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A CONCEPT ANALYSIS: TENACITY OF POST-STROKE PATIENTS IN REHABILITATION PROGRAMS

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Abstrak

Stroke merupakan masalah kesehatan global yang besar, dengan rehabilitasi yang menawarkan manfaat yang signifikan. Akan tetapi, kepatuhan sering kali terganggu. Keuletan, yang didefinisikan sebagai kegigihan dan tekad, sangat penting untuk rehabilitasi yang efektif tetapi sering kali diabaikan dan dievaluasi dengan buruk dalam pengaturan klinis. Analisis ini bertujuan untuk memperjelas konsep keuletan dalam rehabilitasi pasca-stroke dan menilai dampaknya terhadap hasil. Kerangka kerja delapan langkah Walker dan Avant digunakan untuk memeriksa keuletan, dengan mengambil data dari literatur rehabilitasi stroke yang relevan. Analisis tersebut mengungkapkan bahwa keuletan memiliki beberapa atribut utama, termasuk kemampuan beradaptasi, motivasi diri, tekad, ketekunan, ketahanan, dan kegigihan. Anteseden keuletan mencakup faktor-faktor seperti tujuan pribadi, strategi penanggulangan, status fisik dan psikologis, usia, lingkungan yang mendukung, dan sistem pendukung yang kuat. Keuletan adalah kunci dalam rehabilitasi pasca-stroke, meningkatkan keterlibatan terapi, kualitas hidup, kemandirian, dan mengurangi komplikasi sekaligus mencegah kemunduran dan mendorong pemulihan jangka panjang. Pemahaman yang lebih baik tentang keuletan dapat membantu profesional perawatan kesehatan dalam merancang intervensi yang lebih efektif untuk mendukung pasien dalam program rehabilitasi mereka. Penelitian lebih lanjut diperlukan untuk mengembangkan alat yang valid dan andal untuk menilai keuletan dan mengevaluasi intervensi yang dapat meningkatkan keuletan pasien.

Abstract

Stroke is a major global health issue, with rehabilitation offering significant benefits. However, adherence is often compromised. Tenacity, defined by persistence and determination, is essential for effective rehabilitation but is often overlooked and poorly evaluated in clinical settings. This analysis aims to clarify the concept of tenacity in post-stroke rehabilitation and assess its impact on outcomes. Walker and Avant's eight-step framework is used to examine tenacity, drawing data from relevant stroke rehabilitation literature. The analysis reveals that tenacity has several key attributes, including adaptability, self-motivation, determination, perseverance, resilience, and persistence. Antecedents of tenacity include factors such as personal goals, coping strategies, physical and psychological status, age, supportive environment and strong support system. Tenacity is key in post-stroke rehabilitation, enhancing therapy engagement, quality of life, independence, and reducing complications while preventing setbacks and promoting long-term recovery. A better understanding of tenacity can aid healthcare professionals in designing more effective interventions to support patients in their rehabilitation programs. Further research is needed to develop valid and reliable tools for assessing tenacity and to evaluate interventions that can enhance patient tenacity.

***Keyword**: Patient Post-Stroke, Rehabilitation, Tenacity*

Introduction

Stroke significantly affects global health, serving as the primary cause of both death and disability worldwide. In 2019, it was the third most common major disease and the fifth leading cause of death globally (Abbafati et al., 2020; World Health Organization, 2019). Affecting over 80 million people, stroke remains a common and disabling condition (Duncan et al.,

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2021). Around 70% of all strokes are acute ischemic strokes (AIS), with more than one-third of AIS patients either dying or becoming disabled within three months to a year (Li et al., 2023). This issue can be addressed through the implementation of rehabilitative programs.

The success rates of rehabilitation programs for post-stroke patients are typically high, with a considerable proportion of patients demonstrating notable improvements in functional ability (60-70%), cognitive function (50-60%), and quality of life (60-70%) (Baltaduoniene et al., 2019; Bindawas & Vennu, 2016a; Khanna et al., 2022). Despite advances in acute management, many stroke survivors face significant challenges in regaining motor function, necessitating comprehensive rehabilitation programs. Patient adherence to post-stroke rehabilitation programs can be affected by various factors, including demographics, stroke severity and location, comorbidities, rehabilitation goals, patient motivation and involvement, access to transportation and healthcare services, and the level of social support and caregiver involvement (Lu, 2024; Tabah et al., 2020). Despite the numerous factors that may impede a patient's ability to adhere to a rehabilitation program, those who demonstrate tenacity in pursuing their rehabilitation are more likely to complete the program successfully.

The concept of tenacity defined as the persistence and determination to reach goals despite obstacles has become essential for post-stroke patients to successfully complete their rehabilitation programs. Nurses must continually assess this, as tenacity is the cornerstone of post-stroke rehabilitation. It is the driving force that propels patients towards recovery and transforms challenges into opportunities (Lu, 2024; Visser, 2016).

Regrettably, few nurses recognize the importance of tenacity in post-stroke patients undergoing rehabilitation, as indicated by the high dropout rates, lack of assessments on patient tenacity, and limited research on the topic. This study seeks to investigate the concept of tenacity in post-stroke patients involved in rehabilitation programs.

Methods

This research aims to define the concept of tenacity in nursing, specifically in stroke patients undergoing rehabilitation. The study employs Walker and Avant (2019) eight-step concept analysis method, including selecting a concept, determine the aims, identify all uses, determine the defining attributes, identify a model case, identify borderline, related, and contrary cases, identify antecedents and consequences, and define empirical referents. A Google Scholar search using the keyword "tenacity of post-stroke patients in rehabilitation" identified 156 articles. Of these, only four met the inclusion criteria: they defined tenacity in post-stroke rehabilitation, were published between 2014 and 2024, and were available in English. These four articles were analyzed to identify key attributes. Outlines the attributes of tenacity using the eight-step concept analysis method developed by Walker and Avant (2019), as presented in Table 1.

Table 1. Walker and Avant's eight-step concept analysis

Concept analysis steps	Arrangements for presentation
1. Select a concept	Introduction
2. Determine the aims of the analysis	Methods
3. Identify all uses of the concept	Result
4. Determine the defining attributes	Result
5. Construct a model case	Result
6. Construct an additional case	Result

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Concept analysis steps	Arrangements for presentation
7. Identify antecedents and consequences	Result
8. Define empirical referents	Result

Results and Discussion

Historical origins and modern definitions of tenacity

The term "tenacity" has been in use since the early 1500s, with its first recorded use in 1526. Derived from the Latin (1) tenacitas, “an act of holding fast”, (2) from tenax (genitive tenacis) "holding fast, gripping, clingy; firm, steadfast" (3) from tenere "to hold". It means persisting despite obstacles. It is linked to perseverance, persistence, and determination, making it a valuable trait for achieving goals and overcoming challenges. The tenacity that accompanies conviction entails a stubborn persistence and an unwillingness to concede defeat (*Tenacity Definition & Meaning - Merriam-Webster*, n.d.). Tenacity refers to the capacity to persist through adversity and sustain effort toward a goal despite encountering setbacks. (Tenacity | Definition in the Cambridge English Dictionary, n.d.). Similar to the prior definition, tenacity is characterized by persistent determination. It denotes the capacity to persist in pursuing a goal or overcoming challenges, even in the face of obstacles or lack of immediate success (Tenacity Definition and Meaning | Collins English Dictionary, n.d.).

Literature and theoretical frameworks

Tenacity based on Pierce’s Theory

There isn't a comprehensive theory of tenacity, but Peirce's Method of Tenacity is a notable framework that addresses it. Pierce (1877) discussed tenacity in his work, describing it as the unwavering commitment to one's beliefs despite opposing evidence. His "Method of Tenacity" offers certainty by clinging to convictions, but it is limited by social influence and differing perspectives. This contrasts with the scientific method, which relies on empirical evidence to shape and revise beliefs.

Though seemingly conflicting, tenacity and openness can coexist. Tenacity is vital in decision-making, metaphysics, and hypothesis development, while openness ensures responsiveness to evidence. Balancing both is crucial for scientific progress (Dorato, 2009).

Over time, Peirce’s concept has been expanded into various fields, including psychology, education, and healthcare, where tenacity is seen as crucial for overcoming challenges and achieving success (Aka & Çalik, 2018; Buss et al., 2020; Gemayel et al., 2011; Thompson, 2023; Yoo et al., 2022; Zeng & Ouyang, 2020). Modern tenacity emphasizes adaptability, self motivation, resilience, determination, perseverance, and persistence moving beyond Peirce’s focus on maintaining belief. It now highlights sustained effort and flexibility in achieving goals, essential for navigating challenges.

Tenacity in the nursing discipline

Tenacity, a quality characterized by persistence and determination, is a crucial aspect of nursing practice. In the context of nursing, tenacity is not explicitly defined as a specific theory but is embedded in various nursing theories and practices.

Jean Watson's Theory of Human Caring stresses the need for tenacity in building compassionate nurse-patient relationships. Afaf Ibrahim Meleis's Transitions Theory highlights tenacity in supporting healthy transitions for patients and communities. Nola Pender's Health Promotion Model and Madeleine M. Leininger's Transcultural

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Nursing Theory both require tenacity in promoting health and adapting to diverse cultural contexts. Together, these theories show how crucial tenacity is for effective nursing, strengthening patient relationships and enhancing well-being.

One of tenacity significant roles pertains to the rehabilitation of post-stroke patients, it enables them to successfully navigate the complex and demanding rehabilitation process, which ultimately leads to improved physical, emotional, and social outcomes. Intensive rehabilitation, fueled by tenacity, significantly improves long-term results, enhancing independence in daily activities and overall quality of life (Yoo et al., 2022). Nurses must consistently evaluate and nurture this tenacity, as it is fundamental to successful rehabilitation, particularly for post-stroke patients. It drives patients toward recovery, turning challenges into opportunities and maximizing their potential for recovery and well-being (Lu, 2024; Visser, 2016).

Determine the defining attributes

Walker and Avant (2019) described attributes as traits that consistently appear within a concept, aiding researchers in distinguishing a particular phenomenon from others that may seem similar. Insights from four key sources led to the identification of six attributes associated with tenacity, as presented in Table 2.

Table 1. Literature support the attributes

Attributes	Sources
1. Adaptability: The capacity to modify and refine strategies in response to challenges.	(Fang et al., 2022); (Lo Buono et al., 2015)
2. Self motivation: The driving force that propels individuals to achieve their goals is fueled by a strong sense of purpose and inner drive.	(Fang et al., 2022); (Lo Buono et al., 2015)
3. Determination: A robust aspiration for success is driven by a discernible objective, unfaltering dedication, and an inclination to invest the requisite effort and exertion.	(Sun et al., 2024); (Fang et al., 2022); (Liu et al., 2020)
4. Resilience: The capacity to rebound from adversity, failures, and setbacks with renewed energy and determination, to adapt to change, and to learn from experiences in order to maintain momentum towards goals.	(Sun et al., 2024); (Fang et al., 2022); (Liu et al., 2020), (Lo Buono et al., 2015)
5. Perseverance: The unwavering dedication to pursue a goal through perseverance in the face of adversity and setbacks.	(Sun et al., 2024); (Liu et al., 2020), (Lo Buono et al., 2015)
6. Persistence: The ability to overcome challenges hinges on three key factors: a resolute dedication to achieving desired outcome, a willingness to persevere through an adversity, and the capacity to learn from setbacks.	(Fang et al., 2022); (Liu et al., 2020)

These traits form a strong framework for tenacity in post-stroke rehabilitation. Tenacity, essential for success is supported by adaptability (Fang et al., 2022; Lo Buono et al., 2015), self-motivation (Fang et al., 2022; Lo Buono et al., 2015), determination (Fang et al., 2022; Liu et al., 2020; Sun et al., 2024), perseverance (Liu et al., 2020; Lo

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Buono et al., 2015; Sun et al., 2024), resilience (Fang et al., 2022; Liu et al., 2020; Lo Buono et al., 2015; Sun et al., 2024), and persistence (Fang et al., 2022; Liu et al., 2020), leading to better engagement and recovery outcomes.

Construct model case

Model case

"Burhan, a 58-year-old stroke survivor, faced significant motor, speech, and cognitive impairments. Prior to the stroke, he was active in hiking and tennis. Rehabilitation started within 48 hours with a multidisciplinary team focused on stabilizing his condition and preventing muscle atrophy. Burhan showed remarkable adaptability by learning to use his non-dominant hand and new communication methods. His self-motivation was evident through setting small goals and tracking progress in a journal. Despite slow progress, his determination and persistence kept him engaged in therapy. His resilience was tested by emotional challenges, but with psychological support and family encouragement, he developed effective coping strategies. Burhan's perseverance in consistent, targeted exercises led to significant improvements, including partial recovery of motor skills, better speech, and cognitive enhancement. Although he couldn't return to all his previous activities, he found new ways to stay active through adaptive sports and volunteering".

Borderline Case

Borderline cases involve attributes that are associated with the concept but are frequently confused with it (Walker & Avant, 2019). This case study underscores how tenacity is vital for late-stage recovery in post-stroke rehabilitation, demonstrating how strong determination can lead to significant progress despite major challenges and long recovery periods.

"Anto, who experienced a severe stroke resulting in complete upper limb paralysis, embarked on an extended rehabilitation journey far beyond typical recovery times. Despite a grim prognosis, Anto showed exceptional tenacity, developing new skills and strategies to compensate for paralysis. His self-motivation and desire for independence drove him through slow progress and psychological challenges. Over more than a decade, Anto's resilience and persistence were key to his success, ultimately achieving significant motor recovery of the upper limb. This case study highlights the profound impact of tenacity on post-stroke rehabilitation outcomes".

Related Case

Related cases are instances of concepts that are related to the concept being studied but that do not contain all the defining attributes. This case study shows how tenacity greatly impacts post-stroke rehabilitation, illustrating its potential to drive substantial functional gains and improve quality of life for stroke survivors.

"Tini, a 38-year-old nurse and mother of two, suffered a severe stroke causing partial paralysis, speech, and cognitive impairments. The sudden shift from an active life to struggling with basic tasks was deeply distressing. Despite significant challenges, Tini's determination to recover for her family drove her progress. She set small, achievable goals and maintained relentless effort, demonstrating resilience by viewing adversity as an opportunity for growth. Supported by her family and healthcare team, Tini's perseverance in a rigorous rehabilitation program, including physical, occupational, and speech therapy, led to marked improvements in mobility and communication. Over time, she regained

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much of her independence and returned to nursing part-time, a milestone that brought her pride and renewed purpose".

Contrary Case

Contrary cases are examples that are clearly not concepts or that contradict the notion of concepts. This case study highlights how crucial tenacity is in post-stroke rehabilitation. Without key traits like adaptability, self-motivation, determination, resilience, perseverance, and persistence, recovery can be hindered, underscoring the need for targeted interventions to boost these attributes and improve rehabilitation outcomes.

"Hamid, a 55-year-old male, suffered a moderate stroke causing motor impairments and speech difficulties. Despite being enrolled in a rehabilitation program, his lack of tenacity hindered progress. He was reluctant to use new techniques and adaptive equipment, lacked motivation, and frequently missed therapy sessions. Hamid's inconsistent practice, discouragement from slow progress, and inability to cope with setbacks led to minimal improvement in his motor skills and speech. His lack of long-term commitment to rehabilitation resulted in a significantly diminished quality of life."

Antecendents

Antecedents are conditions or events that precede a concept and contribute to its emergence, helping to clarify and refine it (Walker & Avant, 2019). In post-stroke rehabilitation, predictors of tenacity include a supportive environment, personal goals, positive reinforcement, a strong support system, coping strategies, physical and psychological support. Additional factors, such as age, stroke subtype, nutritional status, psychosocial aspects, functional status at admission, and post-stroke complications, also play a role. Enhancing tenacity is vital for optimizing recovery. Healthcare professionals can boost patient motivation by focusing on these predictors, teaching coping strategies, and providing psychological support tailored to each patient's needs. These initiatives cultivate resilience and determination, enhancing tenacity and ultimately leading to improved rehabilitation outcomes and a better quality of life for post-stroke patients (Albers et al., 2018; Gangwani et al., 2022;Verrienti et al., 2023; Yoshida et al., 2023).

Consequences

Tenacity is crucial in post-stroke rehabilitation, driving recovery by fostering adaptability, self-motivation, determination, resilience, perseverance, and persistence. It enchances engagement in therapy, improved quality of life, boosts independence, and minimizes complications, resulting in improved functional, cognitive, and emotional outcomes. By preventing setbacks and maintaining progress, tenacity plays a crucial role in maximizing rehabilitation efforts and promoting long-term recovery. (A Team Approach to Stoke Recovery - Mayo Clinic Health System, n.d.; Stroke Rehabilitation: What to Expect as You Recover - Mayo Clinic, n.d.-b; Grefkes et al., 2020; Handayani et al., 2024; Kurosaki et al., 2022; Matérne et al., 2022; B. Neibling et al., 2024; Verrienti et al., 2023b).

Define empirical referents

Empirical referents are observable attributes that indicate the presence of a concept, particularly when the concept is abstract and challenging to measure. They help in identifying and measuring the concept (Walker & Avant, 2011).

Adaptability in stroke survivors is assessed by their ability to adjust rehabilitation goals and strategies. Self-motivation is measured with the Intrinsic Motivation Inventory

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(IMI), which evaluates interest and consistency in therapy. Determination is reflected in goal attainment and commitment to exercise. Resilience is assessed by recovery from setbacks and emotional management. Perseverance is tracked through long-term participation, and persistence is measured by continued effort despite challenges.

Empirical referents of tenacity in post-stroke rehabilitation are measurable indicators of key attributes like adaptability, self-motivation, determination, resilience, perseverance, and persistence. They help quantify the impact of tenacity and guide the customization of rehabilitation programs for stroke survivors (Balasubramanian et al., 2014; Chen et al., 2007; Development and Validation of a Resilience Questionnaire for Patients During Stroke Rehabilitation in China | Article | NursingCenter, n.d.; Gangwani et al., 2022; Geerse et al., 2021; Neibling et al., 2021; Verrienti et al., 2023; Yan & Lin, 2022).

Figure 1. Ilustrates the concept of tenacity and its attributes within the context of post-stroke rehabilitation. It identifies key antecedents that contribute to tenacity, including personal goals, coping strategies, physical and psychological status, a supportive environment, and a strong support system. These factors foster essential attributes such as adaptability, persistence, self-motivation, resilience, determination, and perseverance. The consequences of enhanced tenacity include increased engagement in rehabilitation programs, improved quality of life, greater independence, and reduced complications, all of which contribute to more effective recovery outcomes for post-stroke patients.

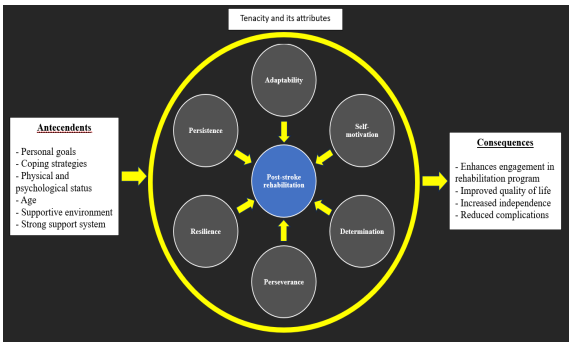

Figure 1. Conceptual Model of Tenacity for Post-Stroke Patient Undergoing Rehabilitation

Implication

This study emphasizes the critical role of tenacity in post-stroke rehabilitation, suggesting that nurses must actively foster this trait to enhance patient outcomes. By incorporating strategies such as setting realistic goals, providing consistent encouragement, and offering emotional support, nurses can help sustain patient motivation and perseverance. Integrating family and caregivers into the rehabilitation process further strengthens the patient's support system, ensuring a comprehensive approach to recovery. Regular assessments of tenacity should guide personalized interventions, aiming to balance persistence with realistic expectations to prevent burnout and maximize rehabilitation success.

Limitation

A potential limitation of the article is the relatively small number of studies analyzed to define the concept of tenacity in post-stroke rehabilitation. The research relies on only four articles that met the inclusion criteria, which may not fully capture the diversity and complexity of tenacity across different contexts, patient populations, or cultural settings. This limited sample size could restrict the generalizability of the findings, and the attributes identified may not encompass all relevant aspects of

tenacity. Additionally, the narrow focus on English-language articles published within a specific timeframe may have excluded valuable perspectives from non-English studies or older research, potentially affecting the comprehensiveness of the concept analysis.

Conclusion

Tenacity defined by traits such as adaptability, self-motivation, determination, resilience, perseverance, and persistence, is crucial for achieving successful outcomes in post-stroke rehabilitation. This study emphasizes the vital role of nursing interventions in cultivating tenacity among stroke survivors, illustrating how this attribute significantly enhances the recovery process. Integrating tenacity with conventional medical care allows nurses to significantly enhance both functional recovery and quality of life. Prioritizing tenacity strengthens therapeutic effectiveness and ensures patient-centered care, addressing individual psychological and emotional needs. Moving forward, future research should focus on developing standardized methods for assessing and enhancing tenacity. This will help create more effective, personalized rehabilitation programs, ultimately improving long-term recovery outcomes for stroke survivors.

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