



Developing Nursing Frameworks for Managing Long COVID: Integrating Theoretical Models for Holistic, Patient-Centered, and Interdisciplinary Care

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Abstract

Background:

Long COVID, defined by the persistence of symptoms following acute COVID-19 infection, has emerged as a significant public health concern. Patients often report a wide array of physical, cognitive, and psychological symptoms, such as fatigue, breathlessness, cognitive dysfunction (brain fog), and depression. Although awareness of long COVID is increasing, there is still a lack of structured, evidence-based strategies for addressing these complex and varied symptoms. Nursing interventions, underpinned by solid theoretical models, offer a promising solution to address these intricate care needs.

Aim:

This paper seeks to propose nursing frameworks rooted in theoretical models to manage the symptoms of long COVID, incorporating biopsychosocial, patient-centered, and multidisciplinary care principles aimed at improving health outcomes and quality of life.

Methods:

The study conducts a thorough review of existing nursing theories and frameworks applicable to chronic illness management. A qualitative synthesis of patient-reported outcomes and case studies is performed to identify the distinct care requirements of long COVID patients. Based on these findings, theoretical frameworks are modified and developed to guide nursing practice effectively.

Results:

The findings emphasize the multifaceted nature of long COVID symptoms and the importance of adopting holistic, patient-centered care approaches. The proposed frameworks include models for adaptive self-care, strategies focusing on resilience, and fostering interdisciplinary collaboration. Each framework is designed

to tackle specific challenges, such as managing physical symptoms, promoting psychological well-being, and ensuring continuity of care.

Conclusion:

The proposed nursing frameworks provide a systematic approach to managing long COVID symptoms, highlighting patient empowerment, resilience-building, and collaborative care. These frameworks offer practical guidance for integrating nursing interventions into long COVID management and stress the importance of continued research and policy development to support these efforts.

Keywords:

Long COVID, nursing frameworks, chronic illness management, patient-centered care, resilience, interdisciplinary care, theoretical models.

Received: 05 October 2023 **Revised:** 19 November 2023 **Accepted:** 02 December 2023

Introduction

Long COVID, also referred to as post-acute sequelae of SARS-CoV-2 infection (PASC), is marked by a range of symptoms that persist beyond the acute phase of COVID-19. These symptoms, which include physical issues such as fatigue and breathlessness, as well as cognitive challenges like brain fog, can linger for weeks or months, significantly affecting patients' quality of life and functional abilities. Although long COVID is a relatively new phenomenon, it has been recognized as a complex public health concern requiring specialized attention. The World Health Organization (WHO) defines long COVID as a condition that occurs in individuals with a history of probable or confirmed SARS-CoV-2 infection, typically three months after the onset of COVID-19, with symptoms lasting for at least two months and not attributable to another diagnosis. This broad definition emphasizes the multifaceted nature of the condition and highlights the need for innovative management frameworks.

Significance:

Managing long COVID symptoms (fig 1) is critical both for individual health and healthcare systems. For individuals, long COVID negatively impacts physical, psychological, and social well-being, reflecting patterns seen in chronic conditions like myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS). For healthcare systems, it presents challenges in resource allocation, worsened by its widespread occurrence and the lack of standardized treatment protocols. Theoretical models like Orem's Self-Care Deficit Nursing Theory and the Neuman Systems Model offer valuable insights for structuring nursing interventions in chronic, multifactorial conditions [1, 2, 3]. These frameworks emphasize individual agency, resilience, and comprehensive care, all of which are essential for managing long COVID.

Recent Developments:

Recent studies, published between 2020 and 2022, highlight the growing recognition of long COVID as a chronic condition that requires integration into broader chronic disease management strategies [4]. Evidence also suggests that personalized nursing interventions, which consider the biopsychosocial aspects of care, significantly improve patient outcomes [5]. Furthermore, interdisciplinary collaboration has emerged as a key component of effective long COVID management, with nurses playing vital roles in coordinating care across various specialties [6].

This paper is divided into several sections to systematically address the topic. The first section reviews the foundations of nursing care for long COVID, drawing from existing theoretical models and frameworks. The second section presents new nursing frameworks developed to address the specific challenges of long COVID. The third section discusses the practical application of these frameworks, focusing on implementation strategies and anticipated outcomes. Finally, the conclusion summarizes the main findings, discusses their implications for nursing practice, and identifies areas for further research.

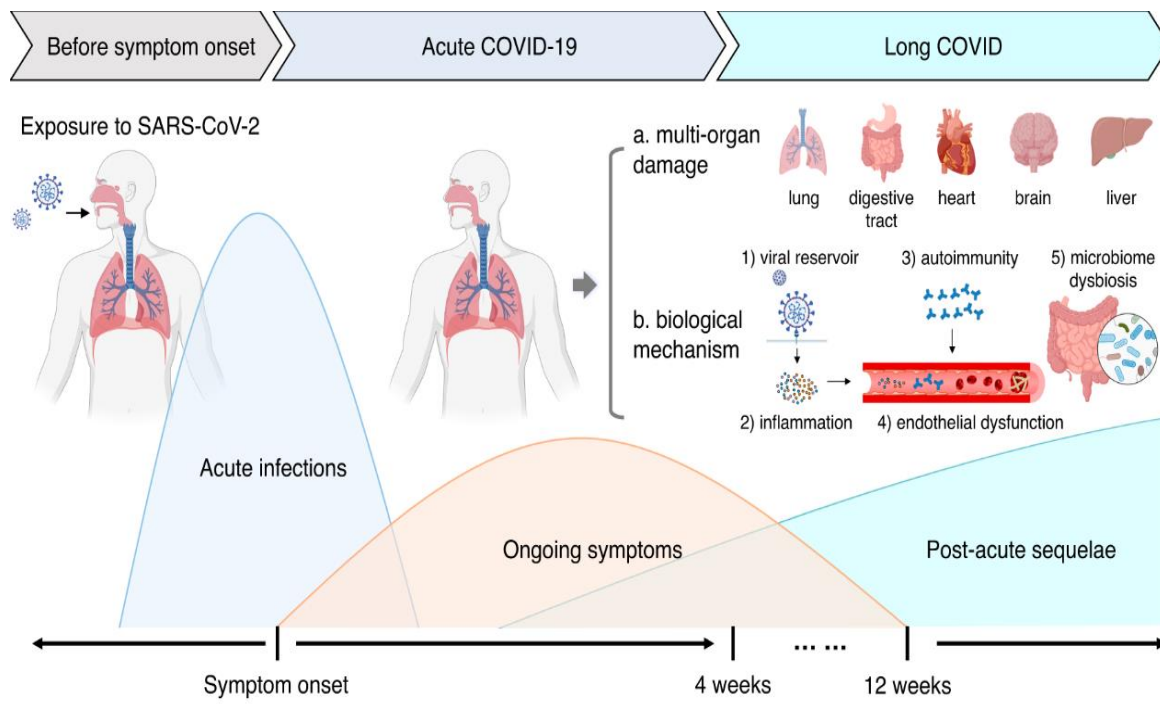


Figure 1 COVID symptoms

Foundations for Long COVID Care

Managing long COVID effectively requires a strong foundation that integrates holistic care principles with theoretical nursing frameworks to address the multifaceted needs of patients. This section explores three essential dimensions: the biopsychosocial model, existing nursing theories, and patient-centered care principles. Together, these components form a comprehensive basis for structuring nursing interventions that address the physical, psychological, and social aspects of long COVID, while also promoting patient empowerment and resilience.

Biopsychosocial Model in Nursing:

The biopsychosocial model, introduced by George Engel, highlights the interconnectedness of biological, psychological, and social factors in health and illness [7]. Applied to long COVID, this model offers a valuable framework for understanding the complex symptomatology that extends beyond traditional medical paradigms. Symptoms of long COVID, such as persistent fatigue, cognitive impairments, and psychological distress, are often influenced by social factors, including employment, healthcare access, and support networks [8, 9]. Nurses, as holistic caregivers, are ideally positioned to implement this model by coordinating care that addresses all three dimensions.

In the context of long COVID, nurses play a crucial role in ensuring comprehensive assessments and interventions. Physical symptoms, like dyspnea or post-exertional malaise, require individualized care plans that balance activity and rest. Psychological symptoms, such as anxiety and depression, necessitate collaboration with mental health professionals for counseling and cognitive-behavioral therapy. Social challenges, including reintegration into the workplace, require advocacy for accommodations and access to community resources [10, 11]. By systematically incorporating these dimensions, the biopsychosocial model ensures continuity of care and enhances outcomes for long COVID patients.

Existing Nursing Theories:

Integrating established nursing theories into long COVID care provides a structured and theoretical foundation for effective nursing practice. Two key theories, Orem's Self-Care Deficit Nursing Theory and the Neuman Systems Model, are particularly relevant in addressing the unique challenges posed by long COVID.

Orem's Self-Care Deficit Nursing Theory:

Orem's Self-Care Deficit Nursing Theory, which focuses on enabling patients to meet their self-care needs when they cannot do so independently, is highly applicable to long COVID patients [12]. Many individuals with long COVID experience significant functional limitations, such as chronic fatigue and cognitive dysfunction, which hinder their ability to perform daily self-care activities. Nurses applying this theory can assess patients' self-care deficits, create interventions to address these gaps, and support the gradual restoration of independence. For instance, patients struggling with energy management can benefit from nurse-led education on pacing and prioritizing tasks, alongside structured plans to regain autonomy over time [13, 14].

Neuman Systems Model

The Neuman Systems Model, which focuses on managing stressors that affect an individual's system, is well-suited to address the multidimensional stressors faced by long COVID patients [15]. These stressors can include physical challenges, emotional strain, and social disruptions. This model offers a structured approach for nurses to identify and alleviate these stressors using primary, secondary, and tertiary prevention strategies. For example, primary prevention might involve patient education on managing triggers for post-exertional malaise, while secondary prevention could focus on early interventions for depressive symptoms [16]. Tertiary prevention strategies could include rehabilitation programs to address long-term functional impairments. The flexibility of this framework makes it especially relevant for the dynamic and evolving nature of long COVID.

Patient-Centered Care Principles:

Patient-centered care is a fundamental principle in modern healthcare and is crucial for managing long COVID, given the variability in symptom presentation and individual patient needs. This approach emphasizes collaboration between healthcare providers and patients to set shared goals and improve outcomes [17].

Involving Patients in Goal Setting and Care Planning:

Long COVID patients often experience uncertainty and frustration due to the unpredictable course of their condition. Engaging patients in goal setting allows them to take an active role in their care, promoting a sense of control and involvement [18]. Nurses can facilitate this process by conducting thorough discussions to understand the patient's priorities and tailoring interventions to align with their values and preferences. For instance, a patient struggling with severe fatigue might prioritize energy conservation strategies, while another might focus on enhancing cognitive function through targeted mental exercises [19, 20].

Enhancing Patient Autonomy and Adherence to Care:

Promoting patient autonomy is a key aspect of patient-centered care. Nurses can support this by providing patients with education, tools, and resources that help them manage their symptoms effectively. Digital health tools, such as symptom tracking apps, can empower patients to monitor their progress and adjust their care plans accordingly [21]. Moreover, cultivating a collaborative relationship between the patient and care provider improves adherence to treatment plans. Research shows that patients who feel listened to and respected by their healthcare providers are more likely to follow prescribed treatments and report higher satisfaction with their care [22, 23].

Proposed Theoretical Frameworks

The complexity of long COVID requires the integration of theoretical frameworks to guide and structure effective nursing care. This section introduces three proposed frameworks specifically designed to manage long COVID symptoms. Each framework is rooted in established nursing theories and evidence-based practices, offering strategies to address the unique challenges faced by both patients and healthcare

providers. These frameworks include the Adaptive Self-Care Framework, Resilience-Oriented Care Framework, and Multidisciplinary Care Collaboration Framework.

Adaptive Self-Care for Long COVID

Long COVID, also referred to as post-acute sequelae of SARS-CoV-2 infection (PASC), is a condition that impacts a growing number of individuals long after they have recovered from the initial COVID-19 infection. While the acute phase of COVID-19 usually resolves within a few weeks, long COVID can persist for months or even longer, leaving individuals with a variety of lingering symptoms. These symptoms, which can range from fatigue and brain fog to joint pain and respiratory issues, can significantly disrupt daily life and impact a person's overall well-being. As the medical community continues to study the condition, it has become increasingly clear that managing long COVID requires not only medical interventions but also adaptive self-care strategies that cater to the specific needs and challenges of those affected.

Adaptive self-care is an approach that encourages individuals to take an active role in managing their condition through personalized strategies that are flexible and responsive to their evolving symptoms. Given the wide variety of symptoms and the unique nature of long COVID in each individual, these self-care practices must be tailored to each person's situation. By embracing adaptive self-care, individuals can not only manage their symptoms more effectively but also improve their quality of life during a difficult period of recovery. This document explores key adaptive self-care strategies that can help people living with long COVID regain control over their health and enhance their well-being.

To begin with, pacing and energy management are some of the most important aspects of adaptive self-care for long COVID. Fatigue is one of the most prevalent and debilitating symptoms of the condition, making it essential for individuals to manage their energy levels carefully. One of the most effective techniques for this is pacing, which involves balancing periods of activity with rest to avoid overexertion. Pacing helps prevent the worsening of symptoms and allows the body time to recover between tasks. People with long COVID may find it helpful to break tasks into smaller, more manageable steps to avoid feeling overwhelmed. Scheduling regular breaks throughout the day is another key strategy, ensuring that individuals have ample time to rest and recharge. It is also important to prioritize essential activities and be willing to let go of non-essential tasks, understanding that it's okay to not be as productive as before. In some cases, individuals may need to reassess their expectations and redefine what is achievable on a given day, allowing themselves the space to recover at their own pace.

In addition to pacing, mindfulness and stress reduction techniques can play a significant role in managing the mental and emotional challenges that often accompany long COVID. Brain fog, anxiety, and depression are common psychological symptoms of long COVID, and these can exacerbate physical symptoms and create a sense of overwhelm. Mindfulness practices, such as meditation and deep breathing exercises, can be very effective for reducing stress, improving focus, and promoting emotional well-being. For some, engaging in gentle yoga or stretching routines can help to release tension in the body and improve mental clarity. Additionally, hobbies that promote relaxation, such as reading, crafting, or gardening, can provide a mental escape from the challenges of long COVID and help individuals reclaim a sense of normalcy and enjoyment.

Nutrition and hydration are also essential components of self-care for long COVID. A balanced diet not only supports general health but can also aid in the recovery process. Consuming a variety of whole foods, including fruits, vegetables, lean proteins, and whole grains, helps to provide the necessary nutrients to the body as it heals. Proper hydration is equally important, as it helps maintain energy levels and supports overall bodily functions. Drinking plenty of water throughout the day can help combat dehydration, which is common in people with long COVID due to the effects of the virus on the body. In some cases, individuals may benefit from consulting a nutritionist to address specific dietary concerns or to develop a meal plan that meets their nutritional needs while managing symptoms. For example, some people may need to focus on anti-inflammatory foods to help manage joint pain or other inflammatory symptoms associated with long COVID.

While physical activity may seem counterintuitive when dealing with fatigue and other symptoms of long COVID, gentle exercise can actually be quite beneficial for both physical and mental health. Engaging in low-impact exercises, such as short walks, stretching, swimming, or cycling, can help to improve circulation, maintain joint flexibility, and boost mood. It's crucial, however, to start with activities that are manageable and gradually increase the level of activity based on personal tolerance. Pushing too hard too soon can lead to a worsening of symptoms, so individuals should listen to their bodies and adjust their routines accordingly. Over time, small increases in physical activity can help improve endurance and reduce feelings of fatigue, as long as the approach remains adaptive and paced appropriately.

In addition to exercise, sleep hygiene plays a critical role in managing long COVID. Quality sleep is essential for recovery, as it allows the body to rest and repair itself. Many people with long COVID report sleep disturbances, including difficulty falling asleep, staying asleep, or experiencing restorative sleep. To improve sleep hygiene, it is important to establish a regular sleep schedule, going to bed and waking up at the same time each day to promote consistency. Creating a restful sleep environment free from distractions, such as noise, light, or electronic devices, can also enhance sleep quality. Limiting screen time before bed is particularly important, as the blue light emitted by phones and computers can interfere with the body's natural sleep-wake cycle. In addition, relaxation techniques, such as meditation or reading, can help individuals wind down before sleep and reduce feelings of anxiety or restlessness that may interfere with rest.

Social support is an often overlooked but crucial aspect of managing long COVID. The isolation that many people with long COVID experience can exacerbate both physical and mental health challenges. Connecting with others who are going through similar experiences can provide emotional support and a sense of community. Joining support groups, either in-person or online, can help individuals feel understood and validated, while sharing experiences with others who face similar challenges can provide valuable coping strategies. It's also important to maintain regular contact with friends and family, even if it's just for brief check-ins. These social connections can provide a much-needed source of encouragement and help reduce feelings of loneliness or isolation.

Adaptive self-care is a vital tool for managing long COVID. By implementing strategies that focus on pacing, mindfulness, nutrition, physical activity, sleep hygiene, and social support, individuals can take proactive steps toward improving their quality of life during the recovery process. It's essential to recognize that each person's experience with long COVID is unique, and finding the right balance of self-care practices may take time and experimentation. It's also important to seek guidance from healthcare professionals to ensure that self-care strategies complement any medical treatments or interventions. With patience, self-compassion, and the right adaptive strategies, individuals living with long COVID can regain their strength, reduce symptoms, and ultimately improve their overall well-being.

The Adaptive Self-Care Framework is based on Orem's Self-Care Deficit Nursing Theory, which emphasizes the need for nursing care when individuals are unable to meet their self-care needs independently [24]. Long COVID often manifests with significant physical, cognitive, and emotional impairments that prevent patients from performing daily activities. This framework focuses on patient education, empowerment, and a gradual return to self-care independence.

Key Elements of the Adaptive Self-Care Framework:

1. Patient Education:

Education is a fundamental aspect of this framework, providing patients with essential knowledge about long COVID and strategies for managing it. Topics covered include energy conservation techniques, symptom monitoring, and pacing strategies to prevent exacerbations, particularly of post-exertional malaise [25, 26].

2. Empowerment:

Empowering patients means fostering self-efficacy and confidence in their ability to manage their

symptoms. Nurses can use motivational interviewing and goal-setting techniques to encourage patients to actively participate in their care plans and make informed decisions about their treatment [27].

3. **Gradual Independence:**

Rehabilitation programs are customized for each patient, with adjustments made based on progress. For example, activity schedules are designed to optimize physical recovery while minimizing fatigue, allowing for a gradual increase in the patient's ability to perform self-care activities independently [28].

This framework aims to help patients regain autonomy and achieve a sustainable quality of life, in alignment with person-centered and holistic care principles.

Resilience-Oriented Care

Resilience-Oriented Care represents a transformative shift in healthcare, emphasizing the importance of strengthening individuals' ability to face adversity, stress, and illness. This approach is grounded in the belief that patients, families, and communities possess inherent resources that can be nurtured to help them navigate health challenges more effectively. By focusing on resilience, healthcare systems can move beyond simply treating diseases and illnesses to empowering individuals to take an active role in their healing journey. Resilience-Oriented Care is not just about managing health conditions but about fostering well-being, growth, and the ability to adapt to life's inevitable difficulties. The following explores the principles, practices, and benefits of this approach, illustrating its potential to improve the healthcare experience and outcomes for all involved.

At the core of Resilience-Oriented Care is the concept of resilience itself. Resilience is generally defined as the ability to bounce back from adversity, stress, or trauma. In healthcare, resilience goes beyond merely surviving; it involves thriving despite the challenges that may arise due to illness or other health-related concerns. This approach shifts the focus away from viewing patients as passive recipients of care and instead positions them as active participants in their recovery and health maintenance. It encourages individuals to identify and utilize their internal and external resources, promoting a sense of agency and control in their healthcare journey.

One of the fundamental principles of Resilience-Oriented Care is empowerment. The empowerment of patients is a critical component in building resilience, as it helps individuals take an active role in decisions related to their health and treatment. This sense of control is crucial for fostering confidence and hope, both of which are essential to resilience. Empowerment also involves providing individuals with the tools and information necessary to make informed choices about their care, thereby increasing their sense of autonomy and participation. By encouraging patients to take ownership of their health, resilience-oriented care helps them develop the skills and mindset needed to manage their conditions more effectively.

Another essential principle is the holistic approach to care. Traditional healthcare often focuses on treating a specific illness or condition, with little regard for the broader context of an individual's life. In contrast, resilience-oriented care takes into account the physical, emotional, social, and spiritual aspects of a person. This holistic perspective allows healthcare providers to address the full spectrum of a patient's needs, recognizing that emotional well-being, social support, and spiritual fulfillment all play a critical role in recovery and overall health. By viewing patients as whole people, healthcare providers can better understand their unique challenges and provide care that nurtures all aspects of their well-being.

A strengths-based focus is another key principle of resilience-oriented care. Rather than concentrating solely on a patient's deficits or the severity of their illness, this approach seeks to identify and build upon their strengths. Resilience-oriented care encourages individuals to draw upon their personal resources, as well as the support of their families and communities, to face challenges with confidence. It emphasizes hope, determination, and the belief that individuals have the capacity to grow and adapt, even in the face of adversity. By identifying and cultivating strengths, healthcare providers help patients become more resilient and better equipped to manage their health.

Building supportive relationships is another cornerstone of resilience-oriented care. Strong, trusting relationships between patients, healthcare providers, and families are essential for promoting resilience. These relationships provide a sense of security, encouragement, and emotional support, all of which are critical for coping with health challenges. When individuals feel supported by their healthcare team and loved ones, they are more likely to stay engaged in their treatment and make progress toward their goals. Furthermore, supportive relationships can help patients feel less isolated, enabling them to share their experiences and fears, which can be vital for emotional healing.

Adaptability is also a fundamental principle of resilience-oriented care. Every patient is unique, and their needs, circumstances, and challenges can change over time. As such, resilience-oriented care is flexible and responsive to these changes. It recognizes that no two individuals are the same, and therefore, no one-size-fits-all approach can be applied. Care practices are tailored to meet the specific needs of each patient, allowing for adjustments as their health status or personal situation evolves. This adaptability ensures that patients receive the care they need at every stage of their journey.

Practices in resilience-oriented care reflect these guiding principles. For example, strengths assessment is a common practice used to help individuals recognize their personal strengths, as well as the resources available within their communities and families. By identifying these strengths, patients can develop greater self-efficacy and confidence in their ability to overcome challenges. Mindfulness and stress reduction techniques are also commonly incorporated into care plans, helping patients manage the emotional and psychological aspects of their health. Practices such as meditation, relaxation exercises, and breathing techniques have been shown to reduce stress, improve mood, and enhance overall well-being. These practices not only support emotional resilience but can also have tangible physical benefits by lowering stress-related hormones and improving immune function.

Education and skill-building are crucial components of resilience-oriented care as well. By providing patients with the knowledge and skills they need to manage their health and well-being, healthcare providers help individuals feel more competent and confident in handling their health challenges. Whether it's learning how to manage a chronic condition, practicing self-care techniques, or understanding the impact of nutrition and exercise on health, education empowers patients to take charge of their health. This knowledge, combined with a sense of agency, increases resilience by allowing patients to make informed choices and actively participate in their care.

Community engagement is another vital practice in resilience-oriented care. Encouraging patients to connect with their communities and access support networks can significantly improve their ability to cope with health challenges. Community involvement fosters a sense of belonging and social connectedness, which is a key protective factor in resilience. Whether it's through peer support groups, family networks, or local organizations, community resources can provide emotional support, practical assistance, and encouragement, all of which are crucial for building resilience. By engaging with their communities, patients not only gain a sense of solidarity but also access valuable resources and support that can help them overcome challenges.

Collaborative goal setting is another essential practice in resilience-oriented care. This practice involves working closely with patients to set health goals that are realistic, meaningful, and aligned with their values. These goals can help patients focus on what they can control, giving them a sense of purpose and direction. By collaborating with patients in setting these goals, healthcare providers encourage patients to take an active role in their care and treatment plans, further fostering resilience.

The benefits of resilience-oriented care are profound and far-reaching. One of the primary advantages is improved health outcomes. Patients who engage in resilience-oriented care often experience better physical and emotional health, as they are better equipped to manage stress and cope with the challenges of their illness. Studies have shown that individuals who feel empowered and supported in their healthcare journey tend to experience fewer symptoms, lower levels of anxiety and depression, and a higher overall quality of life.

Additionally, resilience-oriented care enhances coping skills, enabling individuals to deal more effectively with stress and adversity. By developing stronger coping mechanisms, patients can better manage their health challenges and reduce the impact of stress on their well-being. This leads to increased patient satisfaction, as patients feel more in control of their care and experience a more positive healthcare experience overall.

Resilience-oriented care strengthens support networks, fostering stronger relationships between patients, families, and communities. These networks create a sense of solidarity, connection, and shared responsibility, which are vital for maintaining emotional well-being and encouraging positive health outcomes.

Resilience-Oriented Care represents a paradigm shift in the healthcare landscape. By focusing on the strengths, capabilities, and resilience of individuals, this approach empowers patients to take control of their health and navigate challenges with confidence and hope. Through empowerment, holistic care, and a strength-based focus, healthcare providers can support individuals in achieving better health outcomes, improved coping skills, and a more fulfilling healthcare experience. This approach not only benefits patients but also strengthens healthcare systems by promoting a more compassionate, patient-centered model of care that prioritizes well-being over mere disease management.

The Resilience-Oriented Care Framework is grounded in the Neuman Systems Model, which emphasizes the interaction between stressors and the body's response mechanisms. Long COVID patients frequently encounter multidimensional stressors, including physiological symptoms, psychological distress, and social disruptions. This framework focuses on strategies to enhance resilience and coping capacity while minimizing the impact of stressors [29].

Key Components of the Resilience-Oriented Care Framework:

1. Coping with Physiological and Psychological Stressors:

The framework incorporates strategies such as mindfulness-based stress reduction (MBSR), cognitive-behavioral therapy (CBT), and relaxation techniques to address psychological issues like anxiety, depression, and sleep disturbances [30, 31]. Additionally, physical rehabilitation focuses on managing symptoms such as dyspnea, muscle weakness, and post-exertional malaise [32].

2. Social Support Systems:

The framework acknowledges the vital role of social support networks in building resilience. Support groups for long COVID patients and family-centered care approaches offer both emotional and practical assistance. Nurses play a key role in connecting patients to community resources and encouraging peer support to strengthen their coping capacity [33, 34].

3. Nurse-Led Interventions:

Nurses serve as central figures in fostering resilience by conducting thorough assessments of stressors and implementing prevention strategies. For instance, they educate patients on recognizing early warning signs of symptom exacerbation and taking proactive steps to manage their condition [35].

By addressing both internal and external stressors, this framework supports long COVID patients in achieving greater psychological stability and overall well-being.

Framework 3: Multidisciplinary Care Collaboration

The Multidisciplinary Care Collaboration Framework emphasizes the importance of a team-based approach to managing long COVID, recognizing that no single discipline can fully address the complexity of the condition. This framework integrates nursing, physiotherapy, psychology, and primary care, with nurses positioned as key coordinators of care [36].

Key Elements of the Multidisciplinary Care Collaboration Framework:

1. Interdisciplinary Teamwork:

This framework promotes collaboration among healthcare professionals to deliver comprehensive care. For example, physiotherapists develop individualized exercise programs, psychologists provide mental health support, and primary care providers oversee general medical management [37].

2. Role of Nurses as Care Coordinators:

Nurses play a critical role in ensuring coordination across disciplines, minimizing fragmentation, and maintaining continuity of care. They facilitate communication among team members, monitor patient progress, and adjust care plans as necessary [38, 39]. For instance, nurses may act as liaisons to ensure physiotherapists are aware of any psychological barriers that could impact a patient's adherence to rehabilitation.

3. Holistic Care Plans:

Care plans are designed to address the physical, psychological, and social needs of patients simultaneously. For instance, a patient dealing with fatigue, anxiety, and social isolation would benefit from a plan that incorporates graded exercise therapy, cognitive-behavioral therapy (CBT), and resources for community engagement [40].

4. Technology Integration:

Telehealth platforms and digital tools support team collaboration and provide patients with accessible resources to manage their care. Remote monitoring and virtual consultations enhance continuity of care, enabling timely interventions [41, 42].

The Multidisciplinary Care Collaboration Framework promotes synergy among healthcare providers, optimizing outcomes for long COVID patients while improving the efficiency of healthcare delivery.

Implementation and Implications

The implementation of the proposed theoretical frameworks for managing long COVID requires strategic planning, structured training, and policy-level advocacy. By integrating these frameworks into nursing practice, healthcare systems can better address the complex and multidimensional needs of long COVID patients. This section discusses practical applications, expected patient outcomes, policy implications, and future directions to ensure these frameworks achieve their intended impact.

Practical Application

Successfully implementing the proposed frameworks requires equipping nurses with the necessary knowledge and skills to apply them effectively. Developing training programs, care protocols, and resources is essential to ensure these frameworks are seamlessly integrated into clinical practice.

1. Training Nurses to Apply These Frameworks:

Comprehensive training programs are essential to prepare nurses for the complexities of managing long COVID. These programs should include modules on the biopsychosocial aspects of long COVID, patient-centered care principles, and the practical application of the Adaptive Self-Care, Resilience-Oriented Care, and Multidisciplinary Care Collaboration frameworks [43]. Simulation-based learning and case-based discussions can enhance nurses' ability to apply theoretical knowledge in real-world settings, improving their clinical decision-making skills [44].

2. Development of Care Protocols Tailored to Long COVID:

Standardized care protocols grounded in these frameworks are necessary to ensure consistent, high-quality care. These protocols should include tools for assessing physical, psychological, and social needs,

intervention strategies for symptom management, and guidelines for fostering interdisciplinary collaboration [45]. For instance, protocols could outline steps for managing post-exertional malaise using energy-conservation techniques, alongside mental health support aimed at building psychological resilience [46].

3. Integration of Digital Tools and Telehealth:

Technology plays a critical role in facilitating the implementation of these frameworks. Digital tools, such as symptom-tracking apps and telehealth platforms, allow for remote monitoring and continuous patient support. These tools enhance accessibility, particularly for patients in underserved areas, while maintaining continuity of care [47].

Patient Outcomes

The application of these frameworks is expected to lead to significant improvements in patient outcomes, especially in symptom management, quality of life, and psychological well-being.

1. Symptom Management:

These frameworks offer a comprehensive approach to managing the multidimensional nature of long COVID symptoms. For example, the Adaptive Self-Care framework empowers patients to actively engage in managing their symptoms, leading to better adherence to care plans and reduced symptom burden [48].

2. Quality of Life:

Holistic interventions that combine physical rehabilitation, mental health support, and social reintegration contribute to enhanced quality of life. The Resilience-Oriented Care framework, which focuses on stress management and strengthening social support systems, helps patients regain functional independence and emotional stability [49].

3. Psychological Well-Being:

Many long COVID patients experience anxiety, depression, and post-traumatic stress. These frameworks address these issues directly through interventions such as cognitive-behavioral therapy (CBT) and peer support groups, which foster psychological resilience and reduce emotional distress [50].

Policy Implications

The success of these frameworks depends on their integration into healthcare policy and the allocation of resources to support their implementation.

1. Advocating for Inclusion in Healthcare Guidelines:

Policymakers should recognize the value of structured nursing frameworks in managing long COVID and include them in both national and international healthcare guidelines. Such inclusion ensures that evidence-based practices are consistently adopted across healthcare systems [51].

2. Need for Funding and Support:

Adequate funding is essential to support the development and implementation of these frameworks. Resources are needed for nurse training programs, the creation of digital tools, and the establishment of multidisciplinary care teams. Additionally, funding for long COVID research is necessary to refine these frameworks and develop new, evidence-based interventions [52].

3. Addressing Disparities in Care:

Policy measures must address disparities in access to long COVID care, especially in rural and underserved communities. Targeted efforts are needed to ensure equitable access to trained healthcare providers, telehealth resources, and rehabilitation services [53].

Future Directions

Ongoing research and refinement of these frameworks are essential to ensure their continued effectiveness and adaptability over time.

1. Longitudinal Studies to Evaluate Framework Effectiveness:

Future research should focus on assessing the long-term outcomes of patients managed using these frameworks. Key metrics such as symptom progression, quality of life, healthcare utilization, and

psychological resilience will offer valuable insights into their efficacy and guide necessary improvements [54].

2. Adaptation of Frameworks to Diverse Healthcare Settings:

The frameworks' applicability across various healthcare settings, including low-resource environments and culturally diverse populations, should be explored. Tailoring interventions to the unique needs of these settings will increase the global relevance and impact of the frameworks [55].

3. Incorporating Emerging Evidence:

As the understanding of long COVID evolves, these frameworks must be updated to reflect new findings. For instance, advancements in pharmacological treatments or novel rehabilitation techniques should be integrated into these frameworks to ensure that care remains aligned with the latest scientific knowledge [56].

4. Interdisciplinary Collaboration for Innovation:

Collaboration among nurses, researchers, policymakers, and technologists is crucial for fostering innovation in long COVID management. Developing advanced digital tools that integrate real-time patient data with predictive analytics can improve personalized care and enhance clinical outcomes [57].

Conclusion:

The complexity and variability of long COVID necessitate comprehensive and structured approaches to care that address the condition's multifaceted nature. This paper has proposed three theoretical nursing frameworks—Adaptive Self-Care, Resilience-Oriented Care, and Multidisciplinary Care Collaboration—as foundational models for managing the physical, psychological, and social challenges associated with long COVID. Rooted in established nursing theories like Orem's Self-Care Deficit Theory and the Neuman Systems Model, these frameworks emphasize holistic, patient-centered strategies that empower patients, enhance resilience, and promote interdisciplinary collaboration.

The Adaptive Self-Care Framework focuses on patient education and the gradual restoration of independence, helping long COVID patients regain functionality. The Resilience-Oriented Care Framework integrates stress management and social support systems, addressing the psychological and emotional challenges of the condition. The Multidisciplinary Care Collaboration Framework highlights the importance of coordinated, team-based approaches that draw on the expertise of various healthcare professionals to ensure comprehensive care.

Implementing these frameworks has significant implications for nursing practice, healthcare policy, and patient outcomes. Developing training programs, standardized care protocols, and policy advocacy are crucial for successful adoption. Furthermore, these frameworks offer a foundation for future research to refine and adapt care strategies for diverse healthcare settings and patient populations.

By incorporating these theoretical models into practice, nurses can play a central role in improving long COVID management, alleviating patient burden, and advancing holistic and equitable care. These efforts underscore the vital contribution of nursing to addressing emerging global health challenges.

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تطوير الإطار التمرضية لإدارة أعراض كوفيد طويل الأمد: دمج النماذج النظرية للرعاية الشاملة، الموجهة نحو المريض، والتعاون بين التخصصات

الملخص:

الخلفية:

يُعد كوفيد الطويل حالة معقدة تظهر لدى الأفراد بعد تعافهم من المرحلة الحادة لعدوى كوفيد-19. تتميز هذه الحالة بأعراض مستمرة تشمل الإرهاق المزمن، وضيق التنفس، وضعف الإدراك، والاضطرابات النفسية. تشكل هذه الأعراض تحديات كبيرة للمرضى ومقدمي الرعاية الصحية على حد سواء. يبرز دور التمريض كعامل رئيسي في إدارة هذه الحالة، ولكن لا تزال هناك حاجة إلى أطر نظرية واضحة لتوجيه التدخلات التمريضية.

الهدف:

يهدف هذا البحث إلى اقتراح أطر نظرية تمريضية لإدارة أعراض كوفيد الطويل، مع التركيز على التعليم الصحي للمرضى، وتعزيز استقلاليتهم، ودعم التكيف النفسي والاجتماعي.

الطرق:

يعتمد البحث على استعراض الأدبيات الحديثة وتحليل احتياجات المرضى بناءً على نتائج الدراسات السريرية والتقارير الذاتية. تم دمج النظريات التمريضية مثل نظرية أوريم للعجز في الرعاية الذاتية ونموذج نيومان لأنظمة التكيف لتطوير أطر تلبي احتياجات المرضى المعقدة.

النتائج:

أظهرت النتائج أهمية التعليم الصحي للمرضى لتعزيز فهمهم لحالتهم وتكيفهم معها، بالإضافة إلى دور التدخلات النفسية والاجتماعية في تعزيز التكيف. كما أوضحت أهمية العمل متعدد التخصصات لضمان تقديم رعاية شاملة وفعالة.

الخلاصة:

توفر الأطر النظرية المقترحة توجيهاً عملياً للتدخلات التمريضية لإدارة كوفيد الطويل. تساهم هذه الأطر في تحسين جودة حياة المرضى وتقليل العبء الصحي. يستلزم التنفيذ تدريباً مناسباً للكوادر التمريضية ودعمًا سياسياً ومالياً.

الكلمات المفتاحية:

كوفيد الطويل، الأطر النظرية، التمريض، الرعاية الذاتية، التكيف النفسي، الرعاية متعددة التخصصات.