

Perceptions of intensive care nurses on the concepts of brain death and coma: a metaphor analysis

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ABSTRACT

Aims: It is important for intensive care nurses to have knowledge about the concepts of brain death and coma and to take precautions against ethical problems. This study aimed to determine the perceptions of intensive care nurses regarding the concepts of brain death and coma through metaphors.

Methods: Metaphor analysis, one of the qualitative research designs, was used. The metaphors produced by the intensive care nurses were defined as concepts and a list was created. Using content analysis, 20 intensive care nurses produced 20 different metaphors for the question, "Coma is similar to ..., because ...". Nurses mostly likened the concept of a "coma" to a "plant", "stay together", and "deep sleep". They also produced 20 different metaphors for the question, "brain death is similar to ..., because...".

Results: Nurses mostly likened the concept of brain death to a "plant", "absolute death", and a "coma". Brain death and a coma were common to three of the metaphors produced by nurses ("uncertainty/unresponsiveness", "death/eternity", and "permanent breakdown" metaphors). The answers given to the questions about the concepts of brain death and a coma were "uncertainty/unresponsiveness", "death/eternity", and "permanent breakdown" metaphors.

Conclusion: The nurses confused the concepts of a coma and brain death with each other and had similar perceptions of the two concepts.

Keywords: Brain death, coma, intensive care, metaphor, nurse

INTRODUCTION

In consciousness disorders, consciousness is partially or completely lost, starting from a sleep state and progressing to a state of unresponsiveness to any stimulus (coma), as a result of impairment in the normal functions of the brain for any reason. Being in a coma is a result of serious brain dysfunction caused by structural, chemical, electrical, or toxic disorders of the brain.¹ The comatose patient is unstimulated and unresponsive. The absence of eye-opening movement even in the presence of strong stimuli is a characteristic clinical finding for a coma.² Comatose patients are unconscious but have circulation and respiration. The patient in a coma may clinically recover, progress to brain death, or fall into a vegetative state.^{3,4}

The concept of brain death is defined as the irreversible loss of brain, brain stem, and cerebellum activities. In adults, brain death often results from traumatic brain injury or subarachnoid hemorrhage. In children, the most common cause of brain death is non-accidental trauma. The most common extracranial causes of brain death include cardiopulmonary arrest and inadequate cardiopulmonary resuscitation.^{5,6} According to the American Academy of Neurology (AAN), three findings

(being in a coma, the absence of brainstem reflexes, and the presence of apnea) are necessary to confirm the diagnosis of brain death.^{7,8} Patients suspected of having brain death are primarily evaluated for exclusion criteria and a detailed history is reviewed. Comprehensive laboratory tests are performed to exclude endocrine problems and acid-base and electrolyte disturbances that may cause changes in consciousness. Patients suspected of having brain death are evaluated in terms of drug-related poisoning.^{5,7} Brainstem reflexes are carefully examined for the evaluation of brain death.⁷ Patients who develop brain death give no response to painful stimuli, except for spinal reflexes and purposeless involuntary movements.⁵

Intensive care nurses take active roles in the treatment and care practices of patients who are in critical condition and who develop neurological problems such as coma and brain death. They have critical roles in the process of diagnosing patients with altered consciousness, providing hemodynamic and emergency medical support, and meeting their care needs. Recognition of changes in consciousness in the early period affects the treatment results and the clinical picture of

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the patient. Intensive care nurses closely evaluate the state of consciousness of patients. It assumes important responsibilities in pharmacological and non-pharmacological interventions to support cardiopulmonary functions.

It is stated that intensive care nurses who participate in the decisions regarding the condition of end-stage patients or take the role of practitioners frequently experience ethical problems related to the patient's condition. To cope with the ethical problems that nurses face, they need to have knowledge about the subject and take precautions against ethical problems.^{9,10} At the same time, the level of knowledge and perceptions of nurses about brain death and coma increase the performance of intensive care nurses, their adaptation to the profession, and work efficiency, and affect their professional development.

A metaphor is an indicator of an individual's perceptions of a concept. Metaphors are a way of expressing positive or negative feelings with their thoughts.¹¹ Metaphors have unique meanings, contribute to creating perspectives,^{12,13} enable the experiences and previous lives of the individual to be directed from a certain way of understanding to another one through the mind, and lead to the formation of different structures related to concepts.¹⁴

It is important to determine the metaphorical interpretation to understand the perceptions of intensive care nurses on these concepts and to provide a different understanding of nursing care. The analysis of nurses' perceptions of a concept is a new approach used to improve nursing care. The metaphorical perceptions of intensive care nurses will bring a new dimension to nursing care. The results of this research will provide data on the development of the awareness of nurses who provide care to comatose patients regarding brain death and changes in consciousness.

The present study aimed to determine the perceptions of intensive care nurses on the concepts of brain death and coma through metaphors. In this study, we sought to identify the metaphors for coma and brain death used by intensive care nurses.

METHODS

Ethics

Written approval (Date: 06.08.2022, Decision No: 2022-KAEK-62) was received from the Kastamonu University Clinical Researches Ethics Committee to implement the study. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Research Setting

The research was carried out in the intensive care units of a training and research hospital located in the western Black Sea region of Türkiye. The hospital has five intensive care units: the pediatric intensive care unit, the adult intensive care unit, the coronary intensive care unit, the cardiovascular surgery intensive care unit, and the neonatal intensive care unit.

Research Design

Phenomenology, a qualitative research design, was used in the research. The phenomenology design focuses on phenomena of which we are aware but do not have an in-depth or detailed understanding. Phenomenology evaluates lived experiences. Phenomenology is first experienced by individuals to discover the common meanings underlying the phenomenon who then try to describe the world and explain the essence of lived experiences. There is a link between the phenomenon and the

individuals who experience the phenomenon; the starting point of phenomenology is the facts themselves.¹⁵

This research method borrows experiences from individuals to describe and interpret their experiences. All the phenomena experienced by individuals can be researched and explained. Through phenomenology, individuals' experiences, perceptions, and meanings related to a phenomenon are uncovered.^{15,16} During the determination of the target area in metaphor analysis, the subject and the questions to be asked are selected at first and a template is created for the research and evaluation process.¹⁷ After these preparations are completed, the metaphors collected in the research are grouped and the subject headings are identified. Researchers need to understand and correctly analyze the metaphors used to conduct their research properly. The analysis to be made within the concept of prepared subjects requires a detailed evaluation.^{18,19}

Research Population and Sample

In this study, the population consisted of 112 nurses working in the intensive care units of the Kastamonu Training and Research Hospital in Türkiye. The data were collected between 1 July and 31 August 2022. The semi-structured interview survey was presented to three experts. After approval, the research was initiated.

Twenty nurses were not included in the study since they were on sick or paid leave between these dates. Thus, a total of 92 nurses were invited to the study. Of the 92 invited nurses, 25 agreed to participate in the study. Five nurses were not included in the study since they did not fully complete the data collection form in their justifications for the metaphors. Therefore, 20 nurses constituted the sample of the study, reaching 18% of the research population. Nurses participating in the study were given surveys and asked to fill them out. There is no relationship between nurses and researchers.

The metaphors produced by the intensive care nurses were defined as concepts and a list was created. Accordingly, whether the metaphors were expressed clearly was reviewed throughout the study.

Data Collection Tools

The data were collected after working hours using a nurse information survey and the metaphoric perceptions data collection survey.

Nurse information survey: The survey consisted of six questions regarding the nurses' age, gender, education level, professional experience, and previous experiences of providing care to brain-dead and comatose patients.

Metaphoric perceptions data collection survey: The researchers prepared the survey. The survey included the following sentences: "Coma is like/similar to Because it is" and "Brain death is like/similar to Because it is". The relationship between the subject and the source of the metaphor was examined using the word "like". The meaning and reason attributed to this metaphor were revealed using the word "because".

Data Collection

The nurses were first asked to complete the nurse information survey after working hours. The completion of the surveys lasted approximately 10 minutes. To reveal the metaphors identified by the nurses regarding the concepts of "Coma"

and “Brain death”, they were asked to fill in the gaps in the statements “Coma is like/similar to Because” and “Brain death is like/similar to Because”.

The nurses were asked to liken “coma” and “brain death” phenomena to something else (an entity, living thing, object, etc.) and briefly state the reason for this likening. These compositions, written by the nurses in their handwriting, were used as the main data source in the study. The data were collected using surveys in Turkish. After the manuscript was written, the manuscript was translated from Turkish to English.

Statistical Analysis

Content analysis was performed to determine the themes in a way that readers could easily understand the raw verbal or written data.²⁰ In the study, the data were primarily analyzed using content analysis.

Secondly, the metaphors determined as a result of the content analysis were grouped into conceptual categories and correlated with the thoughts in the related metaphor. To reveal the perceptions of the nurses regarding a “coma” and “brain death”, metaphors were specified as “because”. Considering the explanations in the interview surveys, categories were determined based on the nurses’ sentences according to content integrity. Frequency was also examined in the data analysis.

The analysis and interpretation of the data were performed in five stages.²¹ In this study, the analysis of the data was carried out in the following five stages using “content analysis”:

Coding and extraction stage: The data were primarily subjected to an extraction process. Complete data were numbered and given a code (such as CMC or BDMC). The code “CMC” formed the code for the metaphor produced for a coma. The code “BDMC” formed the code for the metaphor produced for brain death. Four “interview forms”, in which a metaphor was included but not justified, were eliminated and not evaluated since they included meaningless statements. A visual metaphor chart was created according to the participants’ answers. In line with this chart, it was also evaluated whether the nurses clearly defined a certain metaphor in the collected data.

Sample metaphor analysis: The metaphors produced by the participants were analyzed by creating codes. The relationship between similarly identified metaphors was examined.

Categorization: The metaphor images created by the participants were grouped according to similar characteristics related to the concept of a coma and brain death. Three valid metaphors of coma and five valid metaphors of brain death identified by the 20 nurses were collected under the conceptual category. Each metaphor was correlated with the meaning and perception that the nurses attributed to the concepts of a coma and brain death.

Validity and reliability: The approximate ratio representing the number of nurses participating in the research, the categories as the main themes from the obtained concepts, and the metaphors in the sub-headings were determined. To ensure reliability, after the categories were created, a paper on which the metaphors, justifications, and names of the conceptual categories were written was given to three faculty members working in the nursing department and they were asked to fill in. All metaphors were matched with a category. Thereafter, the matching made by the faculty members between the metaphors and the created categories was compared with the matching

made by the researchers. Following this comparison, the formula “reliability=consensus/consensus+disagreement” was used. In metaphors, the reliability of the metaphor categories was calculated using this formula. As a result, the reliability was calculated as “19/19+1=0.95”. The result meant that the study was reliable.

Transfer of data to computer environment: The metaphors were divided into categories according to their justifications and the frequency (f) of participants in the category they represented was calculated. The metaphors, which were categorized according to the justifications, were coded and reported on according to the participants. The letter M was used for male participants and the letter F was used for female participants to identify to whom the citations belonged. The metaphors that emerged as a result of the research were categorized according to their common features and analogy aspects. In the analysis of the nurses’ descriptive characteristics, frequency and percentages were calculated using the Statistical Program for the Social Sciences (SPSS) 21.0 software program.

RESULTS

This section includes information on the descriptive characteristics of the participants and the metaphors they identified regarding the concepts of a coma and brain death. The mean age of the participants was 30.75±1.59 years (min: 22 years, max: 45 years) and 65% of them were female. Of these participants, 60% had been working in the intensive care unit for less than five years and 90% reported that they had previously provided care to a patient in a vegetative state and/or in a coma (Table 1).

Table 1. Descriptive characteristics of the intensive care nurses (n=20)

Variables	Frequency (n)	Percentage (%)
Age mean (SD): 0.75 (1.59) (min: 22, max: 45)		
Gender		
Female	13	65
Male	7	35
Education status		
High school	2	10
Undergraduate degree	14	70
Master’s degree	4	20
Duration of employment in the nursing profession		
Less than 5 years	50	50
5-10 years	25	25
15-20 years	15	15
20 years and over	10	10
Duration of employment in the intensive care unit		
Less than 5 years	12	60
5-10 years	4	20
15-20 years	3	15
20 years and over	1	5
Experience providing care to a brain-dead patient		
Yes	18	90
No	2	10
Experience in providing care to a comatose patient		
Yes	18	90
No	2	10

SD: Standart deviation, min: Minimum, max: Maximum

Table 2 shows the metaphors that the intensive care nurses identified for the concept of a “coma”. The intensive care nurses identified 10 different metaphors for the question, “Coma is similar to ..., because ...”. Nurses mostly likened the concept of a “coma” to a “plant” (n=4, 20%), “stay together” (n=4, 20%), and “deep sleep” (n=4, 20%).

Table 2. Metaphors identified by the intensive care nurses for coma (n=20)

Metaphor Code	Metaphors	Frequency	%	Expressions of the nurses about the reasons for the metaphors they identified
1	Plant	4	20	“A coma is like a plant. Because it is there but cannot tell us his condition.” (F, A27) “A coma is like a dehydrated plant because it is in a bad condition” (F, A22) “A coma is like a plant because it performs vital functions but there is no reaction.” (M, A28) “A coma is like a tree because it can hear us but has motion and response.” (F, A26)
2	Unresponsiveness	2	10	“A coma is like deep sleep because there is no response.” (M, A29) “A coma is like an inability to perform vital functions because the patient is unconscious and unresponsive to any stimulus.” (M, A29)
3	Stay together	4	20	“A coma is like being half-dead because there is no consciousness and breathing but the heart works.” (M, A40) “A coma is like being in limbo because you are either here or you are not.” (F, A27) “A coma is like being unconscious for a long time because the patient in a coma has no reaction and is unconscious.” (M, A27) “A coma is similar to a partial and temporary loss of vital functions because the patient is unconscious and does not move.” (F, A42)
4	Broken electrical home appliance	1	5	“A coma is like a broken electrical home appliance because it only transmits electricity without any function.” (F, A43)
5	Deep sleep	4	20	“A coma is like deep sleep because the brain functions are working but the perception is limited.” (M, A26) “A coma is like deep sleep because the patient cannot react to anything.” (F, A23) “A coma is like deep sleep because the patient is unresponsive for a long time.” (F, A26) “A coma is similar to a patient in deep sleep because there is no response to painful stimuli.” (F, A45)
6	Death	1	5	“A coma is like the end of life because there is no function.” (F, A27)
7	Non-living object	1	5	“A coma is like a non-living object because it cannot perceive anything.” (F, A39)
8	Pre-death coldness	1	5	“A coma is similar to pre-death coldness because the person has lost all functions literally but is breathing and the heart is working.” (M, A30)
9	Time capsule	1	5	“A coma is like a time capsule because the patient wakes up and continues life when the right time comes.” (F, A28)
10	Pulse oximeter out of battery	1	5	“Coma is similar to a pulse oximeter out of battery because it appears to be present but not functionally here.” (F, A29)

Table 3 shows the metaphors that the intensive care nurses identified regarding the concept of “brain death”. The intensive care nurses identified 16 different metaphors for the question, “Brain death is like/similar to, because ..……”. Nurses mostly likened the concept of brain death to a “plant” (n=3, 15%), “absolute death” (n=2, 10%), and a “coma” (n=2, 10%).

The categories of the metaphors obtained as a result of the content analysis are; in this study, the answers given by the nurses to the questions about the concepts of brain death and coma produced three common metaphors (“uncertainty/unresponsiveness”, “death/eternity”, and “permanent breakdown”). According to this result, the nurses were confused due to the concepts of coma and brain death and they had similar perceptions regarding the two concepts (Figure).

Table 3. Metaphors identified by the intensive care nurses for brain death (n=20)

Metaphor Code	Metaphors	Frequency	%	Expressions of the nurses about the reasons for the metaphors they identified
1	Dead tree	1	5	“Brain death is like a dead tree because the patient is there as an entity but has no system to manage and develop.”
2	Being lost	1	5	“Brain death is like being lost because it is irreversible.”
3	Perished house	1	5	“Brain death is like a perished house because it is a difficult situation.”
4	Partially dead	1	5	“Brain death is like partial death because the brain does not work, but all body organs work without respiratory arrest.”
5	Endless road	1	5	“Brain death is an endless road because the patient has entered a road with no end.”
6	Balloon	1	5	“Brain death is like a balloon because if you inflate it, it flies, if you cut off the support it deflates (dies).”
7	Carriage water	1	5	“Brain death is like carriage water because when you cut off the life support (carriage water), death occurs.”
8	Absolute death	2	10	“Brain death is like the loss of all functions because the patient’s brain stem is completely dysfunctional. It is a condition that results in absolute death.” “Brain death is like the irreversible loss of brain functions because the patient is inadequate for all kinds of treatment and the life can be terminated.”
9	Plant	3	15	“Brain death is like a vegetative state because brain functions stop and other functions are active.” “Brain death is like a plant because there is no movement.” “Brain death is a vegetative state because the brain has lost its function, except for vital organs such as the heart and lungs.”
10	Pre-death	1	5	“Brain death is similar to pre-death because the patient cannot perform respiratory and vital activities without support.”
11	Earthquake	1	5	“Brain death is like an earthquake because it causes destruction and unexpected pain to the family.”
12	Eternal sleep	1	5	“Brain death is like eternal sleep because the patient cannot survive without mechanical support.”
13	Coma	2	10	“Brain death is similar to the condition of a comatose patient because there is no response.” “Brain death is like coma because there is no reaction at all.”
14	Flower in a pot	1	5	“Brain death is like a flower in a pot because functions remain when the appropriate environment is provided.”
15	Sculpture	1	5	“Brain death is like a sculpture because there is no reaction.”
16	Broken air fryer	1	5	“Brain death is like a broken air fryer because it exists physically but does not function.”

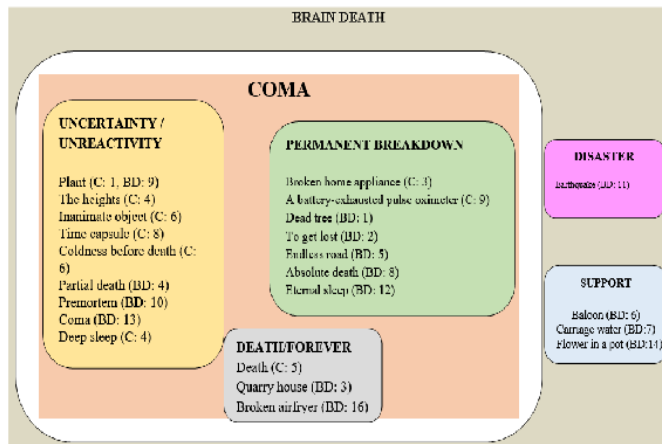


Figure. Categories of the metaphors obtained as a result of the content analysis (C: Coma, BD: Brain death).

DISCUSSION

Metaphors are powerful mental tools used to understand and explain an abstract, complex, or theoretical phenomenon. This study aimed to reveal the metaphor perceptions of intensive care nurses on the concepts of brain death and coma. It was seen that three of the metaphors produced by nurses were common (uncertainty/unresponsiveness, death/eternity, and permanent breakdown). Metaphors produced by the nurses regarding the concept of brain death were categorized as disaster and support.

Uncertainty/Unresponsiveness

According to Pearson, the uncertainties and contradictions regarding the concept of brain death and its uncertainty are directly correlated with the concept of death by nurses working in intensive care units,²² because brain death is defined as real death without the hope of recovery. However, the feeling that the brain-dead patient is still alive due to his/her physical appearance increases the feeling of uncertainty. In studies examining the level of knowledge of nurses working in various clinics on brain death, it was stated that the level of knowledge of nurses was not sufficient.²³⁻²⁵ Metaphors created by some of the intensive care nurses regarding the concept of brain death were partially dead, a plant, pre-death, a coma, and a sculpture. This finding suggests that some of the nurses perceived that the condition of brain-dead patients is reversible. Therefore, reducing the uncertainty about brain death will contribute to the nurses' ability to explain brain death to patient relatives and reduce the stress they experience.

Most comatose patients recover over time. Waking up from a coma can be quick or slow. Comatose patients are unconscious but have circulation and respiration. The patient may recover clinically, develop brain death, or progress to a vegetative or minimally conscious state.^{3,4} In this study, the metaphors created by the intensive care nurses on the concept of a coma stay together, deep sleep, a non-living object, and a time capsule. This finding suggests that some of the nurses had perceptions of uncertainty between life and death regarding the concept of a coma. In another study conducted with nurses, the answer, "As long as the individual receives care, they can live for years without knowing their environment", was given at a rate of 87%.²³ This finding of the study supports the literature.

Death/Eternity

Before the modern era, the concept of death was defined as the fact that the soul leaves the body after respiratory and cardiac

arrest. In the modern age, the concept of death has changed. Death has become institutionalized as it is transferred from home to hospital. Eighty percent of deaths occur in health institutions, which makes death a cold, medical death.^{26,27} Brain death is considered the death of a person. The irreversibility in the definition of death expresses the impossibility of recovery. In the study by Sapulu,²⁸ it was determined that 92.67% of intensive care nurses gave the correct answer to the statement, "If the brain functions stopped even if the heartbeat is provided with mechanical support, brain death has occurred". In this study, the intensive care nurses expressed their metaphors, using comparisons such as a dead tree, being lost, an endless road, absolute death, and endless sleep, by reflecting that brain death is similar to death and eternity.

Permanent Breakdown

Death is always considered a permanent breakdown as well as deviating from the norm in today's societies. New technologies are creating a new patient population and a new type of hospital space. The life of this patient population whose death is inevitable under normal conditions can be sustained artificially and/or delayed by these new technologies in intensive care units where these technological treatments and care applications are performed.²⁹ It would be appropriate to say that the new place of death in the 21st century is intensive care units. Moreover, considering all these discussions, intensive care units where this "technical death", defined as a life permanent breakdown and deviation from the norm, is closed are spaces for otherness.³⁰ The intensive care nurses also expressed their metaphors as a "perished house", a "broken air fryer", a "pulse oximeter out of battery" and a "broken electrical home appliance", stating that brain death and comas are crises.

Disaster

An earthquake is a disaster that cannot be predicted or controlled. After an earthquake, buildings of people may be damaged and a relative may die. The devastating and unavoidable effects of earthquakes often lead to reactions such as fear, helplessness, and terror in victims. This result is one of the most prominent features of disasters such as earthquakes that exceed the limits of humans and show that they are inadequate.^{31,32} In this study, the intensive care nurses developed an earthquake metaphor regarding the concept of brain death. It is thought that the sudden and uncontrollable occurrence of brain death and the psychological reactions in families after the loss were effective in the creation of this metaphor.

Support

Among the criteria for diagnosing brain death, the lack of movement or spontaneous breathing after four minutes of separation from the mechanical ventilator and the presence of apnea indicate that brain death will occur without a support system.^{23,32} Karaman³¹ found that 85.8% of the intensive nurses answered that "respiration and circulation can be maintained for a short time in a brain-dead individual by connecting to mechanical support". In this study, the metaphors of a balloon, carriage water, and a flower in a pot reflected comparisons such as deflating like a balloon, being dehydrated when the water is cut off, and continuing life when necessary conditions are provided for a flower in a pot. This result shows that brain death is perceived similarly to the findings in the literature. However, when the brain death tests are positive, the patient will be

considered dead even if support continues and the patient's relatives will be informed about organ donation. Considering this information, the produced metaphors conflict with the literature since the patient cannot continue living even if support is provided.

Limitations

The study was conducted in a single center, namely a training and research hospital in Türkiye. The findings of the research represented the opinions of 20 intensive care nurses working in the hospital where the research was conducted. Therefore, the findings cannot be generalized to all intensive care nurses.

Since the nurses included in the research used their expressions, they were not affected by each other, which increases the accuracy of the data.

CONCLUSION

In this research, the answers given by nurses to the questions about the concepts of brain death and comas produced three common metaphors ("uncertainty/unresponsiveness", "death/eternity", and "permanent breakdown"). According to this result, it was seen that the nurses confused the concepts of a coma and brain death and had similar perceptions of the two concepts. The results of this research showed that the awareness of nurses, who provide care to brain-dead and comatose patients, on the changes in consciousness should be increased. It is recommended to improve the knowledge of the concepts of brain death and coma with regular in-service training sessions.

ETHICAL DECLARATIONS

Ethical approval

Written approval (Date: 06.08.2022, Decision No: 2022-KAEK-62) was received from the Kastamonu University Clinical Researches Ethics Committee to implement the study. Institutional permission was obtained for data collection.

Informed Consent

All participants were informed about the research and their informed consent was received.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors declared no conflicts of interest concerning the authorship and/or publication of this article.

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper and that they have approved the final version.

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