022; van Lommel et al., 2001). Some evidence also indicates that neurophysiological alterations may occur in association with NDEs, tentatively suggesting change is not solely psychological in nature. Self-reported physical changes include increased electromagnetic sensitivity, heightened senses, hypersensitivity to light, extra-sensory perceptions, skin sensitivities, and dietary changes, among others (e.g., Fracasso & Friedman, 2012; Greyson, 1983b; Greyson et al., 2015; Lindsay & Tassell-Matamua, 2020; Nouri & Holden, 2008; Ring & Rosing, 1990).

Sleep is a fundamental aspect of health and well-being across the lifespan, important for waking function and mood, as well as long-term mental and physical health (Foley et al., 2004; Hale et al., 2020). Both informal and scholarly literature have identified several subjectively reported sleep anomalies among those who have had NDEs. Such changes include shorter sleep duration, longer sleep latency, more sleep disturbances, more vivid dreams, fewer rapid eye movement (REM) sleep periods, and increased REM intrusion during wakefulness or during hypnagogic or hypnopompic states (Britton & Bootzin, 2004; Kondziella et al., 2019; Lindsay & Tassell-Matamua, 2020; Lindsay et al., 2023; Nelson et al., 2006, 2007). Lindsay et al. (2023) recently used subjective sleep scales and wrist-worn actigraphy, a validated objective measure, to record core details concerning sleep timing, duration, efficiency, and regularity of sleep among those who have experienced NDEs. The authors found the NDE group was significantly more likely to self-report dysfunctional sleep compared to an age- and gender-matched control group. A significant, positive correlation was also observed between subjective sleep assessments and NDE phenomenology, suggesting that more intense or “deeper”

experiences were associated with greater sleep disturbance, lending further support to the possibility of a link between NDEs and sleep dysfunction. However, these findings were not corroborated by the actigraphy data. Instead, the NDE group demonstrated moderate levels of sleep state misperception (SSM), also known as “paradoxical insomnia”—that is, a mismatch between subjective and objective sleep assessments whereby individuals typically report less sleep than what is objectively observed (Pace-Schott & Picchioni, 2005; Rezaie et al., 2018). To account for this difference, Lindsay et al. (2023) reflected on the role of internal, subjective characteristics of sleep, such as dream experiences, as a potential mediator for SSM among those who have had NDEs. While the cause of SSM remains unknown, increased perceptions of wakefulness have been associated with heightened states of arousal and REM sleep, a brain state commonly associated with dreaming (Castelnovo et al., 2021; Hobson, 2009), lending support to this theory. Previous research suggests that unusual dream phenomena such as more vivid dreams, higher dream recall, and increased lucid dreams might increase after an NDE (Funkhouser, 2021; Greyson, 1983b; Kohr, 1983; Sutherland, 1988), however, a comprehensive assessment of the dream experiences of NDE survivors, including whether they diverge from those who have not experienced NDEs, remains unexplored.

Dreams, Influences on Dreaming, and Atypical Dream States

The phenomenon of dreaming has captivated humanity throughout the ages. Although continuing to hold special significance for many people and cultures contemporaneously, from a scientific perspective the precise meaning and function of dreams remains elusive (Leonard & Dawson, 2018). Like NDEs, the study of dreams presents significant methodological challenges. The positivist natural scientific method is somewhat suspicious of subjectivity, considering it to be less reliably informative than objective observations (Pérez-Álvarez, 2018). Research has therefore predominately focused on the neurophysiological correlates of dreaming at the expense of phenomenology and meaning (Reiser, 2001). Outside of mapping neural correlates, most psychological dream research has focused on self-reported frequency, vividness, and content (Siclari et al., 2020). Dream content and recall have been correlated with several factors. Healthy adults recall around one dream per week; younger people tend to recall dreams more than older people, peaking in early adulthood; and women are more likely to recall dreams, have more creative or problem-solving dreams, experience more nightmares and negative dream content compared to men (Pagel & Kwiatkowski, 2003; Siclari et al., 2020). In terms of personality variables, nightmare frequency and the emotional valence of dream content have been associated with factors such as neuroticism, thin boundaries, and inversely, trait mindfulness, as well as several psychological disorders, notably stress, anxiety, depression, and posttraumatic stress disorder (PTSD) (Schredl & Goeritz, 2019; Simor et al., 2011; Solomonova et al., 2021).

The relationship between exposure to trauma, sleep, and dreaming is one of the more intensively studied aspects of sleep research. Disruptions to sleep such as insomnia, shorter sleep duration, taking longer to fall asleep, frequent awakenings, excessive nocturnal motor movements during sleep, and nightmares are often reported following traumatic events, with 70%–91% of PTSD patients reporting such symptoms (Giannakopoulos & Kolaitis, 2021). Of these, around 50%–70% report recurrent posttraumatic nightmares, defined as “repeated occurrences of extremely dysphoric and well-remembered dreams that usually involve subjective threats to survival, security, or

physical integrity” (W. E. Kelly & Mathe, 2019, p. 180; Leskin et al., 2002). Not only are nightmares considered a hallmark of PTSD, but their occurrence is thought to exacerbate other PTSD symptoms and the severity of the disorder (Campbell & Germain, 2016).

More frequent, vivid dreams with intensified emotional tone can also follow traumatic or highly stressful events, regardless of whether PTSD is present or not (Mysliwiec et al., 2014; San Martin et al., 2020). For instance, research examining dreaming experiences among the general population during COVID-19 pandemic lockdown periods found a higher incidence of reported nightmares and bizarre dream content, more vivid dreams, and increased dream recall compared to pre-pandemic levels (Gorgoni et al., 2021; Kilius et al., 2021; Schredl & Bulkeley, 2020; Solomonova et al., 2021). Frequency of bad dreams and nightmares was found to be greater among individuals with higher stress levels.

Other unusual sleep states have also been reported in association with stress and trauma, most commonly, increased incidence of lucid dreaming, OBEs, and sleep paralysis. While the underlying mechanism of lucid dreaming remains unknown, lucid dreams are often referred to as a hybrid sleep/wake state (Voss et al., 2009), or more recently, a highly activated REM state (Baird et al., 2022). Lucid dreaming differs from normal dreaming in that sleepers are aware they are dreaming and are often able to exert varying levels of control over their dreams, including the ability to awaken themselves. Proneness to lucid dreams has been associated with several personality characteristics, such as creativity, higher internal locus of control, divergent thinking, interest in and positive attitudes to dreams, and thin boundaries (Cernovsky, 1984; Schredl & Erlacher, 2007; Stumbrys & Daniels, 2010; Zink & Pietrowsky, 2013). Women are more likely to report lucid dreams, perhaps because women are also more likely to exhibit greater interest in dreams and increased recall (Pagel & Kwiatkowski, 2003; Schredl & Erlacher, 2011). Whether or not lucid dreams are symptomatic of positive well-being or psychopathology is unclear, with highly ambiguous findings across studies. While regular lucid dreamers exhibit many healthy adaptive traits such as emotional stability, self-confidence, self-actualization, and better mental health (LaBerge, 1988), lucid dreams have also been associated with psychopathological symptoms such as stress, trauma, dissociation, and schizotypy symptoms (Aviram & Soffer-Dudek, 2018; P. Kelly et al., 2022; Scarpelli et al., 2021).

Stress or trauma can also trigger a parasomnia known as sleep paralysis (Denis et al., 2018). Sleep paralysis typically occurs during transitional sleep states (the onset of sleep or awakening from sleep) and includes features such as panic and fear, muscular paralysis, a sensed “evil” presence or intruder, and other vivid sensory-motor hallucinations such as OBEs, pressure on the chest and frightening auditory or visual hallucinations (Cheyne, 2005; Denis et al., 2018). Often associated with sleep paralysis are OBEs, whereby the “self” or locale of consciousness feels as though it has separated from the material body, with experiencers typically able to view their body and immediate physical surroundings from an external vantage point (Blackmore, 1984; Cheyne, 2005; de Sá & Mota-Rolim, 2016; Herrero et al., 2023; Irwin, 1988; LaBerge, 1988, 2014).

Other atypical modes of dreaming are precognitive or prophetic dreams, defined as a “dream that seemingly includes knowledge about the future which cannot be inferred from actually available information” (Schredl, 2009, p. 83). Like lucid dreams, precognitive dreams are commonplace with approximately 30%–60% of people claiming to have experienced a precognitive dream at least once in their lifetime (Eranimos & Funkhouser, 2023; Haraldsson, 1985; Pechey & Halligan, 2012;

Sherwood & Roe, 2013; Van de Castle, 1977). Similar to lucid dreaming and OBE episodes, precognitive dreams tend to be vivid, clear, and emotionally intense compared to ordinary dreams (Parra, 2013). Despite their apparent ubiquity, precognitive dreams are not well understood, are little studied, and are often relegated to the domain of parapsychology, perhaps due to their ostensible contradiction of established scientific laws and principles. Like other types of unusual dreams, an increased prevalence of precognitive dreaming has been linked to stress and trauma, specifically childhood trauma and poor sleep quality (Sar et al., 2014; Valášek & Watt, 2015).

The relationship between trauma and dreaming has relevance for research examining dreaming among survivors of NDEs, given a significant portion of experiences occur in the context of acute and distressing life-threatening events, such as near-drowning, traffic accidents, assault, or combat-related injury. Consideration of the sleep status and dream characteristics of those who have had NDEs must therefore consider the role of psychological trauma as an explanation for any deviation from population norms. It is entirely possible that any alterations in sleep/dreaming may be a corollary of trauma experience, rather than anything specific to the NDE.

The following study aims to further understand the dream-related experiences that occur in association with NDEs, a profound yet fleeting exceptional experience of consciousness that can occur near death and have lasting effects. Although previous studies have explored observable, quantifiable sleep indicators such as sleep duration, latency, and efficacy in relation to NDEs, less is known about inner, subjective experiences such as dreaming. A further goal was to ascertain whether any variations in dreaming could be reliably linked to the conscious experience of the NDE (phenomenology) or instead to psychological or physical trauma (pathology) that can often accompany a near-death event. To better understand where any differences may arise, we assessed three groups of participants; those who have had NDEs in the context of a life-threatening episode (NDE group), those who have experienced a life-threatening episode but not the subjective phenomena characteristic of NDEs (non-NDE), and those who had never experienced a life-threatening event (control).

Material and Method

Participants

Three hundred twelve participants (210 female, 96 male, two nonbinaries; 18–65+ years old) completed an online survey. While a range of nationalities and ethnicities were represented, the majority of participants were New Zealand European (45.8%) followed by North American (16.7%) and European (12.8%). Of the 312 participants, 138 were assigned to the NDE group (92 female, 41 male, one nonbinary; 18–65+ years), 45 to the non-NDE group (31 female, 14 male; 18–65+ years), and 129 to the control group (87 female, 41 male, one nonbinary; 18–65+ years). The NDE group consisted of participants who reported a near-death event and met the criteria for an NDE according to scores on the Near-Death Experience Scale (NDE Scale; a score of 7 or more; Greyson, 1983a). Participants who reported having a near-death event but did not meet Greyson's (1983a) criteria for an NDE comprised the non-NDE group. The remaining 129 did not report a near-death event of any kind, so were assigned to a third group considered to be representative of average sleepers among the general population.

Procedure

The self-administered online questionnaire was created and hosted using Qualtrics online software. Participants were self-selected and recruited via existing acquaintance networks, Massey University Facebook groups, and through advertisements on NDE websites including the International Association for Near-Death Studies and the Near-Death Experience Research Foundation. Eighty participants representative of the general population of Aotearoa New Zealand were recruited via Prolific (<https://www.prolific.com>)—an academic and research recruitment panel. These participants were predominately allocated into the control group. The participants completed the online survey between May 2022 and March 2023. Ethics approval for the study was granted by the Massey University Human Ethics Committee: Southern A, Application 20/55.

Measures

The questionnaire was comprised of several demographic questions, items relating to the near-death event, and three well-established psychometric measures. Demographic questions captured age, gender, ethnicity, level of education, and marital status. Additional questions tapped proximity to death during the near-death event (1 = *not physically close to death*, 2 = *physically close to death/dying*, 3 = *physically dead*), time elapsed since the near-death event, and presence of a medical condition (yes/no).

The 16-item NDE Scale (Greyson, 1983a) is a widely used, reliable, and valid tool designed to measure whether an NDE occurred during the near-death event. Total scores on the NDE Scale range from 0 to 32, with a score of 7 or greater considered indicative of an NDE. Higher scores or the presence of more phenomenological characteristics such as positive affect, OBEs, altered perceptions of time, and bright light indicate “deeper” or more intense NDEs.

The 22-item Impact of Event Scale-Revised (IES-R; Weiss, 2007), a well-established tool with excellent psychometric properties, was used to assess trauma-related symptoms. In addition to a total score, three subscale scores assessing specific clusters of symptoms are calculated; intrusion (reoccurring thoughts and imagery), avoidance (effortful avoidance of situations that serve as reminders of the trauma), and hyperarousal (physiological hyperarousal).

Questions relating to dream experiences and attitudes were extracted from the Mannheim Dream Questionnaire (MADRE; Schredl et al., 2014), which includes questions about dreaming history and frequency, such as dream recall, emotional intensity of dreams, nightmare frequency, lucid dreams, interest and attitudes toward dreams. Three additional questions were created for this study to assess the frequency of precognitive dreams, sleep paralysis, and OBEs while sleeping. A Likert-type scale was presented for each item (see Table 1). For analyses, three items relating to interest in dreams were combined to form the interest subscale (MADRE Items 12b, 12d, 12f), five items relating to perceived meaningfulness of dreams formed the meaningfulness subscale (MADRE Items 12a, 12c, 12e, 12g, 12h), and three items comprised the creative or problem-solving dreams subscale (MADRE Items 16, 17). Definitions for nightmares, lucid dreams, precognitive dreams, OBEs, and sleep paralysis were provided next to the relevant questions to ensure participants understood the experience similarly.

Participants who reported having experienced a near-death event completed all items, including the demographic questions, near-death event-related questions, the

Table 1
Dream Variables

Variable	Question	Scale
Recall	“How often have you recalled your dreams recently (in the past several months)?”	0 = <i>never</i> , 7 = <i>almost every morning</i>
Emotional intensity	“How intense are your dreams emotionally?”	0 = <i>not at all intense</i> , 5 = <i>very intense</i>
Emotional tone	“What is the emotional tone of your dreams on average?”	0 = <i>very negative</i> , 5 = <i>very positive</i>
Nightmares	“How often have you experienced nightmares recently (in the past several months)?”	0 = <i>never</i> , 8 = <i>several times a week</i>
Childhood nightmares	“How often did you experience nightmares during your childhood (from 6 to 12 years of age)?”	0 = <i>never</i> , 8 = <i>several times a week</i>
Lucid dreams	“How often do you experience so-called lucid dreams?”	0 = <i>never</i> , 8 = <i>several times a week</i>
Precognitive dreams	“How often do you experience precognitive dreams?”	0 = <i>never</i> , 8 = <i>several times a week</i>
Sleep paralysis	“How often do you experience sleep paralysis?”	0 = <i>never</i> , 8 = <i>several times a week</i>
Out-of-body experiences	“How often do you experience an out-of-body experience while sleeping or dreaming?”	0 = <i>never</i> , 8 = <i>several times a week</i>
Creative/problem-solving dreams (2 × items)	For example, “How often do your dreams help you to identify and solve your problems?”	0 = <i>never</i> , 8 = <i>several times a week</i>
Meaningfulness (5 × items)	For example, “How much meaning do you attribute to your dreams?”	0 = <i>not at all</i> , 5 = <i>totally</i>
Interest (3 × items)	For example, “I think that dreaming is in general a very interesting phenomenon”	0 = <i>not at all</i> , 5 = <i>totally</i>

Note. Adapted from “The Mannheim Dream Questionnaire (MADRE): Retest Reliability, Age and Gender Effects,” by M. Schredl, S. Berres, A. Klingauf, S. Schellhaas, and A. S. Göritz, 2014, *International Journal of Dream Research*, 7(2), pp. 141–147 (<https://doi.org/10.11588/ijodr.2014.2.16675>). Open access.

NDE Scale, IES-R, and dreaming items. Those who did not indicate having had a near-death event completed the demographic items and the dreaming items.

Data Analysis

SPSS Version 28.0.1.1 for Windows was utilized for data analysis. To examine differences in scores for key variables across the groups, independent samples *t* tests and analysis of variance (ANOVA) were used. Pearson’s correlation tests were conducted to examine correlations between measures. Standard linear regressions were calculated to analyze the effect of different predictors on dream experience frequency, namely trauma symptoms, NDE phenomenology, and potential confounds like gender and interest in dreams. The variables were entered simultaneously. For all analyses, a significance level of $p < .05$ was set, and Cohen’s (2013) guidelines were used to interpret effect sizes.

Results

Near-Death Phenomenology

The NDE Scale showed excellent internal consistency (Cronbach’s $\alpha = .88$). Total scores for the 183 participants who reported coming close to death ranged

from 0 to 31, with a mean score of 13.26 ($SD = 7.89$). Participants whose scores met the criterion of 7 or higher (NDE group) had total scores ranging from 7 to 31 with a mean score of 16.50 ($SD = 6.17$).

ANOVAs revealed significant differences in NDE Scale scores according to proximity to death, $F(2, 180) = 9.30, p < .001$, with those who reported being physically dead during their near-death episode ($n = 43$) evidencing the highest mean scores ($M = 15.88, SD = 6.43$). A significant positive correlation was observed between age and the NDE Scale scores ($r = .29, p < .001$). No differences according to gender, ethnicity, level of education, marital status, and presence of a medical condition were observed. Pearson's correlation coefficients also found no significant correlation between NDE Scale scores and years elapsed since the NDE.

Posttraumatic Stress Symptoms

The IES-R demonstrated excellent internal reliability ($\alpha = .94$). The mean total score on the IES-R for NDE group ($M = 27.05, SD = 20.69$) was significantly higher than that of the non-NDE group ($M = 19.37, SD = 13.85$), $t(112) = 2.82, p = .006$. Time elapsed since the near-death event was significantly negatively correlated with IES-R scores for the NDE group ($r = -.403, p < .001$) and non-NDE group ($r = -.399, p = .01$), suggesting the more recent the event, the higher the score on the IES-R. Pearson's correlation coefficients also found a significant negative correlation between IES-R scores and age ($r = -.22, p = .02$), with younger participants reporting more trauma symptoms. No other differences were observed.

Dream Experiences and Attitudes

Table 2 presents the results of ANOVAs indicating significant differences across participants categorized by NDE status for nearly all the dreaming variables. Tukey post hoc tests showed that the NDE group recalled their dreams more frequently ($p < .001$) and had more intense dreams ($p < .001$) than controls. In the NDE group, 26% recalled their dreams every morning compared to 13.3% of the non-NDE group and 10% of the control group. Although the NDE group reported more positive dreams than others, no significant differences in overall emotional tone were apparent. Nightmares were experienced significantly more often by the NDE group ($p = .008$) compared to the control group, with small effect. No differences between non-NDE and NDEs were noted at the post hoc level.

The frequency of lucid dreams, precognitive dreams, and OBEs experienced during sleep differed significantly across groups. Tukey post hoc tests revealed the NDE group reported more of these experiences than both non-NDE and control groups ($p < .001$); both lucid and precognitive dreams with large effect and OBEs with medium effect. No significant differences between groups were found for frequency of sleep paralysis or childhood nightmares.

There was a significant positive correlation between the NDE Scale and frequency of lucid dreams ($r = .38, p < .001$), precognitive dreams ($r = .29, p < .001$), and OBEs ($r = .38, p < .001$). For the NDE group, no correlations were observed across any of the sleep variables with regard to proximity to death, time elapsed since the NDE, or presence of a medical condition.

Table 2
Mean Scores and ANOVAs for Dream Variables According to NDE, Non-NDE, and Control Groups

Dream variable	Total	NDE	Non-NDE	Control	ANOVA	η^2
	<i>M (SD)</i> (<i>n</i> = 312)	<i>M (SD)</i> (<i>n</i> = 138)	<i>M (SD)</i> (<i>n</i> = 45)	<i>M (SD)</i> (<i>n</i> = 129)		
Dream recall	3.52 (1.85)	3.98 (1.81)	3.33 (1.89)	3.09 (1.78)	$F(2, 309) = 8.37^{***}$	.05
Emotional intensity	2.15 (1.37)	2.56 (1.48)	2.04 (1.42)	1.75 (1.08)	$F(2, 309) = 12.56^{***}$	.08
Emotional tone	1.82 (0.93)	1.92 (1.05)	1.53 (0.84)	1.82 (0.80)	$F(2, 309) = 2.94$	.02
Nightmares	2.73 (2.03)	3.07 (2.11)	2.80 (2.17)	2.33 (1.82)	$F(2, 309) = 4.54^*$	.03
Childhood nightmares	3.17 (2.22)	3.31 (2.42)	3.22 (1.94)	3.00 (2.10)	$F(2, 304) = 0.63$	.00
Precognitive dreams	1.35 (1.67)	2.11 (1.88)	0.93 (1.49)	0.69 (1.07)	$F(2, 301) = 29.71^{***}$	.17
Sleep paralysis	1.03 (1.43)	1.16 (1.51)	0.84 (1.14)	0.95 (1.44)	$F(2, 303) = 1.07$	.01
Out-of-body experiences	1.07 (1.62)	1.74 (1.90)	0.49 (0.78)	0.58 (1.22)	$F(2, 279) = 22.63^{***}$	.13
Creative/problem-solving dreams	1.82 (2.10)	2.46 (2.36)	1.30 (1.73)	1.34 (1.72)	$F(2, 301) = 11.60^{***}$	.10
Perceived meaningfulness	1.70 (1.98)	2.41 (2.25)	0.93 (1.56)	1.22 (1.53)	$F(2, 301) = 17.10^{***}$	.10
Interest in dreams	8.34 (2.99)	8.87 (2.86)	7.75 (2.89)	8.00 (3.08)	$F(2, 305) = 3.90^*$	.03

Note. ANOVAs = analyses of variance; NDE = near-death experience.

* $p < .05$. *** $p < .001$.

Attitudes to Dreams

Items pertaining to the perceived meaningfulness of dreams differed across the groups, with medium effect. A Tukey post hoc test revealed that scores on this subscale were significantly higher for the NDE group ($p < .001$) than the non-NDE and control groups, indicating that they ascribed more meaning to their dreams. Interest in dreams significantly differed across the groups, with a small effect. Scores on the interest in dreams subscale were marginally but significantly higher for the NDE group than the control group ($p = .45$). The use of dreams for creative or problem-solving purposes was also significantly higher in the NDE group compared to non-NDE and controls ($p < .001$).

There was a significant positive correlation between the NDE Scale and use of dreams for creative/problem solving ($r = .40$, $p < .001$), interest in dreams ($r = .20$, $p = .007$), and perceived meaningfulness ($r = .40$, $p < .001$).

Significant positive relationships were observed between the IES-R and dream emotional intensity ($r = .30$, $p < .001$), nightmares ($r = .32$, $p < .001$), sleep paralysis ($r = .24$, $p < .001$), lucid dreams ($r = .17$, $p = .02$), and meaningfulness ($r = .17$, $p = .02$).

Regression Analyses

For nightmares, results of the multiple linear regression indicated that there was a collective significant effect between the IES-R, NDE scale, gender, age, and dream recall frequency, $F(5, 178) = 19.85$, $p < .001$, $R^2 = .35$. The individual predictors were examined further and indicated that total IES-R scores ($b = 0.31$, $t = 4.44$, $p = .000$) and dream recall ($b = 0.55$, $t = 7.56$, $p < .001$) were significant predictors in the model. For lucid dreams, there was a combined significant effect between IES-R, NDE Scale, gender, recall, and interest, $F(5, 174) = 9.45$, $p < .001$, $R^2 = .22$.

The individual predictors were examined further and indicated that NDE scale scores ($b = 0.90, t = 4.50, p < .001$) and recall ($b = 0.27, t = 2.97, p = .003$) were significant predictors in the model. There was a significant combined effect for IES-R, NDE Scale, gender, age, and interest in dreams for the precognitive dreams model, $F(6, 171) = 4.28, p < .001, R^2 = .11$. Interest in dreams ($b = 0.11, t = 2.25, p = .03$) and NDE Scale scores ($b = 0.06, t = 2.89, p = .004$) were significant predictors. Finally, for OBEs experienced during sleep, the results indicated a collective significant effect between the IES-R, NDE Scale, gender, age, and interest, $F(5, 170) = 8.44, p < .001, R^2 = .20$. The individual predictors were examined further and indicated that age ($b = 0.30, t = 3.15, p = .002$) and NDE Scale ($b = 0.05, t = 3.31, p < .001$) were significant predictor variables in the model.

Discussion

Findings indicated significant differences with large effects between groups for the majority of dream variables measured in this study. Overall, the NDE group reported greater dream recall, more emotionally intense dreams, and more nightmares than controls. The NDE group also reported a higher frequency of lucid dreams, precognitive dreams, and OBEs compared to both non-NDE and control groups. The NDE group also exhibited more positive attitudes to dreaming than other groups, with greater interest, perceived meaningfulness, and higher use of dreams for creativity and problem-solving purposes.

Traumatic experiences are frequently linked to poorer sleep quality, higher frequency of nightmares, sleep paralysis, vivid and lucid dreams, OBEs, and potentially precognitive dreams (e.g., Aviram & Soffer-Dudek, 2018; Giannakopoulos & Kolaitis, 2021; Valášek & Watt, 2015). However, several indicators suggest increased prevalence of atypical dream states among the NDE group in this study were primarily associated with the NDE, rather than the event of coming close to death. Firstly, regression analyses revealed NDE scores rather than IES-R scores were a significant predictor of lucid dreams, precognitive dreams, and OBEs. Secondly, correlations indicated a positive relationship whereby “deeper” or more intense NDEs (the presence of more phenomenological features) were associated with higher frequency of lucid dreams, precognitive dreams, and OBEs. Thirdly, while IES-R scores were significantly higher in the NDE group compared to the non-NDE group, analyses revealed differences only on the intrusion subscale (intrusive thoughts, nightmares, intrusive feelings and imagery, dissociative-like reexperiencing). While intrusive thoughts and feelings can be distressing for many trauma survivors, it is possible those who have NDEs interpret intrusive symptoms differently from others (Greyson, 2001; Lindsay & Tassell-Matamua, 2020). Reexperiencing aspects of an NDE may not necessarily be upsetting, particularly if the conscious experience was pleasant in tone and/or interpreted as a profound spiritual event. Similar to findings by Greyson (2001), the NDE group did not appear to make greater efforts to avoid intrusive thoughts, as avoidance subscale scores were equivalent to that of the non-NDE group. Taken together, these findings strongly suggest many of the dream experiences reported by individuals who have had NDEs, particularly those involving clear and structured mentation with a high level of agency, are primarily related to the subjective experience of the NDE rather than the trauma of coming close to death.

Interestingly, nightmares also occurred more frequently among the NDE group, albeit with small effect. However, in this case, IES-R scores rather than NDE Scale scores were the most significant predictor variable, suggesting these types of dream anomalies may have a different causal basis than lucid dreams, OBEs, and precognitive dreams, and perhaps relate more to the traumatic aspects of the experience rather than the NDE. Somewhat paradoxically, the overall emotional tone of dreams experienced by the NDE group was more positive than other groups, which seems contradictory considering they reportedly experienced more nightmares. However, given the NDE group demonstrated higher dream recall compared to other groups, and recall was a significant predictor of nightmare frequency, it is also possible the NDE group simply remembered more nightmares rather than experienced them more often.

Perhaps surprisingly, sleep paralysis did not occur more often among the NDE group, despite its common association with stress or trauma (Aviram & Soffer-Dudek, 2018). However, a positive correlation between IES-R scores and sleep paralysis frequency was observed among the joint sample of near-death survivors in this study. This suggests a causal relationship between the two variables, in keeping with prior research, but may indicate that NDEs somehow inoculate the individual from experiences of sleep paralysis. It may also tentatively suggest that sleep paralysis can be differentiated from other atypical modes of dreaming, such as OBEs and lucid dreaming, despite speculation the phenomena are connected in some manner (Raduga et al., 2020). Numerous typical and atypical sleep/dreaming states occur during the REM phase of sleep. For example, sleep paralysis is considered a REM state parasomnia. OBEs are often experienced in conjunction with sleep paralysis (Levitan et al., 1999; Nelson, et al., 2007), with individuals who experience sleep paralysis approximately 44% more likely to report OBEs compared to individuals who have never encountered sleep paralysis (Levitan et al., 1999). Likewise, lucid dreaming is considered a highly activated REM state that shares phenomenological characteristics with OBEs (Holzinger & Mayer, 2020; Yu & Shen, 2020). Although it is currently unclear whether the above phenomena are physiologically correlated, it is important to note that both nightmares and sleep paralysis in this study were better predicted by IES-R scores rather than other factors, suggesting distressing dream experiences with intensified negative affect may have a different etiological basis.

While clear links between NDEs and certain modes of dreaming were apparent in this study, issues of causal direction must be considered. One explanation is those who have NDEs may be predisposed to altered states in general, including NDEs, OBEs, lucid dreams, and other dissociative states like REM intrusion during wakefulness, presumably through a preexisting neurological configuration. Several authors have suggested overlap between NDE features and those experienced during other altered states indicates a shared physiological basis for these experiences, potentially offering causal explanations for the occurrence of NDEs (Romand & Ehret, 2023). In the current study, while we did not and could not assess dream characteristics prior to the NDE, some of the dreaming questionnaire items may provide further insight. For example, the frequency of childhood nightmares was assessed to gather information about the individual's dream history, which can be relevant in understanding their overall dream patterns and experiences (Schredl et al., 2014). To this end, no differences were found between groups, suggesting some level of equivalence (in terms of nightmares at least) in the

participants' developmental history. It must also be acknowledged that participants in prior studies have stated these changes as occurring only after the NDE (Greyson, 1983b, 2001; Kohr, 1983; Lindsay & Tassell-Matamua, 2020; Ring & Rosing, 1990; Sutherland, 1988).

Alternatively, increased propensity to expanded states of consciousness, including sleep-related, may occur as a direct result of the NDE—whether physiological or psychological in origin. From a psychological perspective, certain characteristics of the experience might result in expanded awareness more generally. For example, when individuals encounter experiences of consciousness that appear to defy conventional explanations, they may become more interested and open to other expanded forms of consciousness, including those that occur during sleep. Resultantly, those who have had NDEs may become more attuned to their dreams, more capable of recognizing when they are dreaming (i.e., lucid dreaming), and more likely to search for deeper meanings in them. Previous research has demonstrated that interest in dreaming typically facilitates greater recall and engagement with dream content, which may include the deliberate incubation of problem-solving dreams, lucid dreams, and OBEs (Pagel & Kwiatkowski, 2003). However, this explanation is tempered by results of the regression analyses which revealed that “interest” was not a significant predictor of lucid dreams or OBEs among near-death survivors. Although interest was a significant predictor of precognitive dreams, the direction of this relationship is unclear. Presumably, precognitive dreams that are later verified by real-life events may naturally increase interest in one's dreams, rather than the other way around.

Atypical dreaming may also be linked to neurostructural changes, such as altered REM functioning that occurs because of the NDE rather than predates it. These alterations may influence how individuals process dream content, leading to more vivid or unusual dream experiences. Of particular relevance, other nonordinary states of consciousness not precipitated by traumatic episodes have also been associated with unusual dream states, such as more vivid, lucid, and precognitive dreams (Gackenbach, 1990; Gackenbach et al., 1986; Rabeyron & Loose, 2015). Experienced meditators are more likely to experience lucid dreams, with positive correlations between years of practice and number of lucid dreams (Baird et al., 2018; Hunt & Ogilvie, 1988; Stumbrys et al., 2015). Advanced meditation techniques, which give rise to mystical or peak experiences such as the experience of “oneness,” a state bearing remarkable similarities to the NDE feature of “unitive consciousness” can facilitate permanent changes in electrophysiological oscillation patterns, with practitioners evidencing higher theta and gamma brainwave activity during nonmeditative as well as meditative states (Aftanas & Golosheykin, 2005; Lutz et al., 2004). Meditation studies have also demonstrated increased connectivity between various brain networks (Guidotti et al., 2021), a finding also observed among lucid dreamers (Baird et al., 2018), which may play a role in the ability to maintain self-awareness during dream states. Future research using electroencephalogram and brain imaging is recommended to determine whether the baseline states of those who have had NDEs approximate the neuroplastic changes observed in other practitioners of expanded consciousness. If similar changes are observed, the possibility of structural shifts occurring in response to NDEs warrants greater consideration. It may be that depth of experience (i.e., more radical shifts in conscious alteration) is equally important as duration and accrued length of exposure to expanded conscious states.

Limitations

The results of this study were derived from a self-selected, nonclinical convenience sample. Given the research was advertised as a sleep and dreaming study, it is quite possible that only those with an interest in dreaming took part, overinflating frequency estimates of dream experiences and attitudes. Equally, certain types of NDE participants may have been more likely to take part, for example, only those who felt they had been altered by their NDE. By contrast, those who did not consider their NDE to be a significant or transformative experience may have had less motivation and interest in completing the survey. More women than men participated. As prior research has demonstrated, women are more likely to report nightmares, vivid dreams, lucid dreams, and higher recall and interest (Gackenbach, 1990). While our analyses did account for potential gender effects as well as interest in dreams, generalizing the results of the survey to the wider population of NDE survivors needs to be approached with caution. Future research using larger, more representative but also more diverse samples, is recommended.

Although our data strongly suggest changes in the NDE group do not primarily stem from PTSD, we cannot rule out this possibly, especially given trauma symptoms were significantly higher in this group. As previously mentioned, analyses revealed differences on the intrusion subscale only of the IES-R, and it is possible that those who have NDEs may interpret intrusive symptoms differently than others (Greyson, 2001; Lindsay & Tassell-Matamua, 2020); for NDE survivors these symptoms may not be particularly upsetting. However, this is speculative only and clinical assessment and follow-up interviews with NDE participants to determine whether the NDE was sufficiently distressing, as IES-R scores would indicate, is recommended for future research in this area.

Conclusion

The present study examined the association between NDEs, trauma, and dreaming, finding those who experienced NDEs were significantly more likely to report unusual dream experiences, especially lucid dreams, precognitive dreams, and OBEs. These states share clear similarities with NDEs—that is, they typically consist of clear, vivid, and coherent narrative structures devoid of the bizarre, fragmented imagery often characterizing ordinary dreams. Instead, these types of experiences appear to involve higher-order cognitive functions that include heightened self-awareness and self-regulation not normally available during ordinary dreaming (Lin & Xiao, 2022; Marsh, 2021). Our findings continue to suggest a relationship between nonordinary states and expanded awareness more broadly—whether experienced during sleep, wakefulness, or somewhere in between. It is plausible that alterations in brain structure and functionality may not only arise from intentional, sustained activities such as long-term meditative practice. NDEs, a unique state of consciousness sometimes appearing to span only seconds in objective time, may also result in neurophysiological transformation. Future research examining baseline brain states in those who have experienced NDEs is recommended.

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