

Review Article

Principle-based concept analysis: A narrative review from a nursing perspective

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Abstract

This study seeks to delineate the methodology underpinning principle-based concept analysis. To initiate this study, a non-systematic exploration was conducted in the PubMed database and Google Scholar search engine, with no temporal constraints. The keywords employed for this search encompassed "concept analysis", "principle-based concept analysis", and "penrod and hupcey". Ultimately, the full texts of sixteen studies, each delineating their methodological approach as concept analysis based on principles, were procured for a comprehensive examination. The findings indicate that principle-based concept analysis is executed with a focal emphasis on the imperative incorporation of four foundational philosophical principles: epistemology, pragmatism, linguistics, and logic at each stage of the analytical process. The methodological sequence comprises the following steps: 1) the discernment and selection of pertinent texts, 2) the meticulous sampling strategy aligned with the identified concept, and 3) the comprehensive internal and interdisciplinary analysis. This approach posits concepts as experiential abstractions derived from reality or truth that transcend the contextual dimensions of human existence. The amalgamation of these truths culminates in the collective expression, elucidating the most plausible approximation of truth. Consequently, the bedrock of principle-based concept analysis rests upon the notion of probable truth, as delineated within the scientific literature. The outcomes of a concept analysis are essential for researchers aiming to discern and pursue avenues for the development of the examined concept. In the context of principle-based concept analysis, each guiding principle facilitates an understanding of the strengths and limitations inherent in the current state of the concept within the scientific literature.

Keywords: Concept Analysis, Principle-based Concept Analysis, Penrod and Hupcey, Methodology, Review.

1 | Introduction

Concepts serve as mental abstractions or derived semantic units that are formulated to represent specific aspects or elements of human experience [1, 2]. The primary objective of concept analysis is to scrutinize, define, construct, and assess a given concept [3, 4]. This analytical process is essential for achieving a more profound understanding of the concept in question [5]. Concept analysis involves discerning the characteristics and relationships of a concept with others [6, 7] with the ultimate aim of providing a precise definition [8]. The selection of a concept analysis method poses challenges due to the diverse approaches that have evolved over the years [2].

Within the realm of nursing science, there exists a wealth of resources that describe and evaluate various analysis methods

and studies based on these methods. Notably, the method proposed by Walker and Avant in 1983 stands as one of the pioneering examples discussing nursing science concepts [9]. Walker and Avant were the first to engage in theoretical discussions regarding nursing science concepts [10]. Their method draws inspiration from John Wilson's seminal book on concept analysis from 1970 [11].

Other analysis methods that have emerged in nursing science include evolutionary concept analysis by Rodgers in 1989 [12], simultaneous analysis by Haase et al. in 1992 [13], practical concept application method by Morse in 2000 [14], the principles-based method by Penrod and Penrod in 2005 [2], and the hybrid model of concept development by Schwartz-Barcott & Kim (2000) [15]. A scoping review conducted by Rodgers et al.,

(2018) listed various concept analyses, highlighting Walker and Avant's three methods, the evolutionary method, and principle-based concept analysis as the most effective approaches [16].

Principle-based concept analysis, as initially described by Morse et al. in articles [17-19], incorporates four principles derived from the philosophy of science (epistemology, pragmatics, linguistics, and logic). This approach scrutinizes scientific texts to determine the empirical information regarding the concept, emphasizing that the concept is an abstraction from reality shaped by living in the world with others, not solely the product of scientific endeavors [2]. "Concept analysis" serves as a tool to enhance understanding of a phenomenon, while "concept development" aims to advance scientific understanding of a concept [20]. The theoretical background in concept analysis is crucial for establishing theoretical definitions and reinforcing theories through well-defined concepts [21].

Critical analysis of scientific texts, according to this approach, yields the best estimation by researchers of the "probable truth" surrounding a concept at a given time [22]. This probable truth reflects the scientific landscape around a concept, which evolves with scientific progress. Consequently, the analysis of a concept is not static [23]. This method results in a definition that aligns scientific understanding with theoretical comprehension, elucidating what is known about the concept at a specific time [24]. Identifying gaps and contradictions in scientific conceptualization enhances the efficacy of concept analysis for the advancement of nursing as a science [25].

In this method, concept analysis unfolds in three stages, with a notable emphasis on the incorporation of philosophical foundations in each stage: 1) selection of texts, 2) sampling according to the concept, and 3) internal and interdisciplinary analysis [26]. The outcome of this analysis is a theoretical definition that integrates a scientific understanding of the phenomenon and reconstructs the theoretical form of the concept. The identification of scientific gaps and contradictions augments the analytical power, contributing to the progress of nursing science [21]. The findings derived from the application of principle-based concept analysis hold promise for concept development, underscoring its utility in both the science and practice of nursing. This study seeks to delineate the methodology employed in principle-based concept analysis.

2 | Methods

The execution of the narrative review adhered to the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist [27].

2.1 | Search strategy

This narrative review was conducted by querying PubMed database and Google Scholar search engine, without imposing any temporal constraints. The selection of keywords for the search was based on the utilization of Medical Subject Headings (MeSH) and other specific terms such as "concept analysis", "principle-based concept analysis", and "Penrod & Hupcey".

2.2 | Inclusion and exclusion criteria

The inclusion criteria encompassed articles of various types published in the English language that were pertinent to the title of the article.

2.3 | Study selection

The search process involved the collaborative efforts of two authors. Reference lists derived from eligible studies underwent manual assessment to ensure comprehensiveness and maximize results. The search outcomes were inputted into EndNote X20 software for systematic data management. Redundant studies were systematically excluded. Subsequently, two researchers independently scrutinized the titles, abstracts, and full texts of eligible articles.

3 | Results

3.1 | Study selection

Initially, a total of 907 articles were retrieved through a systematic database search. The screening process involved the examination of titles and abstracts to eliminate any duplicate studies. Subsequently, articles underwent further scrutiny based on their titles and abstracts, resulting in the exclusion of 875 articles. Finally, the full texts of the remaining articles were meticulously reviewed, leading to the identification of 16 articles that explicitly delineated their methodology for principle-based concept analysis. Among these, two articles were authored by individuals from Iran but were presented in the English language. The remaining articles, composed in English, originated from diverse countries. Data extraction for subsequent analysis was performed on this subset of 16 articles (Figure 1).

3.2 | Principles-based concept analysis framework

3.2.1 | Epistemology

Epistemology, a foundational domain within philosophy, pertains to the nature of knowledge [28]. In the context of concept analysis, the epistemological principle accentuates distinctions among concepts within the body of knowledge. A concept attains epistemological maturity when it achieves absolute clarity and

differentiation from other concepts, firmly situating itself within the corpus of textual discourse [20]. This involves delineating the preconditions, attributes, and outcomes that constitute the integral components of the conceptual framework.

3.2.2 | Pragmatic

The pragmatic principle assesses the practical utility of a concept in elucidating or describing nursing phenomena. A concept's practical development is contingent upon its recognition by nurses, who should be able to discern its manifestations in clinical practice [20].

3.2.3 | Linguistics

Linguistics, denoting the scientific study of language and human speech [29], scrutinizes the consistency of a concept's usage and meaning within scientific texts. The assessment extends to the context in which the concept operates and holds significance. For instance, consideration is given to whether the concept's meaning is confined to specific situations (contextually limited) or if it assumes a more abstract and context-independent nature [20].

3.2.4 | Logic

Derived from this philosophical tenet, the principle of logic examines the integration of a concept with other interconnected concepts [29]. Emphasis is placed on the delineation of conceptual boundaries, and the data are analyzed to ascertain whether the clarity of the concept diminishes when theoretically juxtaposed with other related concepts [20].

3.3 | The stages of concept analysis

Concept analysis, founded on guiding principles, delineates the identification of the concept of interest for text selection, sampling in alignment with the concept, and subsequent internal and interdisciplinary analysis [2, 20].

3.3.1 | Selection of articles

Initially, the determination of the concept of interest is crucial for the collection of scientific texts. Factors such as the absence of a clear definition, the presence of ambiguity in the definition, a lack of consensus on the concept, and the inherent complexity and multidimensionality of the concept contribute to the rationale for selecting a concept for analysis [30]. McKenna & Cutcliffe articulate three scenarios influencing concept selection.

In a specific instance, Salehian et al., (2016) undertook an analysis of the concept of "care in nursing education". The authors justified their selection of this concept by highlighting the existence of a broad definition of the concept of care in education,

rendering it challenging to establish a precise and unambiguous definition [31].

Once the desired concept is chosen, the subsequent steps involve the determination of the search strategy (protocol) and the formulation of inclusion and exclusion criteria for the studies [21]. As exemplified in a study by Waldon (2018) [24], which analyzed the concept of "dejection" in the elderly using a principle-based concept analysis, the research encompassed empirical and theoretical scientific research, philosophical scientific works, and evidence-based practice guidelines. The search strategy employed keywords such as "depression", "primary care", "multi-disciplinary team", and "elderly". Inclusion criteria comprised articles written in English, focusing on individuals over 65, reviews/expert reports depicting a conceptual or theoretical framework of frailty, articles concentrating on frailty in primary care, and those discussing immersion as a focal point in a broad context. Exclusion criteria encompassed articles in languages other than English, articles focusing on young people, editorials, articles predating 1990, those centered solely on acute hospitalization, and those emphasizing weakness within the context of a specific illness.

The search for systematic texts is an integral aspect of concept analysis based on principles, incorporating a range of scientific texts, including qualitative, quantitative, and hybrid research, as well as gray literature. Gray literature, encompassing reports, dissertations, conference proceedings, technical specifications and standards, translations, bibliographies, and official documents, among others, is considered valuable [32]. For instance, Nevin et al., (2019) analyzed the concept of "non-specialist palliative care" through principle-based concept analysis. Their search encompassed databases such as CINAHL, PubMed, PsycINFO, Cochrane Library, and Embase, along with additional searches in gray literature databases, key textbooks, national palliative care policies, and websites of chronic disease and palliative care organizations. The study included a total of 124 pieces of evidence, comprising 78 studies from databases and 46 pieces of evidence from gray literature (Figure 1).

Following the concept selection, the subsequent step involves the screening of articles, a process that can adhere to established guidelines such as PRISMA [30]. In the study conducted by Salehian et al., (2016) [31], where they analyzed the concept of "surgical smoke" using the principle-based concept analysis method, the extracted articles underwent modification to suit the analysis of the surgical smoke concept by employing an adapted PRISMA format.

The ongoing screening process necessitates a meticulous review of the textual outcomes, and post-duplicate removal, by two

independent reviewers. Initially, scrutiny is applied to the titles and abstracts of the articles, eliminating those that fail to meet the stipulated entry and exit criteria [33]. At this juncture, the reviewers convene to compare their outcomes. Subsequently, the retained articles undergo a comprehensive full-text review to ascertain adherence to the inclusion criteria. The reviewers once again compare their findings from the review of full-text articles. Manual scrutiny of the resultant article list is performed to ensure alignment with the specified criteria. The reviewers reconvene to discuss and compare their outcomes. In instances where disparate opinions arise, a third reviewer intervenes to make the final determination regarding inclusion [34].

3.3.2 | Sampling according to the concept (qualitative evaluation)

Given that texts serve as the data for analyzing concepts based on principles, the evaluation criteria of adequacy and appropriateness for the target sample assume paramount significance [14]. Adequacy pertains to the extraction of a sample of texts for analysis, particularly when dealing with a substantial volume of material. The assessment of the appropriateness of the existing text sample occurs both during the search process and in the initial examination of the data. Morse's four principles for practical utility assessment are employed in the analysis of the data: Principle 1: Clarify the research purpose; Principle 2: Ensure validity; Principle 3: Identify critical analytical questions; and Principle 4: Synthesize results.

In a study conducted by Patricia Sadlon (2018), which analyzed the concept of the "reflection process" using principles-based concept analysis, the quality of the evidence was assessed based on the following classifications: (1) the general purpose of the article (presence or absence), (2) inclusion of an operational or conceptual definition (presence or absence), (3) connections with theoretical texts (presence or absence), and (4) application of reflective process results to professional practice, with a particular focus on healthcare (presence or absence) [35]. Similarly, in the research by Guraya et al., (2023), which analyzed the concept of "electronic professionalism" using the principles-based concept analysis method, specific commands were employed during data extraction to evaluate the quality of evidence for analysis [36] (Table 1).

3.3.3 | Intra and interdisciplinary analysis

Principle-based concept analysis adopts a multidisciplinary approach, necessitating the analysis of the dataset according to four analytical principles, initially within each disciplinary field and subsequently across fields. The intra-discipline analysis informs

researchers about varying degrees of concept development within different disciplinary perspectives, while interdisciplinary analysis identifies evidence with the potential for integration, fostering a more comprehensive theoretical definition [2, 20]. The selection of interdisciplinary articles should be driven by the concept's potential understanding rather than a predetermined list of interrelated disciplines or conceptual features [20].

In a study conducted by Beecher et al., (2020), employing principles-based concept analysis to analyze the concept of "women's experiences of maternity care", scientific texts from midwifery were explored. Recognizing the multidisciplinary nature of maternity care, texts from related fields such as obstetrics and gynecology, nursing, medicine, psychology, and sociology were also included in the search [37].

Following the inclusion of evidence meeting quality criteria, the researcher proceeds to review these pieces of evidence based on the four principles within a table in the results section. A summary of the four principles is then presented. For instance, in a study by Russell et al., (2013) [22], which analyzed the concept of "intellectual curiosity" using the principle-based concept analysis method, the results indicated that intellectual curiosity relies heavily on implicit or comparative meaning (epistemological principle). The concept lacks a clear definition, and there is robust evidence suggesting its practical utility in nursing education (practical principle). Moreover, intellectual curiosity exhibits diverse uses and inconsistencies in meaning in scientific texts (linguistic principle), and there is a notable absence of theoretical integrity in the concept (logical principle).

Subsequently, the data derived from the principles' analysis are further scrutinized based on conceptual components. Although not explicitly included in the primary guidelines of Penrod & Hupcey (2005) [2], conceptual components have been subsequently utilized in principle-based concept analysis [38, 39]. The exploration of conceptual components involves examining preconditions (factors preceding the occurrence of the concept), properties/attributes (common expressions describing experiences related to the concept), and outcomes (consequences following the occurrence of the concept). Ultimately, a theoretical definition is formulated.

In a study by Eppel-Meichlinger et al., (2022), which aimed to establish a theoretical definition of the concept of "self-organization" in the context of uncertainty in chronic disease, conceptual components, including antecedents, promotion factors, characteristics, and consequences of self-organization, were presented. A theoretical model of self-organization was subsequently proposed [40] (Figure 2).

- **Antecedents:** Mental instability stemming from progressive illness, escalating deterioration conditions, feelings of despair, and uncertainty.
- **Promoting Factors:** Temporal aspects, resilience, social support, reduced treatment-related side effects, and diminished preoccupation with the disease.
- **Characteristics:** Transition between psychological instability and regulation, a process of psychological adjustment, cognitive reframing, a latent and continuously evolving nature.
- **Outcome:** Psychological adjustment evident through expanded awareness, heightened self-confidence and courage, a newfound sense of control, empowerment, increased quality of life, and resistance to caregiving from the perspective of the caregiver or recipient of care.

Deliberate actions undertaken by caregivers were considered meaningful responses to environmental threats, such as challenges or difficulties in expressing needs, objections, rejection, or unwillingness to accept the caregiver-recipient relationship. Factors contributing to resistance to care encompassed distorted understanding (e.g., cognitive impairment and immature cognitive development), dependence on another for care (e.g., physical or psychological limitations), anxiety, apprehension, or unmet physical or psychosocial needs. The consequences of resistance to care included interrupted caregiving, the use of force, physical or medical constraints on care provision, heightened distress, discomfort for both caregiver and recipient and an escalation of destructive behaviors exhibited by the care recipient toward the caregiver.

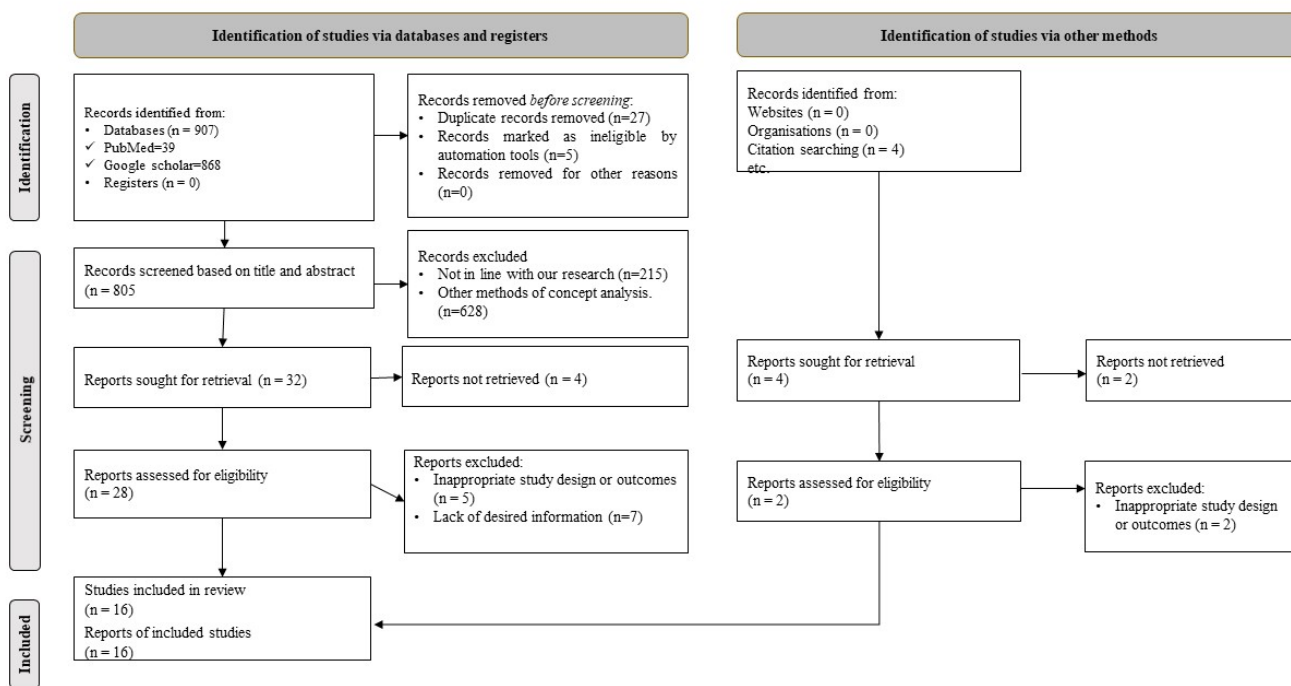


Figure 1. Flow diagram of the study selection process.

5 | Conclusions

The outcomes of a concept analysis are essential for researchers aiming to discern and pursue avenues for the development of the examined concept. In the context of principle-based concept analysis, each guiding principle facilitates an understanding of the strengths and limitations inherent in the current state of the concept within the scientific literature. The culmination of a principle-based concept analysis is a theoretical definition that encapsulates the scientific status of the targeted concept. This theoretical definition undergoes scrutiny based on the four principles of epistemology, pragmatism, linguistics, and logic. It is imperative to note that this definition is evidence-based, relying on information extracted from scientific literature and not from general media, artistic expressions, or other non-academic sources. The theoretical definition resulting from this systematic process contributes to the reconstruction of the theoretical framework associated with the concept. By integrating knowledge gleaned from

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the existing scientific landscape, concept analysis not only elucidates the current state of the concept but also propels concept development methodologies toward theoretical advancement.

Table 1. Commands used in data extraction to assess the quality of evidence.

Questions	Principles
<ul style="list-style-type: none"> • What are the definitions and elements of the definition of electronic professionalism in medical education? • Is e-professionalism well differentiated from other related concepts? • What are the other related concepts mentioned? 	Epistemic
<ul style="list-style-type: none"> • What is the application of e-professionalism in clinical/academic practice? • What are the applications of research? • How has electronic professionalism been operationalized? 	Pragmatist
<ul style="list-style-type: none"> • What is linguistic compatibility around e-professionalism? • What is language maturity and appropriateness in context? 	Related to linguistics
<ul style="list-style-type: none"> • Does e-professionalism as a concept have clear boundaries? • What is the evidence for the integration of e-professionalism from theoretical perspectives? • Is this concept properly operationalized? • What are the key features of electronic professionalism? • What is the evidence of consistent use of those key features? 	Logic



Figure 2. A theoretical model of self-organization.

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Authors' contributions

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: MK, HK; Drafting the work or revising it critically for important intellectual content: MK, HK; Final approval of the version to be published: MK, HK; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or

integrity of any part of the work are appropriately investigated and resolved: MK, HK.

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Ethics approval and consent to participate

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Competing interests

We do not have potential conflicts of interest with respect to the research, authorship, and publication of this article.

Availability of data and materials

The datasets used during the current study are available from the corresponding author on request.

Using artificial intelligent chatbots

None.

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