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NEUROPSYCHOLOGICAL AND PSYCHOSOMATIC FACTORS INFLUENCING REHABILITATION POTENTIAL IN ONCOLOGY PATIENTS: AN INTEGRATIVE REVIEW

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This review underscores the critical role of psychosomatic and psychosocial factors in cancer rehabilitation, advocating for the integration of psychological assessments and interventions. It highlights how syndromes like health anxiety and alexithymia affect outcomes and calls for a multidisciplinary approach that includes psychological well-being alongside physical recovery, emphasizing the importance of cognitive-behavioral mechanisms and the development of tools for assessing psychosomatic factors.

Keywords: *Oncology Rehabilitation; Psychosomatic Factors; Rehabilitation Potential; Health Anxiety; Quality of Life.*

Introduction. The intersection of oncology and rehabilitation medicine represents a critical juncture in patient care, particularly in the context of improving quality of life and facilitating recovery for individuals diagnosed with cancer. As cancer treatments advance, increasing the survival rates, the focus shifts towards addressing the comprehensive rehabilitation needs of survivors. Research, including seminal works by Gilchrist et al. (2009), Grassi et al. (2004), and others, has laid a foundation for understanding both the physical and psychosomatic dimensions of rehabilitation in oncology. These studies underscore the complex interplay between the biological impacts of cancer, the psychological responses to illness and treatment, and the broader psychosocial factors influencing recovery trajectories. Notably, the Diagnostic Criteria for Psychosomatic Research (DCPR) introduced by Grassi et al. (2004) have illuminated the psychosocial variables critical in breast cancer patients' rehabilitation, highlighting the prevalence of health anxiety, demoralization, and alexithymia. Concurrently, the framework for assessment in oncology rehabilitation proposed by Gilchrist et al. (2009) emphasizes the need for a multidimensional approach to patient evaluation, incorporating neurobiological, psychological, and functional assessments to tailor rehabilitation interventions effectively.

Purpose. This article aims to synthesize existing research on the rehabilitation potential of cancer patients, with a particular focus on the integration of psychosomatic and psychosocial factors into rehabilitation planning and implementation.

Methods. Systematic searches were conducted across several databases, including PubMed, PsycINFO, and Google Scholar, to identify relevant studies published in the fields of oncology, rehabilitation medicine, psychosomatic research, and psychology. Keywords used in the search included "oncology rehabilitation," "psychosomatic factors in cancer," "psychosocial variables in cancer patients," "rehabilitation potential," and "quality of life in cancer survivors."

Originality. Rehabilitation potential encompasses a broad spectrum of issues, including its conceptualization as a distinct area within medical-psychological research and clinical practices. Key studies by Heinemann et al. (2020), Cowley et al. (2021), and Bikker et al. (2020) have highlighted the importance of understanding rehabilitation potential not only in terms of the patient's personal predispositions and somatic complications but also considering social support and quality of life factors, despite chronic or multiple disabilities. This potential is critically evaluated based on both individual variables such as age, sex, education, and skills, and environmental variables, notably the nature of available services, which often set practical limits on rehabilitation potential.

The discourse on rehabilitation potential in Ukrainian scientific literature appears somewhat neglected, especially concerning the neuropsychological determination of an individual's rehabilitation potential, despite its significance in international research (Wells et al., 2021; Champod et al., 2020; Boosman et al.,

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2015). Moreover, the phenomenon of rehabilitation potential is predominantly viewed through pathologized models, where the medical-psychiatric context has traditionally influenced the conceptual apparatus of medical and clinical psychology, focusing more on deficits rather than strengths and health, thereby prioritizing disease over wellness.

This ideology of morbidity inevitably influences the perception of psychological problems, directing attention primarily towards aspects of human behavior deemed abnormal or clinical. Maddux et al. (2004) identify three primary ways this uncritical reception of disease ideology has shaped the field of clinical psychology, including promoting a dichotomy between normal and abnormal behavior, placing maladaptation within the individual rather than their interactions with the environment, and portraying those seeking help as victims of intrapsychic and biological forces beyond their control.

Given the growing prevalence of traumatic events and the importance of preventing a wide range of potential negative psychosocial outcomes, it's reasonable that models of medical-psychological support for rehabilitation potential have expanded from those based solely on medical models to those also encompassing public health concepts. This shift from "compensatory" to "capitalization" therapy models emphasizes leveraging an individual's strengths for growth.

The phenomenology of rehabilitation potential opens perspectives for refining the psychological characteristics of posttraumatic growth, emphasizing positive changes following stressful and traumatic events as a methodology of positive psychology. This approach, highlighting subjective psychological well-being and posttraumatic growth, suggests a gradual, stepwise development over time, moving towards a more inclusive society and preparing individuals for a full and productive life.

The seminal work by Nagi (1964) on the evaluation of disability and rehabilitation potential offers a foundational perspective for understanding and assessing the rehabilitation needs and capabilities of individuals, particularly within the context of oncology rehabilitation. Nagi's approach emphasizes the importance of a comprehensive evaluation that incorporates both individual and environmental variables to accurately assess an individual's rehabilitation potential. This holistic view is critical in the oncology setting, where the impact of cancer and its treatment on a patient's functional abilities and quality of life necessitates a multifaceted approach to rehabilitation.

Nagi's concept of rehabilitation potential, focusing on the prognostic evaluation of the levels of functioning an individual can achieve, aligns with the goals of oncology rehabilitation. In cancer care, assessing rehabilitation potential involves evaluating not only the physical impairments resulting from the disease and its treatment but also considering nonclinical individual variables such as age, sex, education, and skills. These factors can significantly influence the design and outcomes of rehabilitation interventions, highlighting the necessity for personalized rehabilitation plans.

Nagi's discussion on the critical role of environmental variables in determining rehabilitation potential is particularly relevant in the oncology rehabilitation context. The availability and nature of rehabilitation services, including the comprehensiveness of programs, the competence of staff, and financial resources, significantly influence the extent to which a patient can recover and regain function. This underscores the importance of advocating for better resources and support systems for cancer rehabilitation, ensuring that all patients have access to the services needed to achieve their maximum rehabilitation potential.

Nagi's identification of five areas of evaluation (social, medical, psychological, occupational, and vocational) for a comprehensive assessment of disability and rehabilitation potential can be directly applied to oncology rehabilitation. Incorporating these evaluations ensures a holistic understanding of the patient's situation, facilitating the development of targeted rehabilitation plans that address not only physical impairments but also psychological, social, and vocational challenges. The inclusion of a panel evaluation, synthesizing insights from separate evaluations, supports the creation of integrated, patient-centered rehabilitation strategies.

In conclusion, the evaluation framework described by Nagi offers a valuable model for oncology rehabilitation, emphasizing the need for a comprehensive and multidisciplinary approach to patient assessment. By integrating

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medical, psychological, occupational, and vocational evaluations, oncology rehabilitation professionals can develop personalized rehabilitation plans that address the unique needs of cancer survivors, ultimately enhancing their rehabilitation potential and quality of life.

Incorporating the findings from O'Toole and Golden (1991) into our discussion on rehabilitation potential underscores the critical role of functional assessment in oncology rehabilitation. These findings are instrumental for several reasons. First, they demonstrate the tangible benefits of targeted rehabilitation services in improving the functional independence of cancer patients, a cornerstone in enhancing quality of life. Second, the study's approach to correlating the KPS with the FIM offers a nuanced method for assessing patients' rehabilitation potential, advocating for a more individualized and function-focused care plan. This alignment encourages oncologists and rehabilitation specialists to consider both inpatient and outpatient rehabilitation services for a broader spectrum of cancer patients, moving beyond traditional criteria to include functional performance and potential for improvement as key considerations.

Considering O'Toole and Golden's (1991) study, it becomes evident that incorporating comprehensive functional assessments into the care of cancer patients can significantly impact rehabilitation outcomes. This integration not only facilitates a more precise identification of rehabilitation needs but also aids in tailoring interventions that address specific functional deficits. Consequently, this approach can lead to substantial improvements in patients' independence and quality of life, reinforcing the importance of functional assessments as a fundamental component of oncology rehabilitation programs.

Incorporating insights from the study by Movsas et al. (2003) provides a compelling argument for the integration of comprehensive rehabilitation assessments within medical oncology care. Their research, meticulously documenting the rehabilitation needs of patients admitted to an inpatient medical oncology unit, underscores a critical gap in the identification and management of functional impairments among cancer patients. With the mean Functional Independence Measure (FIM) scores revealing significant functional limitations upon admission, the study highlights the prevalence of unmet rehabilitation needs, ranging from deconditioning and mobility impairments to deficits in activities of daily living.

This evidence emphasizes the necessity for a multidisciplinary approach to cancer care, one that includes rehabilitation medicine specialists from the outset of treatment. The discrepancy between functionally based physical examinations and FIM scores further suggests that traditional assessment methods may overlook key areas of rehabilitation need. The findings from Movsas et al. (2003) resonate with our proposed integrative framework, advocating for the inclusion of functional assessments and rehabilitation planning as core components of oncology care. By doing so, oncologists and rehabilitation specialists can collaboratively identify and address the multifaceted needs of cancer patients, enhancing their rehabilitation potential and overall quality of life.

The study by Gilchrist et al. (2009) provides a robust framework for assessing rehabilitation needs and outcomes in oncology patients through the lens of the International Classification of Functioning, Disability and Health (ICF). The ICF model, developed by the World Health Organization, offers a comprehensive biopsychosocial approach to understand health and disability, encompassing body function and structure, activity, and participation as its core domains. This framework is pivotal for rehabilitation professionals, including physical therapists, in the oncology setting to evaluate and address the multifaceted impacts of cancer and its treatments on patient function.

The integration of the ICF framework into oncology rehabilitation represents a significant advancement in the field, promoting a more nuanced and holistic understanding of patient needs and outcomes. By embracing this model, rehabilitation professionals can better design and implement interventions that address the complex interplay of physical, psychological, and social factors affecting cancer patients, ultimately contributing to improved rehabilitation potential and quality of life.

The rehabilitation potential: neurobiological mechanisms

The rehabilitation potential of a patient, particularly in the context of neurological recovery, is underpinned by various neurobiological mechanisms. These

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mechanisms facilitate the brain's ability to adapt, reorganize, and recover from injury or disease. Understanding these mechanisms is crucial for designing effective rehabilitation interventions. The primary neurobiological mechanisms involved in ensuring a patient's rehabilitation potential include:

Neuroplasticity. This is the brain's ability to reorganize itself by forming new neural connections throughout life. Neuroplasticity allows the neurons (nerve cells) in the brain to compensate for injury and disease and to adjust their activities in response to new situations or changes in their environment. This mechanism is fundamental to recovery from neurological conditions and is a target for many rehabilitation therapies.

Synaptic Plasticity. A subset of neuroplasticity, synaptic plasticity is the ability of synapses (the points of communication between neurons) to strengthen or weaken over time, in response to increases or decreases in their activity. Synaptic plasticity is crucial for learning and memory, and therapies that enhance synaptic efficiency are believed to support cognitive and functional recovery in rehabilitation settings.

Axonal Sprouting. In response to damage, axons (the long, threadlike parts of a nerve cell along which impulses are conducted) can grow new sprouts to reconnect with other neurons, potentially forming new neural pathways to bypass damaged areas. This mechanism can be harnessed in rehabilitation to restore function or compensate for lost abilities.

Neurogenesis. Although once thought impossible in adults, recent evidence suggests that the human brain can generate new neurons in certain areas, such as the hippocampus, which is involved in learning and memory. Enhancing neurogenesis through physical activity, cognitive engagement, and certain medications may contribute to rehabilitation outcomes.

Functional Reorganization. Following injury, the brain can undergo reorganization, where functions previously managed by damaged areas are taken over by other regions. Rehabilitation therapies often aim to facilitate this process, encouraging the brain to adapt and find new ways to perform tasks.

Biochemical Factors. Recovery and rehabilitation are also influenced by various biochemical factors in the brain, including neurotrophins like brain-derived neurotrophic factor (BDNF), which supports the survival of existing neurons and encourages the growth of new neurons and synapses. Modulating these factors through diet, exercise, and pharmacological interventions can enhance rehabilitation potential.

Inflammatory Responses. While acute inflammation is a natural part of the body's response to injury, chronic inflammation can hinder recovery. Managing inflammation through medical and lifestyle interventions can support neurorehabilitation efforts.

Cortical Remapping. Intensive rehabilitation training can lead to cortical remapping, where the brain allocates more cortical area to the functions being trained. This is seen in motor and sensory rehabilitation, where repeated practice of a task leads to greater brain areas being dedicated to that task, improving performance and function.

By leveraging these neurobiological mechanisms, rehabilitation professionals can design interventions that not only aim to restore lost functions but also harness the brain's innate capacity for adaptation and recovery. This approach emphasizes the dynamic and interactive nature of rehabilitation, where targeted therapies can significantly influence the patient's recovery trajectory.

The exploration of psychosomatic factors affecting rehabilitation potential, as detailed by Yardley and Redfern (2001), highlights the complex interplay between psychological states and physical health outcomes, particularly in the context of balance disorders. This research underscores the significant association between anxiety disorders and balance dysfunction, with an elevated prevalence of anxiety diagnoses, such as panic disorder and agoraphobia, among individuals experiencing balance disorders. Furthermore, the presence of balance system dysfunction has also been noted in individuals with panic disorder and agoraphobia, suggesting a bidirectional relationship between these conditions.

Association Between Anxiety and Balance Disorders. Anxiety disorders are significantly more common in individuals with balance disorders than in the general population. This relationship is supported by both clinical samples and community surveys, indicating a broader psychosomatic connection between anxiety and balance dysfunction.

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Somatopsychic and Psychosomatic Processes. The experience of dizziness can lead to panic and avoidance behaviors, highlighting somatopsychic processes where physical symptoms provoke psychological reactions. Conversely, psychosomatic processes may also play a role, where psychological factors contribute to the onset, persistence, or severity of balance system dysfunction.

Cognitive-Behavioral Mechanisms. Recovery from vestibular disorders involves cognitive-behavioral processes akin to habituation to anxiety and neurological adaptation to perceptual disorientation. This parallel suggests that psychological interventions targeting cognitive and behavioral responses to anxiety and dizziness could facilitate rehabilitation.

Psychophysiological Links. The physiological arousal associated with anxiety can exacerbate dizziness and imbalance, suggesting that managing anxiety and its somatic manifestations could be crucial for recovery from vestibular disorders.

Role of Attention. The cognitive demand of orientation activities implies that attention plays a significant role in balance control. Patients with persistent dizziness may benefit from therapies aimed at enhancing attentional control and perceptual-motor skills.

The study by Grassi et al. (2004) delves into the psychosomatic factors affecting the rehabilitation potential of breast cancer patients, utilizing the Diagnostic Criteria for Psychosomatic Research (DCPR) to examine the interplay between psychological states and cancer recovery. Key findings from this study underscore the significant presence of DCPR syndromes, particularly health anxiety, demoralization, and alexithymia, among breast cancer patients. These syndromes are linked to a poorer quality of life and heightened cancer-related concerns, illustrating the profound impact of psychosomatic factors on patient well-being and recovery.

Key Psychosomatic Factors Influencing Rehabilitation Potential:

Prevalence of DCPR Syndromes. Two-thirds of breast cancer patients exhibited DCPR syndromes, notably health anxiety, demoralization, and alexithymia, highlighting the need for comprehensive psychological evaluation in this population.

Impact on Quality of Life. Patients with DCPR syndromes reported a diminished quality of life, particularly in aspects such as leisure activities, general well-being, and interpersonal support, underscoring the detrimental effects of psychosomatic conditions on daily living and adjustment to illness.

Cancer-Related Concerns. Elevated levels of cancer-related worries, including fears of recurrence and sexual problems, were more prevalent among patients with DCPR syndromes, pointing to the role of psychosomatic factors in exacerbating cancer-related anxieties.

Coping Styles. While no significant differences in coping styles were observed between patients with and without DCPR diagnoses overall, specific DCPR syndromes correlated with coping mechanisms, such as health anxiety with anxious preoccupation and demoralization with hopelessness.

This study highlights the necessity for a broad investigation of the psychological consequences of medical illness, particularly in breast cancer. The association between DCPR syndromes and aspects of quality of life and coping suggests that addressing psychosomatic factors could enhance rehabilitation outcomes. Moreover, the study calls for further research to clarify the role of specific DCPR syndromes and to explore less reliable parameters, such as fighting spirit and fatalism.

In conclusion, the application of the DCPR in breast cancer patients provides valuable insights into the psychosomatic dimensions of cancer recovery. Further validation and refinement of the DCPR system are essential for enhancing its utility in clinical practice, ultimately improving the psychosocial and rehabilitation outcomes for breast cancer patients.

Conclusion. The comprehensive review of existing literature on the rehabilitation potential of cancer patients, with a focus on psychosomatic and psychosocial factors, illuminates several key insights that have significant implications for clinical practice and future research in oncology rehabilitation. First and foremost, the association between psychosomatic syndromes—such as health anxiety, demoralization, and alexithymia—and rehabilitation outcomes underscores the necessity of integrating psychological assessments and interventions into the standard

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rehabilitation protocols for cancer patients. This integration is not merely an enhancement of care but a fundamental component necessary for addressing the holistic needs of patients undergoing cancer treatment and recovery.

The prevalence of psychosomatic syndromes among cancer patients and their impact on quality of life and coping strategies emphasizes the need for healthcare providers to adopt a multidisciplinary approach. This approach should combine the expertise of oncologists, rehabilitation specialists, psychologists, and social workers to craft individualized rehabilitation plans that address both the physical and psychological aspects of recovery.

In conclusion, this article reaffirms the critical importance of considering psychosomatic and psychosocial factors in the rehabilitation of cancer patients. An integrated, patient-centered approach that addresses the complex interplay between physical health and psychological well-being is essential for maximizing rehabilitation potential and improving long-term outcomes for cancer survivors. Future research should continue to explore this interplay, with a focus on developing and validating practical assessment tools and interventions that can be seamlessly incorporated into oncology rehabilitation practices.

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НЕЙРОПСИХОЛОГІЧНІ ТА ПСИХОСОМАТИЧНІ ЧИННИКИ ВПЛИВУ НА РЕАБІЛІТАЦІЙНИЙ ПОТЕНЦІАЛ ОНКОЛОГІЧНИХ ХВОРИХ: ІНТЕГРАТИВНИЙ ОГЛЯД

В пропонованому огляді досліджено міждисциплінарні виміри нейропсихологічних і психосоматичних факторів реабілітаційного потенціалу онкологічних пацієнтів. На основі метатеоретичного аналізу узагальнено провідні дослідження в цьому напрямку щодо впливу цих факторів на результати реабілітації, а також обґрунтовано необхідність інтеграції психологічних оцінок та втручань у стандартні протоколи реабілітації.

Мета - узагальнити сучасні дослідження впливу психосоматичних та психосоціальних факторів на реабілітаційний потенціал онкологічних хворих, зокрема комплексного підходу до реабілітації, який би враховував психологічне благополуччя разом із фізичним відновленням.

Методи дослідження. Використовуючи систематичний пошук у реферативних базах даних, таких як PubMed, PsycINFO та Google Scholar, в огляді зібрано релевантні дослідження за ключовими словами, пов'язаними з онкологічною реабілітацією, психосоматичними факторами та психосоціальними змінними. Такий методологічний підхід забезпечує ретельний аналіз та інтерпретацію даних.

Результати. Аналіз виявив значну кореляцію між психосоматичними синдромами (наприклад, тривогою за здоров'я, деморалізацією, алекситимією) та результатами реабілітації онкологічних пацієнтів. Це підкреслює вирішальну роль когнітивно-поведінкових механізмів та уваги у відновленні

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порушень рівноваги та припускає, що психологічні інтервенції можуть суттєво доповнити протоколи з фізичної реабілітації.

Наукова новизна. Цей огляд висвітлює власне нейропсихологічні засади оптимізації реабілітаційного потенціалу, пропонуючи перспективи, зосереджуючись на сильних сторонах і благополуччі пацієнтів, а не на традиційних патологізованих моделях реабілітації.

Практична значущість. Практичне значення цього дослідження полягає в тому, що воно закликає до розробки спрощених інструментів для оцінки психосоматичних факторів, спрямованих на поліпшення клінічної практики в онкологічній реабілітації. Воно виступає за мультидисциплінарний реабілітаційний підхід, що об'єднує онкологію, реабілітаційну медицину, психологію та досвід соціальної роботи.

Висновки і подальші дослідження. Інтеграція психосоматичних і психосоціальних аспектів у протоколи реабілітації має фундаментальне значення для всебічного задоволення комплексних потреб онкологічних пацієнтів. Такий підхід, орієнтований на пацієнта, з акцентом на психологічному благополуччі поряд з фізичним відновленням, є важливим для максимізації реабілітаційного потенціалу. Майбутні дослідження повинні зосередитися на розробці та валідації практичних інструментів оцінки та втручань, які включають психосоматичні аспекти в онкологічну реабілітацію, покращуючи якість життя і довгострокові результати здоров'я людей, які пережили рак.

Цей огляд підкреслює важливість врахування нейропсихологічних і психосоматичних чинників у реабілітації онкологічних пацієнтів, виступаючи за комплексний підхід, який враховує взаємодію між розумом і тілом у процесах одужання. Дослідження відкриває шляхи для майбутніх досліджень з метою подальшого вивчення та інтеграції цих важливих факторів у клінічну практику, що в кінцевому підсумку має на меті покращити реабілітаційний потенціал та загальне благополуччя онкологічних пацієнтів.

Ключові слова: *онкологічна реабілітація; психосоматичні фактори; реабілітаційний потенціал; тривога за здоров'я; якість життя.*

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