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Review Article

Conceptualizing Functional Ability in Heart Failure: A Concept Analysis and Implications for Nursing Practice

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Abstract

The review article discussed the concept of functional ability. It is a critical outcome in patients with heart failure that reflects the prognosis of the disease. Therefore, a deeper understanding of this term's meaning, components, and operational definition is required in nursing practice. This paper aims to clarify the concept of functional ability for people with heart failure. This term is used in many ways, but its meaning, components, and assessment may vary. Consequently, the concept analysis was used to develop an operational definition, critical attributes, antecedents, consequences, and empirical referents. Functional ability encompasses physical, social, and psychological components essential for independent living in patients with heart failure. Determining the defining attributes includes physical ability, social ability, and psychological ability. This paper also defines the antecedents of functional ability, consisting of musculoskeletal capacity and muscle strength, the ability to move, good communication skills, and good cognition. Consequences include quality of life and well-being, health status, vital lung capacity, disease prognosis, good relationship, depression, dependence, fall, and hospitalization. In addition, the article provides empirical references for the measurement of functional abilities, such as the assessment of physical activity in daily life, mobility and work, the assessment of behavior in social activities, interaction and communication with others, and the assessment of emotion and feelings. This review provides a clearer understanding of the concept of functional ability and a new emphasis on the importance of targeting interventions to promote functional ability for patients with heart failure.

Keywords: Functional ability, Heart failure, Concept analysis

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Introduction

Patients with heart failure exhibit reduced functional abilities, which have been linked to their prognosis, clinical outcomes, and consequent loss of quality of life.[1] Functional ability is significant for the cardiovascular, muscular, and physiological assessments in chronic disease, including heart failure. It has a crucial role in predicting disease prognosis.[2-4] Functional ability has several meanings and is often used in operational definition in the health care research.[5, 6] The literature lacks clarity regarding the meaning and components of functional ability. Most definitions rely on functional domains assessed using various tools, primarily focusing on physical function and the ability to perform activities of daily living (ADL).[7-9]

Based on the literature, functional ability has several components including physical activity,[5] physical ability,[10, 11] ADL,[5, 12] and combined abilities.[2, 13-15] Good functional ability is

associated with good clinical outcomes, prognosis, health status, and reduced disease severity.[14] Functional ability is often confused with functional status and capacity, though they differ.[16-18] Functional status refers to patient-centered health outcomes,[19] while functional capacity is defined by maximal oxygen uptake.[17, 20]

Although efforts have been made to clarify what functional ability is, there is still considerable confusion.[7] In both clinical practice and research studies, it is difficult to improve functional ability when there are still unknown definitions, meanings, components, and appropriate instruments. The literature review also revealed that operational definitions and instruments vary across studies.[13, 21, 22] In addition, no study has conducted a systematic review and meta-analysis (SRMA) of functional ability in heart failure. Existing evidence was only found in the SRMA on functional status [23] and functional capacity in patients with heart failure.[24] To achieve consistent scientific communication about functional ability, this paper aimed to generate an analysis of the concept of functional ability especially with the relation to heart failure. Clarifying a vague concept and providing an accurate meaning, operational definition, components, and measured instrument of functional ability would be useful to determine prognosis, readmission rate, hospitalization, and mortality in patients with heart failure.[25] Walker and Avant's[26] method of concept analysis was used to guide this study as it provides a systematic and structured approach to clarify and define concepts which is essential for understanding and advancing knowledge in nursing and other disciplines. In addition, this approach is easy to understand, so that it can be readily applied by the researchers.[27]

Concept Analysis of Functional Ability

The 8-step of concept analysis according to the approach of Walker et al[26] are as follows: 1) selection of a concept, 2) determining the aims or purposes of the analysis, 3) identification of all concept uses, 4) determining the defining attributes, 5) identifying a model case, 6) identifying borderline cases, related cases, and contrary cases, 7) identifying antecedents and consequences, and 8) defining empirical referents.

Selection of Concept

The concept of functional ability was chosen to conduct the concept analysis because it is widely used in nursing, and it has various definitions, components, and instruments to measure that has been used in nursing research and practice.[16, 28] Furthermore, this concept is not a primitive umbrella term, but it is important for functional assessment and reflection of the quality of care, quality of life, clinical outcomes, and prognosis of patients with heart failure.

Determining the Aims or Purposes of the Analysis

The methods could be used to clarify the meaning and examine components of functional ability, develop an operational definition and select the appropriate instrument for assessing functional ability that can be used in nursing research on patients with heart failure patients.[26]

Identification of All Concept Uses

The term 'functional ability' has several meanings. The Medical Dictionary defines it as the ability to perform activities of daily living, including bathing, dressing, and other

independent living skills, such as shopping and housework.[29] The Cambridge Dictionary splits this term into 2 words: functional and ability,[30] 'functional' refers to working in the expected or necessary way, while 'ability' is the physical or mental strength or skill needed to do something. The Encyclopedia describes functional ability as the ability to manage daily life, including basic functions that enable people to socialize, work, or engage in a variety of other productive and social activities, including self-care activities and ADL that reflect a person's ability to live independently in the community.[31] In addition, the World Health Organization (WHO) states that functional ability is a combination of the individual's intrinsic ability, relevant environmental characteristics, and interaction between them.[32]

Functional ability was identified as a keyword for searches in the Google Scholar, PubMed, CINAHL, ProQuest, ThaiJo, and Cochrane databases. The word 'functional ability' is included either in the title, content, or keyword and serves as a criterion for the selection of research articles. The literature was searched in English for the ones published up to 2024. The authors used meanings from various fields, including nursing, medicine, and others.[26] In many articles, the term was not clearly defined. Thus, the literature search revealed 38 articles that clearly defined functional ability (Table 1) and presented the number of articles appearing in each attribute (Table 2).

Definition of Functional Ability

Based on the literature review, several keywords for functional ability cover a wide variety of disciplines, including physiology, psychology, medicine, and nursing. It can be summarized that functional ability consists of 3 aspects: physical, social, and psychological abilities, and the definition of functional ability can be refers to the physical, social, and psychological ability to perform independent ADL.

Table 1. Definitions of Functional Ability

Author	Field	Definition
Avlund et al,[5] 1995	Nursing	Ability to perform ADL
Han et al,[8] 2022	Nursing	Ability to perform ADL
Mandelli et al,[9] 2020	Nursing	Ability to perform ADL
Elsawy et al,[12] 2011	Nursing	Ability to perform ADL
Lara-Ruiz,[21] 2019	Nursing	Ability to perform ADL
Sablonnière et al,[33] 2021	Nursing	Ability to perform ADL
Oliveira et al,[34] 2020	Nursing	Ability to perform ADL
Kalpana et al,[10] 2021	Nursing	Ability to perform ADL
Rodrigues et al,[35] 2008	Nursing	Ability to perform ADL
Yaqoob et al,[36] 2018	Nursing	Ability to perform ADL
Elżbieciak,[37] 2017	Nursing	Ability to perform ADL
Nielsen et al,[38] 2014	Nursing	Ability to perform ADL
Ohenewa et al,[39] 2021	Nursing	Ability to perform ADL
Advinha et al,[40] 2021	Nursing	Ability to perform ADL
Chinchai et al,[41] 2017	Nursing	Ability to perform ADL and communication

Table 1. Definitions of Functional Ability (Continued)

Author	Field	Definition
Gialanella et al,[42] 2022	Nursing	Ability to perform ADL and muscle strength of lower limbs and range of motion of lower limbs
Purdy,[43] 2002	Nursing	Ability to perform ADL, linguistic abilities, cognitive abilities, and communication
Finkel,[44] 2020	Nursing	Performance in 3 factors: balance, fine motor skills, and flexibility
Lopes et al,[45] 2020	Nursing	The intrinsic abilities of the individual (physical, mental, and psychosocial abilities), the environment in which they live, and the interaction between the individual and this environment
Lučkin et al,[16] 2021	Nursing	The ability of a person to perform all daily activities ensures an adequate quality of life, including biological, psychological, and social functions
Kaushik et al,[46] 2020	Nursing	Grip strength, flexion, and extension range of motion
Martins et al,[47] 2020	Nursing	The confidence in the ability to perform the exercise
Memel,[2] 2008	Nursing	Physical function (ability to work, perform ADL, mental health, and social functioning
Okiljević et al,[48] 2017	Physiology	Ability to engage in regular physical exercise
Stankoviç et al,[49] 2019	Physiology	Ability to physically exercise
Paulsamy et al,[50] 2021	Nursing	Isometric and isotonic quadriceps contraction exercise
Qureshi et al,[28] 2021	Nursing	Quadriceps strengthening exercise
Fallatah et al,[51] 2021	Nursing	Ability to perform active range of motion exercises, flexed and extended neck slowly without holding at the end ranges
Sporis et al,[52] 2011	Nursing	Ability to walk on a platform
García-Garro et al,[53] 2020	Nursing	Verbal fluency, executive function, functional flexibility, and lower-body strength
Su et al,[15] 2021	Nursing	Cognitive, emotional, interpersonal, and physical functional abilities
Kim et al,[13] 2019	Nursing	Physical. psychological function, communication, and cognition
Tippett et al,[54] 2013	Nursing	Task performance and cognitive-motor integration abilities
Moreno-Agostino et al,[3] 2021	Nursing	Activities and participation (mobility, hand and arm use, self-care, sensory functioning, interpersonal relationships, cognition)
Migaj et al,[1] 2022	Medicine	Ability to perform everyday life activities that require specific endurance and physical fitness
Gravenstein et al,[6] 2024	Medicine	The subject's ability to perform everyday executive function tasks for independent living, and the associated availability of resources to complete the tasks

Abbreviation: ADL, activities of daily living.

Table 2. The Number of Articles That Occur in Each Attribute of the 38 Articles

Attribute	No. of Articles
Physical ability	38
Social ability	11
Psychological ability	7

Determining the Defining Attributes

Attributes of a concept are the features of the concept that appear repeatedly in the evidence.[55] Walker et al[26] explained that the attributes of a concept are the heart of concept analysis because this step was written to explain the group of attributes that are most frequently associated with the concept and that provide the analyst with a broader insight into the concept (Table 3).

Identifying a Model Case

According to Walker et al[26] the fifth step of concept analysis is the identification of a model case. A model case is an example of the use of the concept that shows all the defining attributes of the concept. For example, the model case is specified as follows:

Miss A, 55 years, patient with heart failure, enrolled to be treated in the heart failure clinic for 6 months. She goes to see the doctor at every appointment, takes medicines regularly, exercises at least 3-5 days per week, limits the amount of salty diet, and measures the fluid intake and output every day, including weight measurement. She walks across the footbridge to go marketing every day (physical ability). She goes to make merits at the temple on Buddhist holy days and talks to others about the development of the village after the completion of religious ceremonies (social ability). She feels happy to join with other people, and she is not worried about heart disease (psychological ability).

This model case includes all 3 important attributes: physical, social, and psychological abilities.

Identifying Additional Cases

The sixth step of concept analysis is identifying additional cases consisting of a borderline case, a related case, a contrary case, an invented case, and an illegitimate case.[26] The additional cases are as follows:

Borderline Case: This case is an example that contains most of the defining attributes of the concept being examined, but not all. An example is shown as follows:

Table 3. Attributes of the Functional Ability Concept

Attribute	Explanation
Physical ability	• Ability to do independent physical activity in daily living • Mobility • Ability to work
Social ability	• Ability to maintain relationships and engage in social activities • Interaction and communication with others • Participation in community activities
Psychological ability	• Feeling good • Less worry, stress, and depression. • Not feeling down

Mr. B is receiving care from the heart failure clinic for 1 month. Today, he has a follow-up at the clinic. A nurse provides him with a 6-minute walk test, and he can walk 700 meters without dyspnea with an oxygen saturation of 96% (physical ability). He can tell the dietitian the menu that he has eaten in the past week. Moreover, a psychologist found that over the last 2 weeks, he has also interested or pleased in doing things in daily life, and he has not felt down, depressed, or hopeless (Patient Health Questionnaire-2: negative) (psychological ability). On the other hand, his daughter said that her father didn't hang out with friends as often as before because he was tired (incomplete social ability).

In this case, there are proper physical and psychological abilities that are the most crucial attributes of functional ability, but the social ability is not complete.

Related Case: This case is also an instance of a concept that is related to the concept being studied but does not contain all defining attributes. The related case is similar to the model case but is not them.

Mr. C, 60 years, has congestive heart failure. He was hospitalized with volume overload, orthopnea, crepitation in both lungs and ankle edema. Chest x-ray shows pulmonary congestion and cephalization in both lungs, and echocardiography shows left ventricular ejection fraction of 35%. Today he feels comfortable and happy, talks with other patients in a friendly manner. In addition, his son helps Mr. C with his daily activities such as feeding, taking a bath, dressing, walking, and practicing hygiene because Mr. C sometimes gets exhausted.

Mr. C has a good quality of life that is similar to the concept of functional ability but he cannot do all activities by his own and there is suboptimal physical ability in this case.

Contrary Case: This case is a clear example of the functional ability concept.

Miss D, 55 years, diagnosed with heart failure for 10 years, is unable to walk, eat, take a bath, or dress by herself. She doesn't do anything, she wants to be alone, and she sometimes cries. Thus, today her daughter takes her to see a doctor. While she is waiting to see the physician, she has dyspnea, an oxygen saturation of 80%, respiratory rate (RR) of 32 breaths/minute, pulse rate of 90 beats/minute, and blood pressure of 90/60 mmHg. Then, she is intubated with mechanical ventilator setting of a pressure control mode, RR 12, positive end-expiratory pressure (PEEP) 5, fraction of inspired oxygen (FiO_2) 0.4, on fentanyl (10:1) rate 5 mL/hour, and the Richmond Agitation-Sedation score (RASS) -3 under sedative drug.

There are no significant attributes of the functional ability concept in this case because the case study cannot function in terms of physical, psychological, and social ability. Therefore, this situation is the opposite condition of the concept of functional ability.

Identifying Antecedents and Consequences

Identifying antecedents and consequences is the seventh step in a concept analysis of functional ability. Antecedents are those events that must have taken place prior to the occurrence of the concept. Consequences are incidents that occur as a result of the occurrence of the concept or the outcome of the concept, and they contain positive and negative outcomes for patients (Figure 1).[26]

Antecedents: Literature revealed several antecedents related to the concept of functional ability. These include musculoskeletal capacity and muscle strength,[5, 42, 45, 46, 48, 51, 52, 54, 55, 56] ability to move,[5, 28, 43, 45, 47, 48, 51, 54] good communication skills,[15, 21, 42, 44, 57] and good cognitive function.[13, 15, 44, 55]

Consequences: Consequences consist of positive consequences and negative consequences. The positive consequences include quality of life or well-being,[15, 16, 22, 38] good health status,[2, 5, 9-10, 12, 16, 21, 22, 33-34, 36-38, 40, 42, 43, 44, 46, 51] normal vital lung capacity, good disease prognosis, and good relationships.[15, 46, 48] While, depression,[2, 15] dependence,[12, 39, 42] fall,[5, 42, 45, 46, 48, 51, 52, 54, 55, 56] and hospitalization[25] are the negative consequences.

Defining Empirical Referents

The last step in a concept analysis is empirical referents which are categories of actual phenomena that, by their presence, demonstrate the occurrence of the concept itself. If we are to measure the functional ability concept, we must assess 3 attributes, including physical ability, social ability, and psychological ability (Table 4).

Figure 1. Antecedents, Critical Attributes, and Consequences of Functional Ability

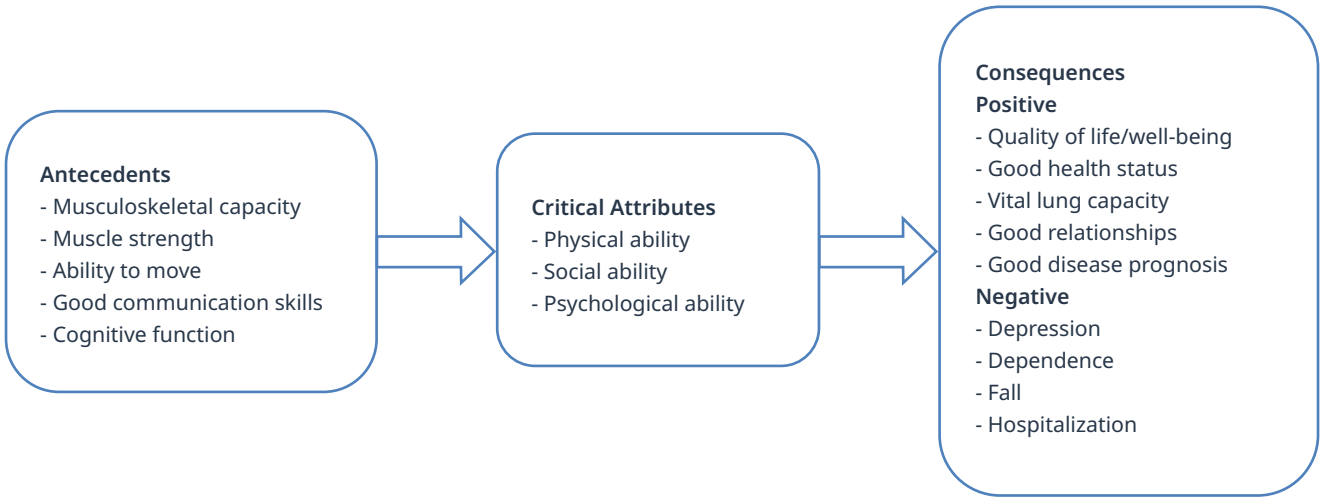

Table 4. The Empirical Referents of the Functional Ability Concept

Attribute	Empirical Referent
Physical ability	• Ask about physical activity in daily living, mobility, and work • Assess the patient's ability to perform daily activities, mobility, and work by using questionnaires • Assess patients' ability through methods created by the health care providers and observe the behaviors of the patients' instructions
Social ability	• Observe the behaviors of social activities, interaction, and communication with others • Assess the patient's ability to participate in social events by using questionnaires
Psychological ability	• Self-reported mood scales and clinical patient engagement and emotional expression observations • Mental health assessed by using standardized questionnaires

Instruments for Functional Ability Assessment

There are several instruments for the evaluation of functional ability. Most of the studies measure physical aspects of functional ability, consisting of the basic ADL,[9, 12, 22, 33, 35, 38, 43] instrumental ADL,[5, 6, 9, 12, 33, 38, 43, 54] Timed Up and Go Test,[11, 28, 47] Living Skills and Resources Revision 2,[6] Five Times Sit-to-Stand Test,[11] 6-minute walk test,[11] 10-meter walk test,[11] Functional Activities Questionnaire,[33] spontaneous behavior interview-basic activities of daily living (SBI-BADL),[9] Pfeffer Functional Activities Questionnaire,[34] Kujala score,[10] Michigan Hand Questionnaire,[46] Step Test,[47] Stage Balance Test Modified,[47] Lawton instrumental activities of daily living scale,[12, 37, 38] Care dependency scale,[37] Katz Index of Independence in ADL,[12, 37, 38, 42] and vital lung capacity.[48, 49] Physical ability and social abilities can be assessed by the Functional Independence Measures,[41] the Direct Assessment of Functional Status,[21] and the Health Assessment Questionnaire,[2] which assesses ADL. For social ability, the Activities and Participation Profile related to Mobility[47] and the Porch Index of Communicative Ability[43] can be used. In addition, the tools can be assessed for psychological ability are Mini-Mental State Examination for depression[37] and self-efficacy for exercise.[47]

In conclusion, the instruments can be used to measure all 3 critical attributes of concepts, including long-term care assessment evaluation, the 36-item Short Form Health Survey (SF-36) (use subscales),[15] and the WHO Quality of Life (use subscales).[36] Most studies measure functional ability only in the physical domain.[9, 10, 11, 12, 28, 33, 34, 35, 39, 42, 44, 46, 48, 49, 51, 53, 56] Furthermore, some literature found that the researchers used a combination of instruments to measure functional ability.[2, 15, 16, 21, 22, 37, 38, 41, 43, 45, 47, 54, 57]

Implications for Nursing Practice

Analyzing the concept of functional ability in older adults and patients with heart failure has excellent implications for the development of nursing knowledge and practice. Concept analysis of this concept provides a clear understanding of the meaning, attributes, antecedents, and consequences, including assessment of the outcomes of the concept. The findings are used to assess the physical and social abilities that indicate disease prognosis, quality of life, well-being, and health status. In addition, the clinical implications of this review can guide nurses in providing care interventions that improve the functional abilities of patients with heart failure.

Implications for Nursing Research

The implications of this report for research are that 1) this concept analysis can be used as a developmental instrument to directly measure functional ability for persons with heart failure, and 2) nursing interventions are needed to increase the functional ability of people with heart failure.

Conclusions

The concept of functional ability analysis produces the attributes of physical, social, and psychological abilities. These results provide a clearer understanding of the concept of functional ability in terms of meaning, antecedents, important attributes, consequences, and empirical referents that are significant in nursing. This concept analysis offers a valuable perspective on functional ability that guides the nursing profession and clinical research in providing better interventions to improve functional ability in

patients with heart failure. Moreover, the results of the analysis provide a definition and characteristics of functional ability that are useful for measuring nursing outcomes. In addition, it is also an advantage in the development of research tools.

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