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The road to successful geriatric rehabilitation

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CHAPTER 1

General introduction

Background

Due to the rising life expectancy and improved treatment possibilities of chronic illness and acute care, the group of older persons will continue to increase worldwide. Concurrently, the number of older people with multi-morbidities in acute care will also increase.[1] Patients in acute care with multi-morbidity have a higher risk for hospitalization and adverse outcomes such as hospitalization-associated disability.[2] About 30% of patients in acute care develop new disabilities in performing activities of daily living (ADL).[2] However, geriatric rehabilitation has a positive effect on the improvement of functioning after hospitalization, leads to less re-admissions to hospital and nursing homes, and to lower mortality rates. Therefore, geriatric rehabilitation is of great importance to this specific population.[3]

Geriatric rehabilitation is a relatively new and important emerging field in medicine and research. Historically, the majority of people failed to survive an acute illness so that rehabilitation was relatively rare.[4] Fortunately, due to related developments in medicine, geriatric rehabilitation started to develop. In 1947, the Lancet addressed this topic by reporting: *"…an active approach to the problem (deterioration because of hospitalization) more and more can receive treatment in bed preparatory to the restoration of assisted or unassisted ambulation….This can be achieved by geriatric rehabilitation". The aim of geriatric rehabilitation is to restore the maximum degree of painless movement by means of active physiotherapy and remedial exercises, resulting in the maximum of personal independence.*[5]

Geriatric rehabilitation consists of two main characteristics. First, geriatric rehabilitation is a multidisciplinary set of evaluative, diagnostic and therapeutic interventions with the purpose to restore functioning or enhance residual functional capacity in older people with disabling impairments.[6] Second, geriatric rehabilitation treatment has a multidisciplinary patient-centered approach. The population receiving geriatric rehabilitation is characterized by having a high burden of pre-existing multiple comorbidities.[4, 7, 8] Geriatric rehabilitation is indicated after acute care or an acute illness. In case of elective joint replacement, geriatric rehabilitation already starts in the preoperative phase.

The population receiving geriatric rehabilitation can be categorized into five main groups of medical diagnoses for geriatric rehabilitation: stroke, elective joint replacement (hip or knee), traumatic injuries, amputation, and a miscellaneous group with other diagnoses for rehabilitation (i.e. chronic obstructive pulmonary disease, heart failure, prolonged hospital stay after major surgery).

Geriatric rehabilitation: an international perspective

Internationally, post-acute care rehabilitation is provided in different settings. For example, in the USA post-acute care is provided in inpatient rehabilitation facilities (rehabilitation ward within a hospital), skilled nursing facilities (care-coordination

provided by a physician), long-term care hospitals, or by home health agencies. There is an overlap in types of patients treated in these different settings. In England, post-acute care is provided in community hospitals and care homes, and in New Zealand and Australia post-acute care is mostly provided by geriatricians in hospitals and in ambulatory settings. The heterogeneity in settings and organization of care makes it difficult to compare the outcomes of treatment in an international perspective.[9-11] Nevertheless, internationally, there is growing interest in how to organize and measure outcomes (e.g. functional measures, patient satisfaction, cost-effectiveness) of post-acute geriatric rehabilitation in order to improve patient outcomes.

Geriatric rehabilitation in the Netherlands

In the Netherlands, geriatric rehabilitation in the post-acute care setting developed within nursing homes. A descriptive study showed that, in 1988, half of the nursing home population in the Netherlands had a temporary residence.[12] This led to the development of the first Dutch nursing home to offer a geriatric rehabilitation ward (with 15 beds)[13] and with the aim to discharge home to the patient's former living environment. The Dutch nursing homes have now evolved into skilled nursing facilities with specialized knowledge on specific diagnostic groups. For example, skilled nursing facilities became part of integrated stroke services, and (elective) joint care and traumatic injuries services, in collaboration with university and general hospitals. In these skilled nursing facilities treatment is provided by a multidisciplinary team.

The multidisciplinary teams are led by an elderly-care physician, which is a unique concept in an international perspective. Elderly-care medicine is acknowledged as a medical specialty (with a training program of three years) and consists of training in geriatric, palliative and rehabilitation medicine.[14, 15] The multidisciplinary team consist of nursing staff, physiotherapist, occupational therapist, social worker, psychologist, speech therapist and dietician. When appropriate, other specialists such as a psychiatrist, psychomotor therapist, rehabilitation physician or orthotist/prosthetist, can be consulted.[16] The composition of the team is dependent on the patient's rehabilitation goals, which are described in rehabilitation treatment plans. The rehabilitation treatment plan is evaluated and adjusted during regular team meetings to coordinate the rehabilitation activities.

Aspects of successful geriatric rehabilitation

In this thesis we used the evidence-based Structure, Process and Outcomes (SPO) Donabedian framework to describe the various aspects of successful rehabilitation.[17] The SPO framework is used extensively in international research to describe and evaluate the quality of health care .[18] 'Structure' refers to the characteristics in which the care occurs. This includes facilities and equipment, organizational management, methods

of reimbursements, amount of team members, and expertise.[17] 'Process' specifies the actions that take place during patient care that affect patient outcomes, such as direct patient care processes, or the interaction of inter-professional processes such as team functioning and improvement processes.[9, 17] 'Outcome' refers to the effect of care on patients' health status. Because geriatric rehabilitation is focused on patient-centered care the most important aim of quality improvement in structure and process is to improve patient outcomes. The Donabedian framework addresses the aspects which are most important in improving quality of care. However, little is known about which specific elements or combination of elements contribute to successful geriatric rehabilitation in the post-acute care setting.

Geriatric rehabilitation has now developed to a stage where there is a need for quality improvement in order to further improve successful rehabilitation outcomes. However, there is still a lack of well-conducted studies focusing on i) quality improvement of geriatric rehabilitation, and ii) evaluating successful geriatric rehabilitation outcomes, such as discharge to home with a higher level of physical functioning, and optimizing the length of stay in skilled nursing facilities by improvement of the rehabilitation processes.

Aims of this thesis

The overall aim of this thesis is to investigate various aspects of the structure and processes in geriatric rehabilitation in relation to the outcome of successful rehabilitation.

The first part of this thesis examines the structure and process aspects of geriatric rehabilitation. Internationally, there is a strong focus on how to organize the structure of care in order to improve patient outcomes.[9] For example, in hospital care, patient volume is considered to be an important facilitator for quality and a proxy for specialization. However, only for complex high-risk treatment there is evidence that high volume is associated with better patient outcomes.[19] In addition, the concentration of services has shown positive results in stroke rehabilitation,[20] although large randomized controlled trials targeting geriatric rehabilitation are lacking.[3] Moreover, little is known about the actual numbers of patients using geriatric rehabilitation resources, and whether organizational characteristics (e.g. patient volume, service concentration) will benefit successful geriatric rehabilitation outcomes.[9, 21, 22] **Chapter 2** describes the association of patient volume and service concentration with successful geriatric rehabilitation, defined as short length of stay and discharge to home.

In the case of elective joint replacement, the geriatric rehabilitation process already starts before admission to the hospital by providing information about surgical procedures and postoperative therapy. Studies have focused on the preoperative predictors of postoperative functioning in patients with joint replacement.[23] Knowledge on preoperative predictors of successful rehabilitation is very important: e.g. more knowledge on the effects of preoperative functioning on rehabilitation outcomes can be used to

optimize care processes, such as timing discharge to home. The question arises as to whether we can measure preoperative functioning to predict functional outcomes of geriatric rehabilitation affecting patients' outcome. In patients with total knee replacement, preoperative quadriceps strength is associated with postoperative functioning,[24] whereas this has not yet been investigated in patients with total hip replacement. **Chapter 3** investigates which specific muscle groups of the lower extremities measured preoperatively are associated with short-term functional recovery after total hip replacement.

The second part of this thesis investigates initiatives to improve process and structure aspects with the aim to improve the outcome of successful geriatric rehabilitation. The overall organization of geriatric rehabilitation is a complex care process that suffers from fragmentation of care because of the many different specialists, professionals and settings involved. The geriatric rehabilitation pathway consists of acute care, post-acute care, outpatient or home rehabilitation, and home health care if needed. Good collaboration between the healthcare providers and professionals involved is essential for smooth transitions in care. Internationally there are attempts to improve the quality of the care processes, but these attempts did not specifically address geriatric rehabilitation patients and did not reflect the post-acute care setting.[9] In addition, little is known about the perspectives of professionals, patients and informal caregivers on the quality of care during these initiatives. The Dutch Ministry of Health, Welfare and Sport initiated a national program ('Proeftuinen geriatrische revalidatie') to improve integrated geriatric rehabilitation, with the aim to improve quality of care and health service delivery. **Chapters 4 and 5** describe the 'Synergy and Innovation in Geriatric Rehabilitation (SINGER) Study'. The SINGER study is a prospective longitudinal study performed during the implementation of this national program to improve quality geriatric rehabilitation care. **Chapter 4** addresses changes in the health services delivery process as experienced by professionals, patients and informal caregivers during the national program. **Chapter 5** describes the patient outcomes of the SINGER study in terms of successful geriatric rehabilitation, defined as independency in ADL and discharge to home after a short length of stay in the skilled nursing facility.

Early discharge planning is an important patient care process in geriatric rehabilitation that can affect patient outcome. If the patient is discharged to home in a timely fashion, this is considered to improve functional outcomes and reduce hospitalization rates, especially in patients with stroke and traumatic injuries.[25, 26] A pilot study in the Netherlands concluded that for 25% of the participating geriatric rehabilitation patients, earlier discharge was deemed possible.[27] In case a few nursing support tasks are required during the evening and night, these could be dealt with by a homecare provider or informal caregiver. Geriatric rehabilitation can then be continued with outpatient or home rehabilitation. However, no instruments are currently in place/available for this purpose.

In **Chapter 6**, in a quasi-experimental study (including a pre- and postimplementation cohort) we evaluated whether weekly scoring of a nursing support scorecard, and discussion within the multidisciplinary team, has the potential to lead to earlier discharge home.

Chapter 7 presents a general discussion on the main results of the studies. In addition, various aspects of successful geriatric rehabilitation are considered in a broader perspective, the methodological challenges and practical implications of the findings are addressed, and some recommendations are made for future research.

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PART ONE

Aspects of successful geriatric rehabilitation