

Nursing Practice Today

2023; Volume 10, No 2, pp. 147-155



Original Article

Near-death experience: A concept analysis

Azeem Kaleem

DAKSON Institute of Health Sciences, Dr. Saeed Akhtar College of Nursing, Islamabad, Pakistan

ARTICLE INFO	ABSTRACT
Received 23 February 2023 Accepted 26 April 2023	Background & Aim: The incidence of near-death experience is not a novel phenomenon since human history. However, with healthcare technological advancement, near-death narratives have been reported in a greater number of critically ill patients as well as in the
Available online at: http://npt.tums.ac.ir	general community. Therefore, healthcare professionals must recognize the concept of near-death experiences and provide relevant care to their patients. Unfortunately, healthcare providers, especially nurses, do not have sufficient knowledge regarding near- death experiences, hence, to clarify the concept and its importance for better patient-care
Keywords: near-death experience; concept analysis; nursing	 death experiences, hence, to charry the concept and its importance for better patient-care outcomes via this concept analysis. Methods & Materials: The understanding of the near-death phenomenon is employed through the framework of Walker and Avant's concept analysis. The study familiarizes the concept via its definition, origin, significance, characteristics, antecedents, and consequences of near-death experiences. This was achieved after deeper exploration and analysis of the concept through an extensive literature search. Furthermore, multiple cases
Corresponding Author: Azeem Kaleem, DAKSON Institute of Health Sciences, Dr. Saeed Akhtar College of Nursing, Islamabad, Pakistan. E-mail: kaleemazeem1993@gmail.com	are provided as exemplars to recognize the concept. Results: Near-death experience is defined as a profound conscious experience encountered by the individual. The characteristics of near-death experiences are based on cognitive, affective, paranormal, and transcendental components. Following the experience, the individuals undergo a transformational change in their lives. However, individuals with near-death experiences require facilitation and support from healthcare workers, especially nurses, for the early integration of near-death experiences.
DOI: 10.18502/npt.v10i2.12835	Conclusion: The understanding of the concept of near-death experience enables nurses to provide relevant nursing interventions. Such interventions promote positive well-being in the individuals' lives through their near-death experiences.

Introduction

Science contains limited knowledge about cognitive processing during the dying state (1,2). On the other hand, an elevated state of consciousness is also reported during nearto-die conditions (3). This period of elevated consciousness seeks an explanation as opposed to a naturalistic paradigm (1). Evidently, a study suggests that out of 10% to 20% of clinical deaths, 1% of the rescued individuals share a narrative of witnessing a non-physical dimension (4). Such narratives are commonly conceptualized as near-death experience (NDE). NDE, described as an altered state of consciousness (ASC), questions the cognitive of mind and is marked as state а

pathophysiological state despite its insightful and positive outcomes (1,5,6). In addition, NDE is also reported as a deep emotional memory indicating its exceptional nature and not merely an altered state of mind (3).

Reports of near-death experiences (NDEs) have been increased due to improved survival rates through technological advancement (7). It is reported in an analysis of nine prospective studies, an average rate of NDEs as 17% (8). Supported by another study suggesting NDE reports as 22% (9). A European study revealed 18.9% out of 37 survivors of cardiac arrest confirmed NDE (7).

Please cite this article as: Kaleem A. Near-death experience: A concept analysis. Nursing Practice Today. 2023; 10(2):147-155

Copyright © 2023 Tehran University of Medical Sciences. Published by Tehran University of Medical Sciences. This work is licensed under a Creative Commons Attribution-Noncommercial 4.0 International license (https:/creativecommons.org/licenses/by-nc/4.0/) Noncommercial uses of the work are permitted, provided the original work is properly Cited Additionally, a report addressed 35% of the casualties encountered by NDE (10).

Furthermore, a study describes NDE as a distinctive recollection, an incomparable experience, and a life-transformational event (11). This transformation is followed by exposure to unknown realities which makes the individual vulnerable to distress and challenges after coming back to the physical world (12,13). Moreover, when these realities are shared with healthcare professionals, the individuals face ignorance of the healthcare workers due to their limited knowledge and perspectives in terms of its definition, features, and aftereffects, as reported by earlier studies. Eventually, the individuals are misdiagnosed and treated in the domain of psychotic disorders (3,7,26,27). Likewise, nursing personnel, being the first responders to the patients with NDE, equalize near-death experiences with delirium or psychosis (14), assumingly leading to futile treatment of the patients. This ultimately leads the patients to experience shock, depression, and psychological distress (5,14,28). Hence, a need to clarify the concept with respect to its definition, features, and aftereffects through this concept analysis. However, if the nursing personnel have sufficient knowledge regarding the phenomenon, potential support brings positive outcomes into the lives of the patients with NDE (6,7,12,14,26,27).

Methods

The study intended to analyze and clarify the concept of near-death experience using the analytical approach of Walker and Avant's framework of concept analysis. This framework is systematic and practical. The framework helps in the thorough understanding of the concept in terms of its definitions, attributes, antecedents, consequences, and various model cases (15). To elaborate, the framework includes eight steps. The first two steps involve the definition and origin of the concept analysis based on the identified research problem. The third step includes the significance of the concept in relation to its practical implications. Furthermore, defining the attributes/ characteristics of the concept is the fourth step. This leads to the antecedents or the causes of the occurrence of the concept. The sixth step entails the possible aftereffects termed as consequences of the concept. In addition, various case studies are discussed in the seventh step, i.e., model case, borderline care, and contrary case. The last step includes defining the empirical referents of the concept (15).

Search strategy

Databases of PubMed, google scholar, and PsychInfo were searched for the literature review of near-death experience using the terms "NDE" and "Near-death Experience" with AND, OR boolean operators. PubMed, google scholar and PsychoInfo identified 83, 173, and 32 articles, respectively. These articles were identified while keeping the search restricted from 2002 to 2022. The restriction of the years was based on the consideration of the earlier concept analysis publication (16). With the exclusion of duplicate articles, abstract access only, irrelevance, and dissertations, 24 articles were included in the concept analysis. These selected articles provide a thorough understanding of the attributes, antecedents, and consequences of the concept of near-death experiences. Seminal works were also included as a necessity for the preliminary cognizance of the concept. Conventionally, Meriam-Webster Medical Dictionary and Cambridge Online Dictionary were used to define the concept of near-death experience.

Results

Near-death experience

Definition

Attributes/Characteristics particular to the concept constitute the definition of a concept (15). The concept of near-death experience is comprised of three words, i.e., near, death, and experience.

According to Meriam Webster's Dictionary, near is defined as "close to" and "not far distant in time, place, or degree" (17), supported by the Cambridge Dictionary (18). All-inclusive, near is proximity to something or someone.

The Cambridge dictionary defines the term death as "end of life" (19), while Meriam Webster dictionary represents death as "cessation of vital signs/ an instance of dying" (20). All these definitions accommodate the concept of mechanistic representation of dying, which defines death as the halting of physiology (21). Hence, from the abovementioned definitions, death can be portrayed as the ultimate termination of anything which has the potential to live.

Cambridge dictionary phrases experience as "Acquisition of knowledge from doing, seeing or feeling things" (22). Meriam Webster dictionary adds to the definition by phrasing "something personally encountered, undergone or lived through" or "the conscious events that make up an individual life" (23). Consequently, experience is a subjective reality that ascends to human behavior and thought processes. Near-death elucidates an individual experience of death occurrence (6).

Meriam Webster and Cambridge dictionaries contribute to the definition of the concept of near-death experience respectively, "an occurrence in which a person comes very close to dying and has memories of a spiritual experience (such as meeting dead friends and family members or seeing a white light) during the time when death was near" (24) and "an experience described by some people who have been close to death, in which the person feels as if they have left their body and are watching themselves from above" (25).

However, these definitions are inadequate to define the whole of the concept rather than describe one or two of the features of the NDE phenomenon. On the other hand, numerous researchers have defined NDE based on the features encountered during the phenomenon (1,5,6,11,13,26,34). The wellestablished definition of near-death experience is described by Greyson (1983) as a profound conscious experience and is a collection of cognitive, affective, paranormal, and transcendental features (35).

Origin of the concept

Plato, an ancient Greek philosopher, believed that ultimate truth brings intuition and awareness. Plato equalizes birth to slumber and death to a mysterious recollection. Similarly, Athens was a powerful civilization in ancient Greece (428-348 BC) that believed that flesh is a vessel to the soul, which escaped like a puff of wind at the time of death. Tibetan Book of the Dead, written in the 18th century, considered bodily stages of death and dying and articulated the achievement of spiritual liberation at the moment of death (6). Conclusively, the notion of a non-ordinary experience of death and dying is primitive, but it was publicized not long ago when Raymond Moody coined the term 'Near Death Experience' in 1975 in his book 'Life after Life,' covering 150 instances about participants' experiences of claiming an unknown existence to the physical world and explained NDE as a recollection of a strong emotional and psychospiritual span of inklings (1-3).

Another study equalizes the description of NDE with flashbulb memory which is defined as an extremely emotional and significant episode of reality (11).

Significance of the concept

The occurrence of NDE is not bound to culture, color, or faith (15); however, the essence and the context of NDE are influenced by an individual's religious and societal involvement, as reported in a study (26).

Near-death experiences undergo substantial psychosocial crises following the event. The individuals seek its interpretation primarily from health care personnel. Despite NDE being real-life memory to the patients, numerous studies have explicated a dire lack in healthcare facilities regarding the recognition of NDE (1,5,8,26,30). A study insinuated that one in five experiences of NDE feels anguish on disclosing NDE to the health care provider (27). This behavior of health care providers is possibly explained by the mere accreditation on empirical evidence and objectivity, pronouncing this concept as pathological (1,3,12,16).

Nonetheless, this concept cannot be ignored. Its significance needs to be computed in the spheres of practice and spirituality. The attributes, antecedents, and consequences of the concept of near-death experience are illustrated in Tables 2,3 & 4.

Attributes

Attributes are the characteristics that are necessary for the concept (15). To elaborate, attributes are the manifestations of the phenomenon. According to numerous studies, NDE is manifested in the following stages, i.e., feeling of peacefulness, silence, noise, walking through a pitch-dark tunnel, dissociating from the physical body, encountering luminous light, reviewing past events, reconciling with deceased relatives or God/angels/saints, confronting a boundary of limit (negotiation with relatives/God to stay in or go back), and regaining the physicality (1,2,3,5,7,9,11,12,26,28,33).

However, few researchers disagreed with the sequential phases of NDE, suggesting there are no instances of similar NDEs, and each NDE is perceived to be solitary in nature (10,11,15).

Common attributes experienced by individuals are feeling of bright light (seeing a white/blue light which is comforting and pulling towards its very origin), reuniting with loved ones or mystical beings (a point of re-meeting with the demised relatives or righteous beings like Jesus), perceiving oneself out of the physical body (a sense of pulling against the gravity and visualizing oneself from a distance – a paranormal state) and appreciating affirmation with peacefulness and extreme comfort (positive feelings about everything around) (12,29).

Very few studies have reported NDE as a tormenting experience like hell fire (inferno and demons), the fright of the light (an uneasiness to dissolve into the white light), and confrontation of sole darkness instead of light (2,13). To conclude, the attributes of near-death experiences can be classified into cognitive, affective, supernatural, and paranormal characteristics (35) (Summarized in Table 2).

Table 2. Autodes of hear-dead experience		
Element	Attribute	
Cognitive	Heightened awareness (sounds, voices), altered time perception, review of life/past events, moving through a tunnel	
Affective	The feeling of peace, joy, being united with the universe, seeing a soothing/distressing bright light	
Supernatural	Extra-sensory perception, precognition or insight, out-of-body experience	
Transcendental	Witnessing another dimension of the world, seeing mystical/spiritual beings (angels, demons, saints), meeting with deceased relatives, witnessing a dead-end	

Table 2. Attributes of near-death experience

Principally, NDE is an internalized feeling of consciousness, and it is difficult to verify the experience through external validation (30). Nonetheless, numerous prospective studies conducted over time aimed to ensure the validity of NDE memory in terms of its subtle and varying details over a

period of time or through neuroscientific techniques by recruiting NDE participants and found no significant difference (3,11). On the whole, empirical evidence is inadequate to rule out the occurrence of the concept exclusively on psycho-physiological aspects (1).

Antecedents

Determinants which are facilitating the development of a concept are called antecedents (15). There are no set criteria for the occurrences of NDE. Cardiac arrest and even perception of potential death threats leading to psychological dissociation have been reported to be the cause of NDE (1,3,9,12). Moreover, déjà vu and yoga are the predisposing factors to trigger NDE (5,28). Dreams (Rapid eye movement) and comatose condition are evident antecedents of NDE. In severe kidney pathology, typically, patients on hemodialysis are thought to be at risk of experiencing multiple **NDEs** (31,32). Children, as well as blind people, have reported NDE (2). NDE induction in the period of role transition (Divorced cases) and even non-life-threatening circumstances have

also been reported as antecedents of neardeath experiences and termed NDE-like experiences. (1,16).

A study delineated epileptic seizures to be the antecedent of near-death experiences (34). Few studies proposed NDE reports in near drowning, near road traffic accidents, suicide patients. attempted cerebral traumatization, electrocution (burns), and stroke (2,3). Electrochemical imbalances are induce also theorized to near-death experiences (1,29).

Despite neurobiological and psychological explanations regarding NDE features, science has not yet explained a single trigger causing the NDE features as a whole. However, it can be suggested that near-death experience is elicited in both life-threatening as well as non-life-threatening conditions (Summarized in Table 3).

Table 3. Antecedents of near-death experience

Antecedents	
Life-threatening	Cardiac arrest, severe kidney pathology, hemodialysis, epilepsy, near-drowning, road traffic accidents, suicide, cerebral traumatization, electrocution, stroke
Non-life-threatening	Déjà vu, yoga, dreams (rapid eye movement), comatose condition, divorce, electrochemical imbalance, potential death threat/panic

Consequences

Unit outcomes are called consequences of the concept (15). NDE is a crucial lifetransforming event (7). A near-death experience is a reality that brings meaning to individuals' lives (12). However, individuals with NDE perceive a cultural shock when they revert back to the physical world (16).

Positive consequences of NDE include a dramatic change in psychological functioning (heightened self-esteem, appreciation of the present, adherence to effective coping mechanisms, and no grandiosity), social life (forbearance towards others, involvement in social justice, counseling, less materialism), perception of spirituality (sense of tranquility) and religion (alteration in the concept of the afterlife) and intra- psychic development (increased self-awareness and intuition). Knowledge acquisition and diminished fear of death are also the consequences of NDE (6,7,11,12).

Negative consequences are supposedly the manifestation of societal unacceptance towards individuals with NDE. Confliction, uncertainty, anguish, and desolation precede depression. Isolation, unemployment, relationship breakups, increased divorce rates, and making sense of reality eventually lead to disrupting the personality of NDE individuals (28). Interestingly, distressing NDE (hellish creatures and darkness) settle over time with therapy as well (13). The consequences of NDE are summarized in Table 4.

Near-death experience

Consequences	
Positive	Heightened self-esteem, appreciation of the present, adherence to effective coping mechanisms, humility, forbearance towards others, social justice, altruism, self-actualization
Negative (if individual with NDE is judged and not accepted by society)	Confliction, uncertainty, anguish, desolation, depression, frequent job quits, increased divorce rates, disruptive personality behaviors

Cases

A model case constitutes all the critical attributes of the concept (15). All characters in the following cases are fictitious.

Model case

Mr. Aaron, a 54 years old man admitted to the emergency department with a complaint of chest pain (8/10). Acute coronary syndrome protocol was given immediately, and pain settled to 4/10 on a pain scale.

He is vitally stable when all of a sudden, Aaron becomes unconscious, and his heart beats 215 per minute, and his rhythm shows ventricular fibrillation on the monitor. The nurse announces the code, and the team successively reverts the patient. After a few days, the nurse pays him a visit. He greets her and shares a story that he was not actually unconscious when they were intubating him. He saw a bright light, and then he viewed his life events like a movie when he was on his way to a dark tunnel, and he met his deceased father, who forced him to go back. Afterward, he saw his body from the ceiling, and in no time, he fell back to his body.

Related case

A related case lacks the critical attributes of the concept with the inclusion of non-defining characteristics.

Mr. Sean, a 35 years old male, who works as an assistant manager in a multinational company, is driving back home. On his way home, a dog, out of nowhere, runs towards his car, and he suddenly steers the wheel when his car starts drifting, and he experiences a still of the moment. He could feel it every second, and he thought about his past, how he grew up in a slum having a single parent who had beaten him all his life, and how he ran off to this new city and started a business with a few pennies in his pocket. He visualizes his wife and children and how rude he had been to them; these couple of months. In the meantime, his car unexpectedly hits the sidewalk when airbags save his head from trauma while he blacks out.

In this case, Mr. Sean encounters a potential death threat from a road traffic accident, but critical characteristics of the concept cannot be observed except for life review.

Contrary case

Attributes of the concept are not present in the contrary case. Miss Samantha works as an employee in a chemical factory. She is a hard-working employee. One evening, when she is working overtime in her office. She hears a strange noise from the outside. She goes out and gets panic to see a blew-up pipe. Bravely, she attends the fire alarm and turns it on so other employees get notified. She takes her belongings and goes on her way out of the factory; in between, the factory sets on fire, and Miss. Samantha loses her senses due to smoke intoxication.

Fortunately, the rescuers came and took her out to the safe zone while she was unconscious. Miss Samantha is vitally stable (Blood Pressure: 110/80mmHg, Heart rate: 67 beats/min, Respiratory rate, and 13 breaths/min). After gaining consciousness, she was asked if she could remember anything, and she replied with nothing but the fire. In this case scenario, we can find Miss. Samantha is in a close brush to death (an antecedent of the concept), but no single attribute can be extracted from the given model.

Empirical referents of the concept

The scale to operationalize the concept is called empirical referent (15). Numerous scales have been invented to measure near-death experiences. However, the most commonly used scales are Ring's *Weighted Core Experience Index* to study the depth of NDE. In addition, Greyson's *Near-Death Experience Scale* is also utilized in research studies (33,35).

Discussion

The near-death experience (NDE) is a conscious experience accounted for at the time of death, which collates with the previous concept analysis (16). However, it was identified from the existing concept analysis that near-death experience occurs in both lifethreatening conditions as well as non-lifethreatening conditions. The attributes of the aforementioned near-death experiences are similar to one another both in the characteristics and intensity of the events. Concerning individuals with NDE in lifethreatening conditions, nursing personnel are expected to facilitate their patients by being active listeners, assessing the non-verbal cues psychological (patient's and spiritual assessment), NDE education to the patient in the suspicion of near-death account, and practicing a non-judgmental attitude. It is suggested to regard the complexity of the experience, and instead of drafting one's own values and beliefs, healthcare providers should assist patients in integrating their NDEs into their lives for better living outcomes. With a deeper understanding of the near-death phenomenon in the past decades, the majority of near-death studies have affirmed the characteristics of the experience are based on the four major components of the account, i.e., Cognitive, affective, paranormal, and transcendental Considering (5). these

components, nursing personnel are expected to provide their patients with a relaxing environment so the patient with NDE will be able to articulate these features in an environment free of biases or judgments. When sharing such features with the patients, the nursing personnel, it is the nursing responsible for assisting the patient in integrating near-death experiences into the patient's life. NDE integration will help the patient to transform holistically in all aspects of physiological, psychosocial, emotional, and spiritual well-being (7).

Conclusion

To conclude, the near-death experience can be defined as a real, conscious, and subjective experience that is reported by individuals with or without life-threatening conditions and is characterized by the detailed memory of cognitive, affective, paranormal, or transcendental components. Above all those explanatory frameworks (psycho-physiological, transcendental, or empiricist/survivalist models), it is the health care provider's responsibility to recognize this phenomenon and must respond as an active listener, non-judgmental, and educator to patients and their families. Unfortunately, negative remarks from healthcare professionals upon disclosure of NDE are because of the lack of or insufficient knowledge about the phenomenon. It is recommended to initiate a curriculum related to NDE in health care professions for the management of NDE individuals for early identification and integration of NDE into patients' lives. This integration is expected to bring positive outcomes in the physiological, psychological, mental, social, and spiritual well-being of the patients.

Acknowledgments

I would like to acknowledge Professor Muhammad Ishtiaq for providing me with a thorough understanding of the steps of concept analysis.

Conflict of interest

The author has no conflict of interest to declare.

References

1. Facco E, Agrillo C. Near-death-like experiences without life-threatening conditions or brain disorders: A hypothesis from a case report. Frontiers in Psychology. 2012 Nov 15;3:490.

2. Royse D, Badger K. Burn survivors' near-death experiences: A qualitative examination. OMEGA-Journal of Death and Dying. 2020 Feb;80(3):440-57.

3. Van Lommel P. Non-local consciousness: A concept based on scientific research on near-death experiences during cardiac arrest. Journal of Consciousness Studies. 2013 Jan 1;20(1-2):7-48.

4. Seeing the light: Dissecting near death, Psychology Today, 2013 [Internet]. 2018. Available from:

https://www.pamelaweintraub.com/post/seeingthe-light-dissecting-near-death-psychologytoday-2013

5. Greyson B. Getting comfortable with near-death experiences: An overview of neardeath experiences. Missouri Medicine. 2013 Nov;110(6):475.

6. Moody RA. Life after life. Random House; 2001.

7. Klemenc-Ketis Z. Life changes in patients after out-of-hospital cardiac arrest: the effect of near-death experiences. International Journal of Behavioral Medicine. 2013 Mar;20(1):7-12.

8. Zingrone NL, Alvarado CS. The Handbook of Near-Death Experiences: Thirty Years of Investigation. 2009.

9. Nobakht HN, Dale KY. An exploration of the roles of trauma and dissociation in mystical experiences and near-death experiences. Journal of Spirituality in Mental Health. 2018 Oct 2;20(4):321-32.

10. James D. What emergency department staff needs to know about near-death experiences. Advanced Emergency Nursing Journal. 2004 Jan 1;26(1):29-34.

11. Thonnard M, Charland-Verville V, Brédart S, Dehon H, Ledoux D, Laureys S, et al.

Characteristics of Near-Death Experiences Memories as Compared to Real and Imagined Events Memories. PLoS One. 2013;8(3):1–5.

12. Bianco S, Sambin M, Palmieri A. Meaning making after a near-death experience: The relevance of intrapsychic and interpersonal dynamics. Death Studies. 2017 Oct 21;41(9):562-73.

13. Rominger R. Postcards from heaven and hell: Understanding the near-death experience through art. Art Therapy. 2010 Jan 1;27(1):18-25.

14. Rawlings D, Devery K. Near death experience and nursing practice: Lessons from the palliative care literature. Australian Nursing and Midwifery Journal. 2015 Mar;22(8):26-9.

15. Walker LO, Avant KC. Strategies for theory construction in nursing. Upper Saddle River, NJ: Pearson/Prentice Hall; 2005.

16. Simpson SM. Near-death experience: A concept analysis as applied to nursing. Journal of Advanced Nursing. 2001 Nov 27;36(4):520-6.

17. Definition of near. In 2023. Available from: https://www.merriamwebster.com/dictionary/near

18. Near. In 2023. Available from: https://dictionary.cambridge.org/dictionary/englis h/near

19. Death. In 2023. Available from: https://dictionary.cambridge.org/dictionary/englis h/death

20. Definition of death. In 2023. Available from: https://www.merriamwebster.com/dictionary/death

21. Tassell-Matamua NA, Lindsay N. "I'm not afraid to die": the loss of the fear of death after a near-death experience. Mortality. 2016 Jan 2;21(1):71-87.

22. Experience. In 2023. Available from: https://dictionary.cambridge.org/dictionary/englis h/experience

23. Definition of experience. In 2023. Available from: https://www.merriamwebster.com/dictionary/experience

24. Definition of near-death experience. In 2023. Available from: https://www.merriam-webster.com/dictionary/near-

death%20experience

25. Near-death experience. In 2023. Available from:

https://dictionary.cambridge.org/dictionary/en glish/near-death-experience

26. Belanti J, Perera M, Jagadheesan K. Phenomenology of near-death experiences: A

cross-cultural perspective. Transcultural Psychiatry. 2008 Mar;45(1):121-33.

27. Duffy N, Olson M. Supporting a patient after a near-death experience. Nursing2022. 2007 Apr 1;37(4):46-8.

28. Corazza O. The handbook of near-death experiences: Thirty years of investigation; 2010.
29. Greyson B. Western scientific approaches to near-death experiences. Humanities. 2015 Nov 9;4(4):775-96.

30. Holden JM, Kinsey L, Moore TR. Disclosing near-death experiences to professional healthcare providers and nonprofessionals. Spirituality in Clinical Practice. 2014 Dec;1(4):278-87.

31. Greyson B. Consistency of near-death experience accounts over two decades: Are reports embellished over time? Resuscitation. 2007 Jun 1;73(3):407-11.

32. Nelson KR, Mattingly M, Lee SA, Schmitt FA. Does the arousal system contribute to near-death experience? Neurology. 2006 Apr 11;66(7):1003-9.

33. Lai CF, Kao TW, Wu MS, Chiang SS, Chang CH, Lu CS, et al. Impact of near-death experiences on dialysis patients: a multicenter collaborative study. American Journal of Kidney Diseases. 2007 Jul 1;50(1):124-32.

34. Hoepner R, Labudda K, May TW, Schoendienst M, Woermann FG, Bien CG, et al. Ictal autoscopic phenomena and near-death experiences: A study of five patients with ictal autoscopies. Journal of Neurology. 2013 Mar; 260:742-9.

35. Greyson B. The near-death experience scale: Construction, reliability, and validity. The Journal of Nervous and Mental Disease. 1983 Jun 1;171(6):369-75.