

BACKGROUND

Research Question:

What is the current state of the scientific literature on chaos in emergency nursing?

Purpose:

The purpose of this research is to explore how chaos is defined in the context of nursing through the performance of a narrative review.

Introduction:

Chaos is a subset of complex adaptive systems (CASs) science and has its origins in meteorology and mathematics (Dizikes, 2011). It was discovered by Dr. Edward Lorenz and disseminated in a publication titled *Deterministic nonperiodic flow* (Lorenz, 1963). Chaos is described and explained by chaos theory. Chaos theory suggests that apparent randomness is governed by underlying order and outlines non-linear thinking. Small changes in initial conditions can produce large changes in later conditions, a property of chaos popularly known as the Butterfly Effect. Chaos is seen in diverse phenomena and plays a role in nursing science (Lorenz, 1994, p. 5).

Background:

Nursing literature surrounding chaos is limited and dated. Vincenzi explored the idea of chaos in nursing focusing on individuality, uniqueness, and holism (1994, p. 37). Barker suggested chaos could contribute to a new metaparadigm in nursing (1996, p. 235). Forcing linear models on nonlinear systems, such as nursing, may lead to limited change, conflict, and incorrect identification of cause and effect (Sharp & Priesmeyer, 1995, p. 73).

METHODS

Methods:

“Chaos,” “chaos theory,” and “nursing” were entered as a search term by title and abstract in The Journal of Emergency Nursing, Nursing Science Quarterly, Prehospital and Disaster Medicine, CINAHL, and Google Scholar. Abstracts were read and were screened for properties that met the scientific definition of chaos. Chaos screening criteria included mention, references, or suggestions of these following properties of chaos: determinism, aperiodicity, nonlinearity, non randomness, sensitive dependence on initial conditions, exhibition of fractals, and movement toward an attractor.

A data extraction table was created to collect these results including a description of the piece of literature, how it defined chaos, concepts of chaos exhibited in emergency nursing, and properties of chaos.

Discussion:

A narrative review was necessary to evaluate the existing body of literature of chaos in nursing because of the lack of a clear definition of chaos in nursing, ambiguity in definitions, and failure to define, suggest, or allude to chaos in a scientific way, leading to varied meanings of chaos.

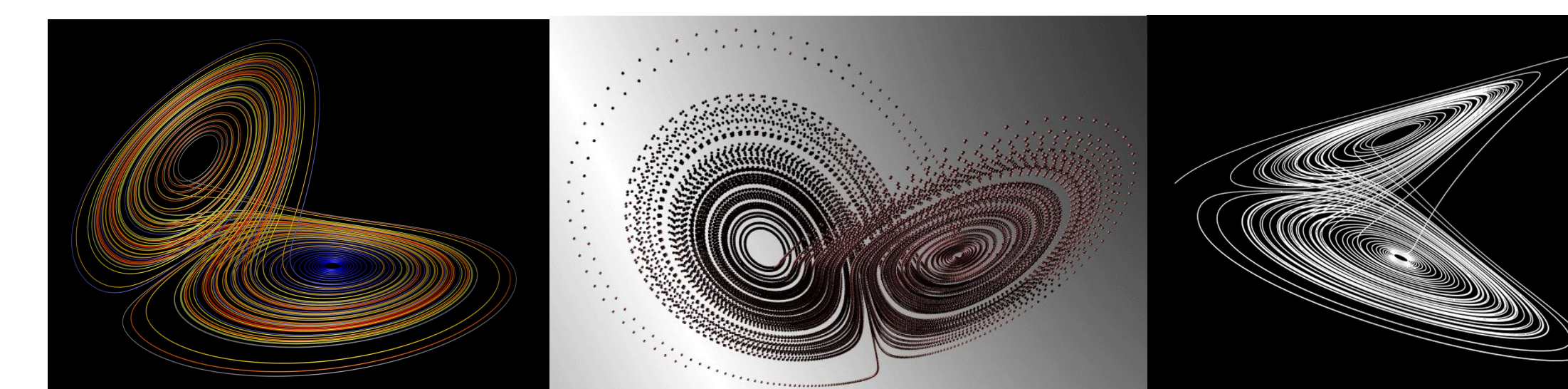
Findings:

- 29 articles met inclusion criteria.
- Chaos exists in theoretical and empirical settings.
- Variation in defining chaos, including a lack of criteria for chaos, presented differing definitions.
- Searching for nursing literature on chaos is chaotic.

CONCLUSIONS

Conclusions:

- A single, universal, definition of chaos in emergency nursing does not exist.
- Properties of chaos may be qualitative, quantitative, or both.
- Not all nursing literature that uses the term chaos refers to it in the scientific definition. This leads to varied meaning behind chaos.
- Practical implications for chaos may exist. They include clinical practice, nursing education, nursing administration, and interdisciplinary team-based approaches.
- Chaos theory may provide an alternative nonlinear way of thinking in nursing.
- Chaos has been underexplored in the nursing literature.
- Further research is necessary to understand the scientific meaning of chaos in emergency nursing.



Chaos is deterministic, contains orbits, and operates within phase space. Chaos is defined mathematically as “The property that characterizes a dynamical system in which most orbits exhibit sensitive dependence; full chaos” (Lorenz, 1993, p. 207).

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